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May 8, 2018

Mr. Sam Shiver
Environmental Specialist II
Florida Department of Health
Division of Disease Control & Health Protection
7551 Forest Oaks Boulevard
Spring Hill, FL 34606
Via email at Samuel.shiver@flhealth.gov

RE: **Level 2 Remedial Action Plan**
AA Discount
181 West Kings Highway
Center Hill, Sumter County, FL
FDEP Facility #: 60 / 8516863
Purchase Order #: B1F490 – Task 2
MAS Project #M50033

Dear Mr. Shiver:

MAS Environmental, LLC. (MAS) is pleased to provide you with the following Level 2 Remedial Action Plan for the above referenced location. The goal of the completed scope of work is to provide a remedial approach to address the remaining subsurface impacts and to provide the design specifications for the remedial system design.

Should you have any questions regarding this Remedial Action Plan, please, do not hesitate to contact us directly at (813) 658-8823 or via e-mail at tbennett@mas-env.com and rschroeder@mas-env.com.

Sincerely,
MAS Environmental, LLC

Robert Schroeder
Project Manager

Thomas H. Bennett, PE
Senior Engineer

Level 2 Remedial Action Plan

AA Discount
181 West Kings Highway
Center Hill, Florida
FDEP Facility #: 60 / 8516863

Prepared for:

Samuel Shiver
Environmental Specialist II
Florida Department of Health
Division of Disease Control & Health Protection
7551 Forest Oaks Boulevard
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Prepared by:

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Reviewed by:

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P.E. CERTIFICATION

AA Discount
181 West Kings Highway
Center Hill, Sumter County, Florida
FDEP FACILITY ID #: 60/8516863

Statement of Professional Review

I hereby certify that in my professional judgment, the components of this Level 2 Remedial Action Plan satisfy the requirements in accordance with Chapter 62-780 Florida Administrative Code (FAC), and the conclusions in this document provide reasonable assurances that the objectives have been met.

I, Thomas H. Bennett, P.E. 55559, certify that I currently hold an active license in the State of Florida and am competent through education or experience to provide the engineering service contained in this report. I also certify that MAS Environmental, LLC holds the active certificate of authorization # 29295 to provide engineering service.

Thomas H. Bennett, P.E.
Professional Engineer
Florida License No. 55559
Date: 05/08/2018
MAS Environmental, LLC
Certificate of Authorization 29295

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1.0 INTRODUCTION

1.1 General

This Remedial Action Plan (RAP) has been prepared for the AA Discount facility located at 181 West Kings Highway, Center Hill, Sumter County, Florida. The FDEP identification number for the site is FAC ID # 60/8516863.

2.0 SITE BACKGROUND

The site is an active petroleum gas station and convenience store located (**Figure 1**). Currently, the site consists of two (2) 10,000-gallon capacity underground storage tanks (USTs) that were installed in March 2008.

On December 9, 1993, a discharge was reported and the Site was placed in the Petroleum Liability and Restoration Insurance Program (PLRIP).

According to the FDEP Storage Tank Facility Closure Site Inspection Report (FDEP Tank Closure Report) dated March 12, 2008, the Site previously consisted of four (4) 6,000-gallon capacity USTs (FDEP registered as Tank Numbers 4, 5, 6 and 7). In a Source Removal Report dated May 8, 2008, on March 12, 2008 the previous USTs, associated piping and surrounding soils were excavated and removed. Approximately 155 tons of petroleum contaminated soils were removed from site in the 1500 square feet excavation area to a depth of 13 feet below land surface (bls).

According to the FDEP Storage Tank Facility Installation Site Inspection Report dated March 13, 2008, two new USTs were installed and consisted of one (1) 10,000-gallon capacity regular grade gasoline UST and one (1) 10,000-gallon capacity UST, divided with one (1) 6,000-gallon diesel fuel compartment and one (1) 4,000-gallon premium grade gasoline compartment. The newly installed UST is located on the northeast side of the property and the UST construction consists of double wall steel primary material and fiberglass secondary material. The USTs associated piping consists of double wall fiberglass material.

In January 2009, Site cleanup activities were paused when the FDEP priority score funding threshold was raised. In March, 2010 site cleanup activities were resumed. The site currently has a priority score of 56.

The site has been in Natural Attenuation Monitoring (NAM) since April 2012 and the groundwater monitoring activities were completed by MAS.

3.0 SUMMARY OF ASSESSMENT ACTIVITIES

The following sections describe the results of the historical assessment activities and of the most recent assessment activities conducted at this site. The assessment activities appear to have sufficiently identified the target areas that require remediation.

3.1 Lithology

One (1) soil boring was advanced during the pilot test wells installation activities to a depth of 45 feet bls before installation of air sparge well AS-1. Based on the information from the soil boring, and historical soil boring data, the site is underlain by sandy clay from 15 to 25 feet bls and soft clay from 27 to 45 feet bls. An increase in density was observed between 14 to 21 feet bls.

3.2 Soil Quality

Based on the most recent soil screening data, no soil impacts were noted within the vadose zone (**Figures 2 and 3, Tables 1, 2A-2C)**.

3.3 Groundwater Elevation and Flow Direction

Current and historical groundwater elevation summary data is provided in **Table 3**. **Figure 4** provides a graphical representation of the most recent data. Based on the top of casing elevations and the depth to water, the groundwater flow direction was inferred to be toward the west.

Groundwater has typically been observed fluctuating between 20 and 32 feet bls. Therefore, smear zone is estimated to extend vertically within that interval. In addition, the historical records do show that groundwater elevations rose above those typically seen in 2004.

3.4 Groundwater Quality

On June 23, 2017 groundwater samples were collected from existing monitoring wells. Laboratory analysis of the collected samples identified the presence of groundwater impacts at levels above their respective Groundwater Cleanup Target Levels (GCTLs) from monitoring wells MW-5I and MW-8I. Monitoring wells MW-5R and MW-8R have had less than (one) 1 foot of water or been dry on the two most recent sampling dates, however, the most recent analytical results from August 20, 2014 indicated several constituents of concern above GCTLs. The historical and the most recent groundwater analytical data are provided in **Tables 4A**, **4B**, and **4C** and depicted on **Figure 5**. The primary constituents of concern are the BTEX and MTBE.

The groundwater analytical results are older than 270 days, therefore, MAS recommends baseline prior to the construction activities.

3.5 Potable Water Considerations

A potable well survey dated August 25, 2015 included well information from the Florida Department of Health survey in the vicinity of the site. The well survey did not identify the presence of any small public or private supply wells within ¼ of mile radius of the site (**Appendix A).** The well survey identified the presence of two (2) large public supply wells within a ½ mile radius of the site.

4.0 SUMMARY OF PILOT TEST ACTIVITIES

On February 14, 2018, two (2) phases of the 8-hour soil vapor extraction (SVE) and air sparge (AS) test were conducted at the site using a mobile, trailer-mounted AS/SVE system provided by MAS.

Breakthrough pressure was noted at 27 pounds per square inch (psi). A flow rate of 2 cubic feet per minute (cfm) was deemed to be optimal and the observed pressure at the compressor was 26.5 to 27 psi. The highest pressure reading of 28.5 psi was observed at 6 cfm. The flow of 6 cfm was tested to evaluate whether higher flow rates would be achievable, however, the pressures observed were close to fracture pressure of approximately 31 psi and deemed inappropriate to continue testing. The Radius of Influence (ROI) was estimated to be 11 feet, for the given 43 to 45 feet bls screen interval, and the design depth to water of 20 feet bls.

During the SVE portion of the pilot test, a ROI of 15 feet was estimated. A minimum vacuum of 0.5 inches of water column (in wc) was observed at point 17.5 feet away from the SVE point, while vacuum of 0.3 in wc was observed 28 feet away from the SVE point. It should be noted that a preferential pathway most likely exists between the SVE and MW-8R wells. The SVE well was constructed with four-inch diameter Schedule 40 PVC pipe with screen interval between 15 and 25 feet bls. The SVE well was installed approximately one foot into the water table, however, no water was entrained during the pilot test activities. Approximately 20 cfm air flow was observed at 75 inches of water column vacuum, or 2 cfm per foot of well screen.

Based on the results of the pilot test, AS/SVE was deemed to be an appropriate technology for the site. The proposed specifications for the remedial action plan design are as follows:

- ROI for the SVE wells is 10 feet;
- ROI for the AS is 5 feet – conservative ROI is recommended for the RAP design;
- SVE wells to be constructed using 4-inch diameter PVC with screen interval set between 18 and 28 feet bls, to avoid short circuiting with the former excavation and disturbed soils;
- Sparge points to be constructed using 2-inch diameter PVC with screen interval set between 30 and 32 feet bls. During the pilot test, a pressure of 26 psi was observed for the 20 feet of water column, indicating significant backpressure introduced by lithology. Therefore, reduced depth is recommended for the RAP.

Based on the pilot test, and local lithology, the remediation system will provide medium to high vacuum, which will aid in desorption of the petroleum impacts, while air sparge component will operate at reduced, but sustainable flow rates.

5.0 CONTAMINATION MASS CALCULATIONS

Based on the groundwater sampling activities of 2017, groundwater impacts are limited to the southern edge of former excavation and dispenser islands **(Figure 5**). Based on the concentrations of petroleum constituents in the monitoring wells MW-5R, MW-5I, MW-8R, and MW-8I historically impacted wells and the rate of attenuation, the area of groundwater impacts is estimated at approximately 900 square feet (**Appendix B**). The dissolved mass was estimated as 0.01 lbs. Typically, the ratio of the mass of dissolved petroleum in the groundwater plume, to the total mass of petroleum constituents in all media (vadose soil, smear zone and dissolved groundwater plume) is 1 to 100. Therefore the total mass of petroleum constituents beneath the site is approximately 1 total pounds of contaminant mass.

6.0 REMEDIATION TECHNOLOGY FEASIBILITY ASSESSMENT

Various remediation technologies were evaluated to determine the most appropriate method to remediate the remaining dissolved-phase hydrocarbons present in the subsurface. The following remediation technologies were evaluated to determine the most effective remediation strategy: monitoring only (MO) or no further action (NFA), soil vapor extraction (SVE), air sparging (AS), chemical oxidation via hydrogen peroxide and/or ozone injection, high vacuum dual phase extraction (HVDPE), biosparging (BS), and excavation, transportation, disposal and restoration. These technologies are described briefly below.

6.1 Monitoring Only or No Further Action

If the vadose zone soil is neither a risk to the public health nor a source contributing to groundwater contamination, soil remediation may not be required. When the affected vadose zone soil is covered by an impervious surface (i.e. buildings, driveways, etc.), the public is not at risk of direct exposure. Therefore, active soil remediation may only be required if the underlying groundwater is affected or if the petroleum hydrocarbon concentrations exceed SCTLs per Chapter 62-777, FAC.

Vadose zone MO is achieved by monitoring the concentration of dissolved petroleum hydrocarbons in the groundwater over time. If a noticeable increase in the groundwater concentrations is observed in any particular area of the site, the vadose zone in that area should be re-assessed to estimate whether a previously unidentified source of dissolved hydrocarbons exists. In contrast, if the groundwater concentrations in the monitoring wells show a steady decrease over time due to remediation, NFA can be proposed. The site has been in monitoring only for approximately six (6) years with no varying concentrations of hydrocarbons over time.

6.2 Soil Vapor Extraction

SVE is a commonly utilized remediation technique for the treatment of impacted soil in the vadose zone. SVE systems utilize blowers to apply vacuums at extraction wells, allowing for the recovery of soil vapors from unsaturated soils. As air moves through soils in the vadose zone, volatile organic compounds (VOCs), including adsorbed-phase hydrocarbons, are transferred into the vapor stream for recovery. SVE systems also promote aerobic bioremediation due to the introduction of oxygen into subsurface soils. Typically, SVE systems effectively remediate compounds that have high vapor pressures (>1 millimeter of mercury) or that are aerobically biodegradable. However, utilizing SVE without groundwater pumping or air sparging has not proven effective for sites with impacts in the saturated zone.

6.3 Air Sparging

During air sparging, compressed air is injected into wells that are screened below the water table. Air bubbles travel upward and outward in the aquifer, resulting in the mass transfer of adsorbed and dissolved VOCs into the vapor stream. The sparged air stream becomes VOC laden as it travels upward toward the surface. Typically, air sparge systems are used in conjunction with SVE systems, so the sparged vapors can be recovered for treatment. Air sparging is most effective at sites with volatile contaminants and a permeable aquifer matrix.

6.4 Chemical Oxidation via Hydrogen Peroxide, Ozone, and/or Air Injection

The chemical oxidation process uses an injection pump to dispense a known volume and concentration of hydrogen peroxide and/or ozone into the subsurface through injection points (such as air sparge wells). During the process, hydroxyl radicals, which are powerful oxidizers, are formed. The exothermic oxidation process breaks down petroleum hydrocarbons in the groundwater into the by-products of carbon dioxide, and water. Hydrogen peroxide and ozone addition is viable at sites with moderate hydrocarbon impacts in the groundwater. Low pressure air injection can be utilized in conjunction with hydrogen peroxide and ozone injection to aid in dispersing the chemicals and provide additional oxygen for enhanced biodegradation of hydrocarbons.

6.5 High Vacuum Dual Phase Extraction (HVDPE)

High vacuum dual-phase extraction (HVDPE), also known as multi-phase extraction or vacuum-enhanced extraction systems use recovery wells to recover groundwater, soil vapors, and separate phase hydrocarbons (SPH) through a recovery well. The recovery well is connected to a high-vacuum blower through a piping network. A high-vacuum blower should be able to produce a vacuum up to 28 inches of Mercury (Hg) on each DPE well. The actual vacuum observed is inversely related to the vapor flow rate and dependent on the characteristics of the surrounding soil. The vapor that is drawn through the soil profile removes VOCs from the unsaturated soil pore spaces while Figure in clean air from non-impacted areas. This process volatilizes VOCs from the impacted soil and increases the available oxygen within the subsurface. HVDPE enhances the recovery of groundwater and SPH due to the high vacuum that increases the pressure gradient towards the recovery well. HVDPE allows for the remediation of adsorbed VOCs from the below the static water table via the simultaneous recovery of groundwater and soil vapors. HVDPE also provides hydraulic control.

6.6 Biosparging

The intent of biosparging is to increase dissolved oxygen concentrations in the subsurface to increase the rate of biodegradation. Oxygenation of the subsurface is accomplished by the injection of air/oxygen into the saturated zone. The ability of these techniques to enhance oxygen concentrations in the subsurface has been proven effective in the remediation of petroleum hydrocarbon-impacted soil and groundwater at sites with suitable soil conditions, and can be implemented individually or in combination with other technologies.

6.7 Excavation, Transportation, Disposal, and Restoration

Excavation involves the physical removal of petroleum impacted soils. If soils are unstable, the extent of hydrocarbons is vertically and horizontally extensive, and/or the impacted soils are beneath permanent structures (buildings, parking structure), it may not be cost effective to excavate. Disposal simply involves transporting the excavated soil to a landfill or some other type of permitted disposal facility (i.e. thermal treatment facility, solid waste landfill, etc.).

6.8 Remediation Technology Selection

MAS determined the appropriate technology to propose through review of the available site data and recently completed pilot test. Based on the site specific conditions, MAS recommends the use of SVE with AS to remediate the hydrocarbon constituents identified beneath this site. Based on the historical and current hydrocarbon concentrations in the groundwater, the lack of evidence indicating the presence of free product, the size and orientation of the hydrocarbon plume, site-specific lithology, current site conditions/use and the need for a remediation approach to minimize cleanup time, this appears to be the most cost effective approach.

7.0 TREATMENT SYSTEM DESIGN

7.1 Conceptual Design

Based on nature of groundwater impacts and local lithology, AS/SVE has been selected as the primary technology to remediate the petroleum impacted groundwater identified at the subject site. Other factors were also considered such as soil permeability, volatility of the compounds, and other site features and local infrastructure.

Due to the identified lithology and the results of the pilot test, the remediation system will use a medium to high vacuum vapor extraction component, with a lower volume air sparging component to remediate the petroleum impacts.

7.2 Treatment System Layout and Design

MAS proposes to install 13 air sparge wells (AS-1R, AS-2 through AS-13) onsite. Due to the depth of AS-1, it will not be integrated into the remediation system. The 13 new air sparge wells will be utilized to facilitate the volatilization of dissolved phase hydrocarbons, and the stripping of petroleum constituents adhered to soil particles, in the plume area with the highest concentrations at the site. The treatment system will utilize six (6) soil vapor extraction wells, proposed to be designated SVE-1 through SVE-6. The remediation system installation would include the installation of five (5) SVE wells (SVE-2 through SVE-6) and the use of the existing SVE-1. The vapor extraction wells are proposed for the capture of hydrocarbon vapors as they are volatilized from the groundwater by the AS wells. SVE well locations were chosen based on the current site features, such underground lines and proximity to landscaping.

Each AS and SVE well will be piped separately to the equipment compound to allow for system control and operational flexibility.

The proposed remedial system compound will be located to the west side of the building on site, near the southwest corner of property. This location is proposed to accommodate local traffic and is located within a landscaped area.

The proposed locations of the system wells are illustrated on **Figures 6, 7, and 8**. **Figure 9** illustrates the proposed trench layout. Trench plates will likely be required during the system trenching to allow for the use of the site during the system installation.

The proposed system location is outside of the facility's general traffic pattern and relatively close to the remediation wells and electric supply. Because the proposed trailer location is very close to the neighboring properties, the trailer will be provided with silencers, penetration hoods and wall insulation as noise attenuation measures.

7.3 Basis for Design

The following parameters were used for remedial system design, based on our experience at sites with similar lithology and the recently completed pilot test (**Appendix B**):

	REMEDIATION SYSTEM DESIGN PARAMETERS					
	Pressure / Vacuum at Compressor/ Blower	Pressure / Vacuum at well head	Number of Wells	Flow Rate (cfm/per well)	Total System Flow Rate (cfm)	Radius of Influence (ft)
SVE System	128.6 in. w.c.[1]	75	6	20 cfm	120 cfm	10
AS System	31.42 psi[2]	23.13	12	2 cfm	24 cfm	5

[1]Vacuum required at blower to achieve 75 inches of water column (in w.c.) vacuum at each SVE well (factoring friction and pressure losses through system.) Additionally, this pressure will allow the vacuum blower to accommodate the maximum demand at 75% of capacity.

[2]Pressure required at air compressor to achieve 2 cfm at each AS well (factoring friction losses through system). Additionally, this pressure will allow the compressor to accommodate the maximum demand at 75% of capacity.

Air Sparge Wells

The design area of influence for the sparge system was determined based on pilot test observations. Based on the pilot test, operational pressure was observed at 26.5-27 psi. It is expected that reduced pressure will be required with the recommended well screens set to a more shallow depth.

MAS proposes to install thirteen (13) new sparge wells (AS-1R through AS-13). The air sparge wells will be installed to a total depth of 32 feet below grade and will be constructed using 2-inch diameter Schedule 40 PVC with 2 feet of 0.010-inch slotted screen threaded to 30 feet of solid riser. Construction details for the air sparge wells are illustrated on **Figure 10**.

Soil Vapor Extraction Wells

SVE was designed using a vacuum influence 10 feet for the source area. As such, a SVE ROI of 10 feet was selected to provide vapor capture over the treatment area based on conservative approach. The combined influence of the points should also exceed the design influence for each individual point, thereby providing additional coverage of the impacted area. Calculations have been included in **Appendix B**. A SVE well detail diagram is presented on **Figure 11**.

MAS proposes to install 5 new vapor recovery wells (SVE-2 through SVE-6). The SVE wells will be installed to a total depth of 28 feet below grade and will be constructed using 4-inch diameter Schedule 40 PVC with 10 feet of 0.020-inch slotted screen threaded to 18 feet of solid riser. Construction details for the SVE wells are illustrated on **Figure 11**.

7.4 Air Sparge System Equipment Selection and Operation

Based on the pilot test activities and depth to water during the pilot test (approximately 24 feet bls), backpressure exerted due to lithology was estimated at 18.83 psi (**Appendix B**). Therefore, this estimate is utilized in the further design.

Based on the calculation below (and a riser length of 30 ft, total well depth of 32 ft), the air sparging system should be operated at a minimum of 4.3 psi + backpressure due to lithology at the injection wellheads. This value represents the minimum pressures necessary to overcome hydrostatic pressure and the formation resistance at each well. The calculations are based on the following equation (Leeson, et al, 2002):

$P_{minimum}$ (psig) = 0.43 H

Where H = 10 feet, the depth below the static water table surface (approximately 20 feet) to the top of the injection well screen (ft).

$P_{minimum,\ AS\text{-}13}$ (psig) = 0.43 * (10)
$P_{minimum,\ AS\text{-}13}$ (psig) = 4.3 psig at the well head

Taking into account friction losses, backpressure, the minimum necessary system pressure (measured at the compressor) to overcome hydrostatic pressure and friction losses is estimated to be 31.42 psi (see the air compressor design calculations in **Appendix B**). For design purposes additional 18.83 psi were added to the total estimate.

Additionally, the following equation is utilized to calculate the pressure at which significant fracturing of the aquifer can occur and at which the air injection should not be operated above:

$P_{fracture}$ (psig) = 0.73 D

Where D = 30 feet, the depth below ground surface to the top of the air injection well screened interval (ft).

$P_{fracture,\ AS\text{-}13}$ (psig) = 0.73 * (43)
$P_{fracture,\ AS\text{-}13}$ (psig) = 21.90 psig

Therefore, 21.9 psig is the maximum pressure at the wellhead in which air should be injected into the aquifer. The air injection system will typically be operated above 21.9 psi at the well head. Taking into account friction losses, the maximum required system pressure measured at the compressor is estimated to be 31.42 psi (see the air compressor design calculations in **Appendix B**).

Pilot Test activities indicated that breakthrough pressure was 27.5 psi. Based on these calculations an Ingersoll Rand UP6-7.5, 7.5 horsepower (HP) rotary screw compressor (or equal) will provide air for the sparge system (**Appendix B**). The compressor is capable of providing a maximum pressure of 125 psi and a maximum flow of 28 cfm. The AS wells will be operated at an injection rate of 2 cfm per well, and the pressure regulator on the compressor will limit the pressure at the wells to less than the fracture pressure. The compressor will be connected to a twelve (12) pipe manifold with each AS well operated by a dedicated manual control valve. The proposed manifold configuration will provide maximum operational flexibility by allowing any combination of air injection points to be in operation at any given moment. Operating flows and pressures at each sparge point will be monitored by dedicated pressure gauges and flow meters. The compressor will be equipped with a single-phase motor and inlet filter/silencer.

The AS compressor will be deactivated in the event of an SVE blower failure or shutdown. **Appendix B** contains sparge system friction loss calculations. The air compressor and associated equipment will be located in the proposed equipment compound, as illustrated on **Figure 9**. A process and instrumentation diagram and a legend for the air injection system are provided in **Figures 12 and 13**.

7.5 Soil Vapor Extraction Equipment Selection and Operation

Based on our experience at similar sites, a system design flow rate of 120 cfm may be expected during operation of the SVE system. The 10 feet radius of influence for the vapor extraction system includes the 10 feet radius of influence identified for the AS wells. The SVE design and friction loss calculations are provided in **Appendix B**. A Roots, URAI 53 frame (or equivalent), 10-HP positive displacement blower was selected based on system flow rate and system friction loss calculations. The blower will be equipped with a single-phase TEFC motor, inlet filter/silencer, and a moisture separator with a high level alarm and a vacuum relief valve.

The SVE blower will be connected to a 6 pipe manifold (6 active wells) with each SVE operated by a manual control valve. Sample ports, control valves and vacuum gauges will be fitted to each individual pipe to provide maximum system performance data and operational flexibility. The SVE blower and associated equipment will be housed in a secure trailer. Manufacturer specifications for the blower have been included in **Appendix B**. A process and instrumentation diagram for the soil vapor extraction system is provided as **Figure 14**. The diagram legend for all system processes and instrumentation diagrams is included as **Figure 13**.

Stub-up details, compound layout, electrical drop and tie down details are provided in **Figures 16, 17 and 18.**

7.6 Soil Vapor Extraction System Off-Gas Treatment

Petroleum concentrations in the vapor stream are expected to drop during the system operation. In accordance with 62-780 FAC, air emissions controls are required for the first 30 days of operation.

Based on the groundwater concentrations, it is estimated that 0.02 pounds of mass are expected to be recovered per day, given the flow of 120 cfm. Concentrations typically decrease rapidly. Calculations of carbon usage are provided in **Appendix B.**

Extracted vapors are proposed to be treated with two (2) vapor phase granular activated 200 lbs carbon units (GAC) vessels in series. Off-gas treatment technologies capable of treating high mass flow rates of recovered mass more efficiently (such as catalytic oxidizers or thermal oxidizers) will not be required.

The carbon media in the vapor filtration drums reaches saturation after removing petroleum mass approximately equal to 10% of the carbon mass. Each 200 lb drum should have the capacity to remove approximately 20 lbs of petroleum vapors. The first vessel may need to be changed following 216 days of the system operations.

Throughout the operation of the system air samples of the influent and effluent will be collected for analysis with EPA Method 18 to determine total VOC concentrations. The VOC analytical results will be used to calculate the mass of VOCs recovered per day based on the measured air flow rate. Air analytical data will be utilized to ensure that the hydrocarbon emission rate remains below the 13.7 lbs/day.

7.7 Effluent System Groundwater Discharge Monitoring

Due to the observed depth to groundwater at the facility, the SVE system is not expected to entrain groundwater, although minimal entrainment is expected based on the average moisture of the air, expected rainy season and a seasonal elevated water table. In the event that groundwater is recovered through the SVE system, it will be treated using liquid phase carbon. Groundwater will be transferred through the carbon vessels using the transfer pump and discharged into the infiltration gallery installed inside the compound. The construction drawing for the infiltration gallery is presented in **Figure 15.**

The gallery will be 3’ x 3’ x 12’ in dimension. The gallery will be constructed of 10 feet of 4” 0.020” slot screen installed within the top foot of #57 stone (no limestone), which has demonstrated positive characteristics in the past when used in this capacity. Filter fabric will line the sides and top of the gallery. The screen will be capped on one end with a slip cap, and the other end will be attached to 2 feet of solid pipe, connected to a 90-degree elbow and a riser, extending through a 12” manhole. The gallery access will be terminated with a female adapter and a threaded plug. The existing conditions of the surface will be restored. Construction details for the infiltration gallery are illustrated on **Figure 15**. The transfer pump will be controlled by the level switches in the moisture separator and the level switch at the infiltration gallery. The level control switches are depicted on the Soil Vapor Extraction Process and Instrumentation Diagram (**Figure 14**).

Under normal operations, the level switches in the moisture separator will operate the transfer pump. The LSH (level switch high) will activate the pump, which will transfer the collected water through the carbon to the gallery and the LSL (Level Switch Low) will deactivate the transfer pump. Under abnormal conditions, the system would collect water faster than the transfer pump can transfer it to the gallery, and the LSHH (Level Switch High, High) would activate and shut the SVE system down.

MAS does not anticipate extracting more than 0.25 gallon per minute, treating the groundwater and discharging the treated groundwater to the gallery. The proposed flow rate will be accommodated by the proposed discharge method. Calculations are provided in **Appendix B**. The sampling schedule is summarized in **Appendix C.**

8.0 TREATMENT SYSTEM STARTUP, OPERATION, AND MAINTENANCE

Periodic monitoring and maintenance of the air sparge/vapor extraction system is essential to ensure that the systems are performing efficiently. The implementation of this RAP will include a monitoring and maintenance schedule. This schedule will include an initial system startup, an optimization phase (weekly visits during the first month of operation), and regular monitoring and maintenance. The equipment will be enclosed with fence equipped with awareness signs.

8.1 System Startup and Optimization

System startup and optimization will be performed during the first week of system operation. Prior to system startup all remedial system components will be inspected to ensure that safe and proper installation has been completed. During system startup each system component will be operated across its respective performance range to confirm equipment operating capabilities. Startup testing will be conducted in accordance with the manufacturer's recommendations.

The vapor extraction system will be activated and tested prior to initiation of air sparging activities to ensure that sufficient influence is being achieved. Radial influence will be determined by measuring the induced vacuum at the nearby monitoring or observation wells, including wells MW-5R, MW-5I, MW-8R, MW-8I, MW-12, MW-13, MW-21D, OB-1, and OB-2. Based upon the applied vacuum observed at the manifold and extraction wellhead, the operational ROI of the system can be calculated. If this ROI is less than the design predictions, operation of the system may be modified to improve its overall capture. Readings of vapor concentrations and vacuum will be taken through a sample port on each individual manifold leg using a PID. Flow rates will be measured at the manifold with differential pressure gauge installed in-line and compared to interpolation graph.

After the vapor extraction system has been evaluated, the air sparge system will be operated at the design flow rates. Vacuum influence readings will again be taken to verify that capture is maintained. During this period soil vapor hydrocarbon concentrations and recovery rates will also be confirmed. When capture can be maintained and hydrocarbon recovery rates are appropriate for the off-gas treatment selected, the air sparge system will be operated.

The hydraulic influence of the sparging system will be confirmed during startup operations to optimize the system performance. Adjustments will be made to the sparging rate if excessive mounding or hydrocarbon vapor concentrations are observed.

Weekly site visits will be performed during the first month of remedial actions to ensure proper equipment operation and to evaluate and adjust system operating parameters.

8.2 Routine Maintenance and Operation

Monthly site visits will be performed during treatment system operation. During each site visit the following routine maintenance activities will be performed:

- The filters for the air compressor and the vapor extraction blower will be inspected and cleaned or replaced as required;
- The moisture separator will be cleaned and drained as required;
- The moisture separator vacuum relief valve will be inspected for proper operation;
- The compressed air system pressure relief valve will be inspected for proper operation;
- The aboveground piping system will be inspected for leaks and cracks;
- The system well heads will be inspected for leaks or cracks in the piping.

8.3 Permits

All permits shall also be obtained as necessary from the following regulatory entities:

- Sumter County
- State of Florida
- Florida Department of Environmental Protection

9.0 REMEDIATION MONITORING, SAMPLING, AND REPORTING

9.1 Air Sparge/Soil Vapor Extraction System Monitoring and Sampling

Vapor extraction system monitoring will include vacuum and flow measurements for each extraction well and in-situ vacuum measurements at the existing monitoring wells selected. Total system flow rates and hydrocarbon mass removal rates will also be calculated.

Vapor extraction off-gas sampling will be performed during each routine site visit to ensure that recovered vapors are below maximum discharge rates. Vapor sampling will be accomplished in the field by screening air samples from each active extraction point, the combined system influent, and the effluent of the off-gas treatment system.

Vapor samples will also be collected from the influent, mid-carbon and effluent of the off-gas treatment for subsequent laboratory analysis. Sampling for BTEX and total petroleum hydrocarbons will be achieved by filling Tedlar bags with vapor extracted from sample ports situated before and after the carbon. The bags will be forwarded to a laboratory for subsequent analysis in accordance with EPA Method 18. Vapor samples will be collected during the first three days of startup activities, weekly for the first month, monthly for the first quarter and quarterly thereafter, Mass removal will be calculated from the analytical results and vapor flow rate to estimate mass removal and predict carbon usage. Effluent sampling and analysis will continue for a minimum of three months after termination of SVE off-gas treatment.

Air sparge system monitoring will include flow and pressure measurements for each AS well, groundwater elevation and DO measurements at the observation wells. This data will provide documentation of groundwater mounding and verify the estimated 5 foot sparge radius of influence.

The effluent water generated by SVE system will be sampled during the first three days or as accumulated, whichever comes first and analyzed using rush turnaround for BTEX/MTBE and PAHs. The sampling schedule is summarized in **Appendix C.**

9.2 Groundwater Monitoring and Sampling

Groundwater quality data from the selected monitoring wells will be used to document remediation of the dissolved hydrocarbons. The data will also be used to adjust air injection quantity and flow rates as necessary to focus remedial action on any areas of concern. Groundwater samples will be collected from monitoring wells MW-5R, MW-5I, MW-8R, MW-8I, MW-12, MW-13, MW-21D, OB-1, and OB-2 on quarterly basis. The proposed groundwater monitoring and sampling and milestones schedule is provided in **Appendix C**.

9.3 Reports

A system installation and startup report will be submitted to the FDEP within 60 days of completion of the treatment system installation and startup tasks. This report will include a summary of the system shakedown results and operating parameters. A set of signed and sealed as-built Figures will be included with the startup report.

Quarterly progress reports will be prepared and submitted to the FDEP within 45 days of the end of each quarter of remedial actions. These reports will describe the progress achieved in the preceding reporting period and will contain the following items:

- A brief summary of the progress and operating effectiveness of the remedial system.
- A brief summary of system operating parameters and adjustments.
- An evaluation of system influence.

- Total estimated mass of VOCs treated.
- Tabular and graphical results for groundwater quality data, water level data and system influence.
- Recommendations for modifying the groundwater monitoring program, if appropriate.
- Recommendations for future remedial actions or modifications, if necessary.

Reports will be prepared in accordance with guidelines set forth under Chapter 62-780, FAC.

10.0 CLEANUP TIME, COST ESTIMATE, AND PAY-FOR-PERFORMANCE

10.1 Cleanup Time

The *Air Sparging Model of Predicting Groundwater Cleanup Rate* (Sellers & Schreiber, 1992) was used to predict the cleanup timeframe for BTEX and naphthalenes impacts identified at the site.

Diffusion coefficients in water for some chemicals are tabulated, and others can be estimated from empirical relationships (Bird et al., 1960). Given the approximate nature of this theoretical analysis and the observation that many diffusion coefficients in water fall in the range of 1 to 2 x 10^{-5} cm^2/s, the ratio of diffusion coefficients in water can be treated as unity (Bruce et al., 2000), and the model can be used to evaluate cleanup time for multiple chemical parameters.

This model yields an estimate of 0.2 years to achieve cleanup of benzene in groundwater at the site. Calculations are provided in **Appendix B**. However, based on the historical data, nature of the contaminants and unknown concentrations of petroleum constituents near or beneath the building, MAS estimates that the cleanup will be achieved in 0.5-years, based on our experience with similar site and petroleum constituents. RAP Summary is provided in **Appendix D.** UIC form is provided in **Appendix E.** Construction schedule is provided in **Appendix F.**

The cleanup goal for the site is GCTLs per Chapter 62-780, FAC.

10.2 Cost Estimate

The following generalized cost estimate for implementation of the RAP has been prepared as required by Chapter 62-780, FAC. The following is a cost breakdown for the system installation and operation for a duration of one year:

Task #	Assumptions	Costs
Task 1: Office Activities, permitting		$3,000
Task 2:	• Baseline Sampling	$2,500.00
Task 3:Well Installation, Trenching, Startup	• Installation of AS and SVE wells; • Trenching; • Removal of concrete/asphalt;	$70,000

	• Baseline sampling: 10 wells for BTEX/M, PAHs,;	
Task 3: 1st Quarter of Operation and Maintenance	• System Installation and Integration; Startup; 3 days of air (infl and effl) and water (effluent) sampling; • Electric Pole and utility connection (excludes utility pay) • 1st Quarter: monthly visits	$25,000
Task 4: 2nd quarter of O&M		$25,000
TOTAL (includes 10% safety factor):		**$138,050.00**

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

BORING NO.	SAMPLE DATE COLLECTED	SAMPLE INTERVAL (ft bls)	OVA SCREENING RESULTS TOTAL READING (ppm)	CARBON FILTERED (ppm)	NET READING (ppm)	SOIL BORING DESCRIPTION
SB-1	9/14/2005	1	BDL	BDL	BDL	silty sand, fine to very fine grain, qtz, organics,drk brn
		2	BDL	BDL	BDL	dark brown, silty sand, qtz, organics
		3	BDL	BDL	BDL	light brown, silty sand, qtz,augular to sub augular
		4	BDL	BDL	BDL	light color silty sand, very augular to augular
		6	BDL	BDL	BDL	clayey sand, rust staining, dark orange brown
		8	BDL	BDL	BDL	sandy clay, browninsh gray, iron staining
		10	BDL	BDL	BDL	sandy clay, iron rust staining
		12	4	BDL	4	light gray, sandy gray
		14	BDL	BDL	BDL	very fine silty sand, clay stringers, orange rust color
		16	2	BDL	2	sandy clay, iron staining, brownish gray
		18	BDL	BDL	BDL	sandy clay, iron staing, some limstone, light gray
		20	BDL	BDL	BDL	silty clay with limstone, light gray
		22	1	BDL	1	silty clay with limestone
		24	BDL	BDL	BDL	silty clay,iron staining, extra limestone, greenish gray
SB-2	9/14/2005	1	0.5	BDL	0.5	silty sand, fine to very fine grain, qtz, organics,drk brn
		2	BDL	BDL	BDL	dark brown, silty sand, qtz, organics
		3	BDL	BDL	BDL	light brown, silty sand, qtz,augular to sub augular
		4	BDL	BDL	BDL	light color silty sand, very augular to augular
		6	1	BDL	1	clayey sand, rust staining, dark orange brown
		8	BDL	BDL	BDL	sandy clay, browninsh gray, iron staining
		10	BDL	BDL	BDL	sandy clay, iron rust staining
		12	BDL	BDL	BDL	light gray, sandy gray
		14	BDL	BDL	BDL	very fine silty sand, clay stringers, orange rust color
		16	3	BDL	3	sandy clay, iron staining, brownish gray
		18	BDL	BDL	BDL	sandy clay, iron staing, some limstone, light gray
		20	BDL	BDL	BDL	silty clay with limstone, light gray
		22	4	BDL	4	silty clay with limestone
		24	BDL	BDL	BDL	silty clay,iron staining, extra limestone, greenish gray
SB-3	9/14/2005	1	BDL	BDL	BDL	silty sand, fine to very fine grain, qtz, organics,drk brn
		2	2	BDL	2	dark brown, silty sand, qtz, organics
		3	BDL	BDL	BDL	light brown, silty sand, qtz,augular to sub augular
		4	BDL	BDL	BDL	light color silty sand, very augular to augular
		6	BDL	BDL	BDL	clayey sand, rust staining, dark orange brown
		8	BDL	BDL	BDL	sandy clay, browninsh gray, iron staining
		10	BDL	BDL	BDL	sandy clay, iron rust staining
		12	BDL	BDL	BDL	light gray, sandy gray
		14	2	BDL	2	very fine silty sand, clay stringers, orange rust color
		16	BDL	BDL	BDL	sandy clay, iron staining, brownish gray
		18	BDL	BDL	BDL	sandy clay, iron staing, some limstone, light gray
		20	BDL	BDL	BDL	silty clay with limstone, light gray
		22	BDL	BDL	BDL	silty clay with limestone
		24	BDL	BDL	BDL	silty clay,iron staining, extra limestone, greenish gray
SB-4	9/14/2005	1	50	1	49	silty sand, fine to very fine grain, qtz, organics,drk brn
		2	1	BDL	1	medium brown, silty sand, qtz, organics
		3	1	BDL	1	light brown, silty sand, qtz, sub angular
		4	BDL	BDL	BDL	light color silty sand, very angular to angular
		6	BDL	BDL	BDL	clayey sand, rust staining, dark orange brown
		8	BDL	BDL	BDL	sandy clay, browninsh gray, iron staining
		10	BDL	BDL	BDL	sandy clay, iron rust staining
		12	1	BDL	1	light gray, sandy gray
		14	BDL	BDL	BDL	fine silty sand, clay stringers, orange rust color
		16	2	BDL	2	sandy clay, iron staining, brownish gray
		18	BDL	BDL	BDL	sandy clay,moderate iron staing, some limstone, light gray
		20	BDL	BDL	BDL	silty clay with limstone, light gray
		22	1	BDL	1	silty clay with limestone pebbles
		24	BDL	BDL	BDL	silty clay,iron staining veins, extra limestone, greenish gray

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

BORING NO.	SAMPLE DATE COLLECTED	SAMPLE INTERVAL	OVA SCREENING RESULTS TOTAL READING	CARBON FILTERED	NET READING	SOIL BORING DESCRIPTION
SB-6	9/15/2005	1	BDL	BDL	BDL	med brn, silt sand sng-sub ang, med sort, orgs, qtz
		2	BDL	BDL	BDL	med brn, silt sand sng-sub ang, med sort, orgs, qtz
		3	BDL	BDL	BDL	med brn, silt sand sng-sub ang, med sort, orgs, qtz
		4	BDL	BDL	BDL	med brn, silt sand sng-sub ang, med sort, orgs, qtz
		6	BDL	BDL	BDL	lgt brown silt sand, ang-sub ang, med sort, qtz
		8	BDL	BDL	BDL	dk gry orange, silty sandy clay, signif iron stain
		10	1	BDL	1	dk gry orange, silty sandy clay,
		12	BDL	BDL	BDL	med gry sandy clay
		14	BDL	BDL	BDL	med gry silty sandy clay, some iron stain
		16	5	BDL	5	lgt gry sandy clay some iron stain
		18	>5000	BDL	<5000	lgt gry silty clay some iron stain
		20	2600	BDL	2600	lght gry & orang silty sandy clay signif iron stain
		22	4400	BDL	4400	lght $ dk gry silty clay some iron stain
		24	4300	BDL	4300	lgt gry silty sandy clay lmstn frags
SB-7	9/15/2005	1	BDL	BDL	BDL	dk brn silty sand, med sort, vry fine, qtz, orgs, ang-sub ang
		2	BDL	BDL	BDL	md brn med sort, ang-sub ang very fine grain, silty sand
		3	BDL	BDL	BDL	lter brn med sort ang-sub ang silty sand, smll frags, orgs,qtz
		4	BDL	BDL	BDL	lt orang brn ang-sub angmed sort, qtz few org,
		6	BDL	BDL	BDL	md dk orang brn, iron staining, clayey sand
		8	BDL	BDL	BDL	dk gry iron staind, sandy clay w/ seams of dker mostly clay
		10	BDL	BDL	BDL	vry lt colord w/ lrg iron staining, sandy clay, dkr gry streams
		12	BDL	BDL	BDL	lt gry sandy clay clayey sand, some iron staining
		14	BDL	BDL	BDL	vry lt gry sandy clay, clayey sand, few amt iron staining
		16	BDL	BDL	BDL	med brn, iron staining, silty sand, moderately sorted
		18	BDL	BDL	BDL	sandy clay, light gray, iron staining, limestone fragments
		20	BDL	BDL	BDL	silty clay, light gray, limestone frgmnts, iron staining
		22	BDL	BDL	BDL	sandy clay, lt tan gray, iron stain, limestone frgmnts
		24	BDL	BDL	BDL	silty clay,iron staining, extra limestone, greenish gray
SB-8	9/14/2005	1	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sorted qtz, orgs
		2	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sort qtz, orgs, iron modules
		3	BDL	BDL	BDL	md brnish gry silty sand ang-sub ang med sort, qtz
		4	BDL	BDL	BDL	lghter brnish gry silty sand, ang-sub ang, med sort, qtz
		6	BDL	BDL	BDL	clayey sand md brnish orang very iron stained
		8	BDL	BDL	BDL	sandy clay md brnish gry iron staining small lmstn frags
		10	BDL	BDL	BDL	sandy clay lgt gry sign iron stain
		12	BDL	BDL	BDL	lt gry sandy clay lmstn frags
		14	1	BDL	1	sandy clay orang & lt gry lots of iron stain, lmstn frags
		16	1	BDL	1	silty clay md brn gry, some iron stain lmstn frags
		18	5	BDL	5	silty clay md gry, some iron stain lmstn frags
		20	3	BDL	3	silty clay md gry, some iron stain
		22	16	BDL	16	silty clay lt tan gry, some iron stain lmstn frags
		24	80	BDL	80	org grnish silty clay signif iron stain

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

BORING NO.	SAMPLE DATE COLLECTED	SAMPLE INTERVAL	TOTAL READING	CARBON FILTERED	NET READING	SOIL BORING DESCRIPTION
				OVA SCREENING RESULTS		
SB-9	9/14/2005	1	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sorted qtz, orgs
		2	BDL	BDL	BDL	dk brn silty sand, sub ang med sort qtz, orgs, iron stain
		3	BDL	BDL	BDL	md brnish gry silty sand ang-sub ang med sort, qtz
		4	BDL	BDL	BDL	lghter brnish gry silty sand, ang-sub ang, med sort, qtz
		6	BDL	BDL	BDL	clayey sand md brnish orang very iron stained
		8	BDL	BDL	BDL	sandy clay md brnish gry iron staining small lmstn frags
		10	BDL	BDL	BDL	sandy clay lgt gry sign iron stain
		12	BDL	BDL	BDL	lt gry sandy clay lmstn frags
		14	BDL	BDL	BDL	sandy clay orang & lt gry lots of iron stain, lmstn frags
		16	BDL	BDL	BDL	silty clay md brn gry, some iron stain lmstn frags
		18	BDL	BDL	BDL	silty clay md gry, some iron stain lmstn frags
		20	BDL	BDL	BDL	silty clay md gry, some iron stain
		22	BDL	BDL	BDL	silty clay lt tan gry, some iron stain lmstn frags
		24	BDL	BDL	BDL	org grnish silty clay signif iron stain
		26	BDL	BDL	BDL	
		28	BDL	BDL	BDL	
		30	BDL	BDL	BDL	
SB-10	9/14/2005	1	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sorted qtz, orgs
		2	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sort qtz, orgs, iron modules
		3	BDL	BDL	BDL	md brnish gry silty sand ang-sub ang med sort, qtz
		4	BDL	BDL	BDL	lghter brnish gry silty sand, ang-sub ang, med sort, qtz
		6	BDL	BDL	BDL	clayey sand md brnish orang med iron staining
		8	BDL	BDL	BDL	sandy clay md brnish gry iron staining small lmstn frags
		10	BDL	BDL	BDL	sandy clay lgt gry sign iron stain
		12	BDL	BDL	BDL	lt gry sandy clay lmstn frags
		14	BDL	BDL	BDL	sandy clay orang & lt gry lots of iron stain, lmstn frags
		16	1	BDL	1	silty clay md brn gry, few iron stain lmstn frags
		18	BDL	BDL	BDL	silty clay md gry, some iron stain lmstn frags
		20	1	BDL	1	silty clay md gry, some iron stain
		22	2	BDL	2	silty clay lt tan gry, some iron stain lmstn frags
		24	BDL	BDL	BDL	org grnish silty clay signif iron stain
		26	BDL	BDL	BDL	
		28	BDL	BDL	BDL	
		30	BDL	BDL	BDL	
SB-11	9/16/2005	1	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sort, orgs, qtz
		2	BDL	BDL	BDL	dk brn silty sand, ang-sub ang med sort, orgs, qtz
		3	BDL	BDL	BDL	ight brnish gry silty sand, ang-sub ang med sort, qtz
		4	BDL	BDL	BDL	lght brnish gry silt sand ang-sub ang med sort, qtz
		6	BDL	BDL	BDL	md orang brown clayey sand, signif iron stain
		8	BDL	BDL	BDL	md orang brown clayey sand, signif iron stain
		10	BDL	BDL	BDL	md brn gry sand clay some iron stain
		12	BDL	BDL	BDL	vry lgt sandy clay, some iron stain
		14	BDL	BDL	BDL	lght gry orange sand clay signif iron stain
		16	BDL	BDL	BDL	lght gry silty clay some iron stain
		18	BDL	BDL	BDL	vry lght gry silty sandy clay
		20	1	BDL	1	lime grn orange silty clay signif iron stain
		22	2	BDL	2	md orang brown silty clay, signif iron stain
		24	8	BDL	8	md grysilty sandy clay, signif iron stain

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

	SAMPLE			OVA SCREENING RESULTS		
BORING	DATE	SAMPLE	TOTAL	CARBON	NET	
NO.	COLLECTED	INTERVAL	READING	FILTERED	READING	SOIL BORING DESCRIPTION
SB-12	9/17/2005	1	BDL	BDL	BDL	dk brn, silty sand, very fine, med sort, ang-sub ang, qtz,orgs
		2	BDL	BDL	BDL	med brn, silt sand, very fine, med sort, ang-subang, qtz, orgs
		3	BDL	BDL	BDL	gry brn, silt sand, fine, med sort, ang-subang, qtz,orgs
		4	BDL	BDL	BDL	lgt brn, silt sand, very fine, some orgs, qtz
		6	BDL	BDL	BDL	med org gry clayey sand, signif iron stain
		8	BDL	BDL	BDL	med org grey clayey sand signif iron stain
		10	BDL	BDL	BDL	med orange brown sandy clay signif iron stain
		12	BDL	BDL	BDL	lgt gry sandy clay some iron stain
		14	BDL	BDL	BDL	lgt gry sandy clay
		16	BDL	BDL	BDL	gry brn, silty sand, fine grained, clay stringers
		18	BDL	BDL	BDL	lgt green gray sandy clay, signif iron stain, lmstn frags
		20	BDL	BDL	BDL	green orng silty caly signif iron stain
		22	BDL	BDL	BDL	grnish gryish org silty clay signif iron stain
		24	BDL	BDL	BDL	grnish org silty clay signif iron stain
		26	BDL	BDL	BDL	
		28	BDL	BDL	BDL	
		30	BDL	BDL	BDL	
SB-13	9/16/2005	1	BDL	BDL	BDL	silty sand, fine to very fine grain, qtz, organics,drk brn
		2	BDL	BDL	BDL	dark brown, silty sand, qtz, organics
		3	BDL	BDL	BDL	light brown, silty sand, qtz,augular to sub augular
		4	BDL	BDL	BDL	light color silty sand, very augular to augular
		6	BDL	BDL	BDL	clayey sand, rust staining, dark orange brown
		8	BDL	BDL	BDL	sandy clay, browninsh gray, iron staining
		10	BDL	BDL	BDL	sandy clay, iron rust staining
		12	BDL	BDL	BDL	light gray, sandy gray
		14	BDL	BDL	BDL	very fine silty sand, clay stringers, orange rust color
		16	BDL	BDL	BDL	sandy clay, some iron staining, brownish gray
		18	BDL	BDL	BDL	sandy clay, iron staing, some limstone, light gray
		20	BDL	BDL	BDL	silty clay with limstone, light gray
		22	BDL	BDL	BDL	silty clay with limestone pebbles
		24	BDL	BDL	BDL	silty clay,iron staining, extra limestone, greenish gray
		26	BDL	BDL	BDL	
		28	BDL	BDL	BDL	
		30	BDL	BDL	BDL	
SB-14	9/16/2005	1	BDL	BDL	BDL	dk brn, silty sand, very fine, med sort, ang-sub ang, qtz,orgs
		2	BDL	BDL	BDL	med brn, silt sand, very fine, med sort, ang-subang, qtz, orgs
		3	BDL	BDL	BDL	med gry brn, silt sand, very fine, med sort, ang-subang, qtz,orgs
		4	BDL	BDL	BDL	lgt brn, silt sand, very fine, some orgs, qtz
		6	BDL	BDL	BDL	med org gry clayey sand, signif iron stain
		8	BDL	BDL	BDL	med org grey clayey sand signif iron stain
		10	BDL	BDL	BDL	med orange brown sandy clay signif iron stain
		12	BDL	BDL	BDL	lgt gry sandy clay some iron stain
		14	BDL	BDL	BDL	lgt gry sandy clay
		16	BDL	BDL	BDL	med gry brn, silty sand, fine grained, clay stringers
		18	BDL	BDL	BDL	lgt greenish gry sandy clay, signif iron stain, lmstn frags
		20	BDL	BDL	BDL	green orang silty caly signif iron stain
		22	BDL	BDL	BDL	grnish gryish org silty clay signif iron stain
		24	BDL	BDL	BDL	grnish org silty clay signif iron stain

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

BORING NO.	SAMPLE DATE COLLECTED	SAMPLE INTERVAL	OVA SCREENING RESULTS TOTAL READING	CARBON FILTERED	NET READING	SOIL BORING DESCRIPTION
SB-15	9/16/2005	1	BDL	BDL	BDL	dk brn silty sand, ang-sub ang, med sort , orgs, qtz
		2	BDL	BDL	BDL	dk brn silty sand, ang-sub ang, med sort , orgs, qtz
		3	BDL	BDL	BDL	lt brn silty sand, ang-sub ang, med sort, qtz
		4	BDL	BDL	BDL	lt brn silty sand, ang-sub ang, med sort, qtz
		6	BDL	BDL	BDL	md orang brn clayey san signif iron stain, iron module
		8	BDL	BDL	BDL	md orang brn clayey san signif iron stain,
		10	BDL	BDL	BDL	lt gry sandy clay, some iron stain, smll imstn frags
		12	BDL	BDL	BDL	lt gry sandy clay, vry little iron staining
		14	BDL	BDL	BDL	lt gray, clayey sand, some iron staining
		16	1	BDL	1	lt gry w/ dkr gry silty sandy, some iron stain
		18	BDL	BDL	BDL	lt gry silty clay, some iron stain, lmstn frags
		20	BDL	BDL	BDL	lime grn & orang silty clay signif iron stain
		22	BDL	BDL	BDL	lt orang brn silty sand signif iron stain
		24	1	BDL	1	lt brnish gry sandy clay lrg lmstn frags
A1	3/12/08	2	0	0	0	
		4	0	0	0	
		6	0	0	0	
		8	0	0	0	
		10	2500	0	2500	
A2	3/12/08	2	0	0	0	
		4	0	0	0	
		6	5	0	5	
		8	0	0	0	
		10	5	0	5	
A3	3/12/08	2	0	0	0	
		4	0	0	0	
		6	0	0	0	
		8	0	0	0	
		10	0	0	0	
B1	3/12/08	2	0	0	0	
		4	20	0	20	
		6	32	0	32	
		8	2	0	2	
		10	0	0	0	
B2	3/12/08	2	0	0	0	
		4	20	0	20	
		6	28	0	28	
		8	0	0	0	
		10	1500	0	1500	
B3	3/12/08	2	2	0	0	
		4	6	0	20	
		6	20	0	28	
		8	0	0	0	
		10	0	0	0	
B4	3/12/08	2	2	0	0	

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

BORING NO.	SAMPLE DATE COLLECTED	SAMPLE INTERVAL	TOTAL READING	OVA SCREENING RESULTS CARBON FILTERED	NET READING	SOIL BORING DESCRIPTION
B5	3/12/08	2	2	0	0	
B6	3/12/08	2	2	0	0	
C1	3/12/03	2	0	0	0	
		4	4	0	4	
		6	30	0	30	
		8	0	0	0	
		10	NR	0	NR	
C2	3/12/08	2	0	0	0	
		4	25	0	25	
		6	20	0	20	
		8	1	0	1	
		10	0	0	0	
C3	3/12/08	2	0	0	0	
		4	2	0	2	
		6	35	0	35	
		8	0	0	0	
		10	850	0	850	
C4	3/12/08	2	0	0	0	
		8	0	0	0	
C5	3/12/08	2	2	0	0	
		8	0	0	0	
C6	3/12/08	2	0	0	0	
		8	0	0	0	
D1	3/14/08	2	0	0	0	
		4	0	0	0	
		6	15	0	15	
		8	1	0	1	
		10	1	0	1	
D2	3/14/08	2	0	0	0	
		4	2	0	2	
		6	4	0	4	
		8	3	0	3	
		10	0	0	0	
D3	3/14/08	2	0	0	0	
		4	0	0	0	
		6	0	0	0	
		8	0	0	0	
		10	0	0	0	
D4	3/14/08	2	0	0	0	
		4	0	0	0	
		6	0	0	0	
		8	0	0	0	
		10	0	0	0	
D5	3/14/08	2	0	0	0	
		4	0	0	0	
		6	0	0	0	
		8	0	0	0	
D6	3/14/08	2	0	0	0	
		4	0	0	0	
		6	0	0	0	
		8	0	0	0	

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: AA Discount
FDEP FAC#: 60/8516863

	SAMPLE			OVA SCREENING RESULTS		
BORING	DATE	SAMPLE	TOTAL	CARBON	NET	
NO.	COLLECTED	INTERVAL	READING	FILTERED	READING	SOIL BORING DESCRIPTION
OB-1	2/8/2018	1	< 1		< 1	
		2	< 1		< 1	
		3	< 1		< 1	
		4	< 1		< 1	
		5	< 1		< 1	
		7	9		9	
		9	10		10	
		11	9		9	
		13	11		11	
		15	4		4	
		17	<1		<1	
		19	1		1	
		21	2		2	
		23	2		2	
		25	2		2	
		27	3		3	
		29	8		8	
		31	62		62	
		33	73		73	
		35	60		60	
OB-2	2/8/2018	1	< 1		< 1	
		2	< 1		< 1	
		3	< 1		< 1	
		4	< 1		< 1	
		5	< 1		< 1	
		7	3		3	
		9	4		4	
		11	3		3	
		13	2		2	
		15	2		2	
		17	2		2	
		19	2		2	
		21	< 1		< 1	
		23	< 1		< 1	
		25	1		1	
		27	1		1	
		29	< 1		< 1	
		31	< 1		< 1	
		33	< 1		< 1	
		35	< 1		< 1	
SVE-1	2/8/2018	1	< 1		< 1	
		2	< 1		< 1	
		3	< 1		< 1	
		4	< 1		< 1	
		5	< 1		< 1	
		7	2		2	
		9	13		13	
		11	5		5	
		13	2		2	
		15	2		2	
		17	2		2	
		19	3		3	
		21	2		2	
		23	2		2	
		25	6		6	

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: **AA Discount**
FDEP FAC#: **60/8516863**

BORING NO.	SAMPLE DATE COLLECTED	SAMPLE INTERVAL	OVA SCREENING RESULTS TOTAL READING	CARBON FILTERED	NET READING	SOIL BORING DESCRIPTION
AS-1	2/8/2018	1	< 1		< 1	
		2	< 1		< 1	
		3	< 1		< 1	
		4	< 1		< 1	
		5	< 1		< 1	
		7	< 1		< 1	
		9	< 1		< 1	
		11	< 1		< 1	
		13	< 1		< 1	
		15	< 1		< 1	
		17	< 1		< 1	
		19	< 1		< 1	
		21	12		12	
		23	68		68	
		25	1711		1711	
		27	277		277	
		29	46		46	
		31	23		23	
		33	10		10	
		35	16		16	
		37	12		12	
		39	11		11	
		41	16		16	
		43	4		4	
		45	4		4	

NOTES:

2) FT BLS = Feet Below Land Surface
3) ppm = Part Per Million
4) NS = No Sample
5) NR = No Response

TABLE 2A: SOIL ANALYTICAL SUMMARY - VOA, TRPH, Metals

Facility Name: AA Discount
FDEP Facility ID: 60/8516863

Sample				OVA	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	TRPHs	Barium	Selenium	Silver	Mercury	Arsenic	Cadmium	Chromium	Lead
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SCTL for Leachability Based on Groundwater Criteria					0.007	0.5	0.6	0.2	0.09	340	120**	5.2	17	3	*	7.5	38	*
SCTL for Direct Exposure Residential					1.2	7,500	1,500	130	4,400	460	1600	440	410	2.1	2.1	82	210	400
(mg/kg)					1.7	60,000	9200	700	24,000	2700					12	1700	470	1400
Boring No. / Well ID No.	Date Collected	Land/ Mobile Lab	Sample Interval (ft bls)	Net OVA Reading (ppm)														
EB	4/29/1994	N/A	13 - 15		0.8	2.4	0.20	1.10	0.80	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/29/1994	N/A	18		0.2	0.8	0.10	0.70	0.70	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-A			4		0.00060 U	0.0037	0.0012		0.0014	5 U								
SB-B	7/21/1999		16		0.04	0.67	0.22	NS	0.07	5 U	NS	NS	NS	NS	NS	NS	NS	NS
	7/21/1999		18		0.089	0.63	0.06	NS	0.23	5 U	NS	NS	NS	NS	NS	NS	NS	NS
	7/21/1999		20		0.003	0.02	0.04	NS	0.32	5 U	NS	NS	NS	NS	NS	NS	NS	NS
SB-1	9/15/2005	Land	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	9		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2008	Land	10								180	2.6	0.75 U	0.024	3.1	0.12 U	51	5.7
	9/15/2005	Land	30		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-2	9/14/2005	Land	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	9		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2008	Land	10		NS	NS	NS	NS	NS	NS	160	2.4	0.71 U	0.019	3.1	0.11 U	53	8.0
	9/14/2005	Mobile	18		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	24		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-3	9/14/2005	Land	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	2		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	9		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2008	Land	10		NS	NS	NS	NS	NS	NS	170	2.3	0.74 U	0.019	1.7	0.12 U	38	3.3
	9/14/2005	Mobile	25		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-4	9/14/2005	Land	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	9		BDL	BDL	BDL	BDL	BDL									
SB-6	9/15/2005	Land	4		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	4		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	9		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	25		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	25		0.0329	0.0385	0.163	0.838	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	30		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	30		0.130	0.722	0.204	0.899	0.0254	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-7	9/15/2005	Land	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	5		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	9		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	25		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-8	9/15/2005	Land	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	5		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	9		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	25		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	25		0.131	BDL	0.0865	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE 2A: SOIL ANALYTICAL SUMMARY - VOA, TRPH, Metals

Facility Name: **AA Discount**
FDEP Facility ID: **60/8516863**

Sample				OVA	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	TRPHs	Barium	Selenium	Silver	Mercury	Arsenic	Cadmium	Chromium	Lead
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SCTL for Leachability Based on Groundwater Criteria					**0.007**	**0.5**	**0.6**	**0.2**	**0.09**	**340**	**120****	**5.2**	**17**	**3**	*****	**7.5**	**38**	*****
SCTL for Direct Exposure Residential					**1.2**	**7,500**	**1,500**	**130**	**4,400**	**460**	**1600**	**440**	**410**	**2.1**	**2.1**	**82**	**210**	**400**
(mg/kg)					**1.7**	**60,000**	**9200**	**700**	**24,000**	**2700**					**12**	**1700**	**470**	**1400**
Boring No. / Well ID No.	**Date Collected**	**Land/ Mobile Lab**	**Sample Interval (ft bls)**	**Net OVA Reading (ppm)**														
SB-9	**9/14/2005**	**Land**	**9**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	**Mobile**	**9**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	**Mobile**	**25**		**0.0483**	BDL	0.0893	**0.154**	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-10	**9/14/2005**	**Land**	**5**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	**Mobile**	**5**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	**Land**	**9**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	**Mobile**	**9**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	**Mobile**	**25**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-11	**9/16/2005**	**Mobile**	**5**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Land**	**9**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**9**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Land**	**25**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**25**		**0.0591**	BDL	0.106	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Land**	**30**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**30**		**0.0851**	0.0694	0.122	**0.2384**	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**32.5**		0.00254	BDL	0.0141	0.0488	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-12	**9/16/2005**	**Mobile**	**9**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**25**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**30**		0.00148	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-13	**9/16/2005**	**Mobile**	**8**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**30**		0.00428	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-14	**9/16/2005**	**Mobile**	**5**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**8**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Land**	**30**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**30**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-15	**9/16/2005**	**Land**	**8**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**8**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**25**		BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS	NS	NS
SS-North Wall	**3/14/2008**		**6**		0.00088 U	0.00062 U	0.00047 U	0.0011 I	0.00047 U	1100 U	NS	NS	NS	NS	NS	NS	NS	NS
SS-South Wall	**3/14/2008**		**6**		0.052 U	0.086 U	0.045 U	0.190 U	0.028 U	1000 U	NS	NS	NS	NS	NS	NS	NS	NS
SS-East Wall	**3/14/2008**		**6**		0.0011 U	0.0008 U	0.00061 U	0.0011 U	0.00061 U	1200 U	NS	NS	NS	NS	NS	NS	NS	NS
SS-West Wall	**3/14/2008**		**6**		0.0011 U	0.00331 I	0.0025 I	0.019	0.0006 U	1200 U	NS	NS	NS	NS	NS	NS	NS	NS
SS-Bottom	**3/14/2008**		**12**		0.0015 U	0.015	0.0093	0.110	0.00078 U	26 I	NS	NS	NS	NS	NS	NS	NS	NS

NOTES: NA = Not Available
NS = Not Sampled
* = Leachability value may be determined using TCLP.

Bold indicates analyte is detected above the SCTL.

TABLE 2B: SOIL ANALYTICAL SUMMARY - Non-Carcinogenic PAHs

Facility Name: AA Discount

FDEP Facility ID: 60/8516863

Sample				OVA	Naph-thalene	1-Methyl-naph-thalene	2-Methyl-naph-thalene	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (g,h,i) perylene	Fluoran-thene	Fluorene	Phenan-threne	Pyrene
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SCTL for Leachability Based on Groundwater Criteria					1.2	3.1	8.5	2.1	27	2,500	32,000	1,200	160	250	880
SCTL for Direct Exposure Residential					55	200	210	2,400	1,800	21,000	2,500	3,200	2,600	2,200	2,400
Soil Cleanup Target Level for Direct Exposure Commercial (mg/kg)					300	1800	2100	20,000	20,000	300,000	52,000	59,000	33,000	36,000	45,000
Boring No. / Well ID No.	Date Collected	Land/ Mobile Lab	Sample Interval (ft bls)	Net OVA Reading (ppm)											
SB-A	7/21/1999		4		0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
SB-B	7/21/1999		16		0.400 U	0.400 U	0.0400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
	7/21/1999		18		0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U
	7/21/1999		20		0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U
SB-1	9/15/2005	Land	9		0.019 U	0.020 U	0.035 U	0.031 U	0.027 U	0.037 U	0.032 U	0.034 I	0.029 U	0.09 I	0.031 I
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	30		0.020 U	0.021 U	0.038 U	NS	NS	NS	NS	NS	NS	NS	NS
SB-2	9/14/2005	Land	9		0.018 U	0.020 U	0.034 U	0.031 U	0.026 U	0.037 U	0.032 U	0.023 U	0.023 U	0.026 U	0.020 U
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	18		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	24		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-3	9/14/2005	Land	9		0.020 U	0.021 U	0.037 U	0.033 U	0.028 U	0.039 U	0.034 U	0.024 U	0.030 U	0.028 U	0.021 U
	9/14/2005	Mobile	2		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-4	9/14/2005	Land	9		0.019 U	0.020 U	0.035 U	0.031 U	0.027 U	0.037 U	0.032 U	0.026 I	0.039 U	0.027 U	0.022 I
	9/14/2005	Mobile	9												
SB-6	9/15/2005	Land	4		0.016 U	0.017 U	0.030 U	0.027 U	0.023 U	0.032 U	0.028 U	0.020 U	0.025 U	0.023 U	0.017 U
	9/15/2005	Mobile	4		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	9		0.016 U	0.017 U	0.030 U	0.027 U	0.016 U	0.032 U	0.028 U	0.020 U	0.025 U	0.023 U	0.017 U
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	25		0.24	0.19	0.43	0.028 U	0.023 U	0.033 U	0.029 U	0.020 U	0.026 U	0.023 U	0.017 U
	9/15/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	30		0.020 U	0.021 U	0.038 U	0.034 U	0.029 U	0.040 U	0.035 U	0.025 U	0.031 U	0.029 U	0.021 U
	9/15/2005	Mobile	30												
SB-7	9/15/2005	Land	5		0.020 U	0.021 U	0.037 U	0.033 U	0.028 U	0.039 U	0.034 U	0.025 U	0.031 U	0.028 U	0.021 U
	9/15/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	9		0.018 U	0.019 U	0.034 U	0.030 U	0.026 U	0.036 U	0.031 U	0.022 U	0.028 U	0.026 U	0.019 U
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Mobile	25												

TABLE 2B: SOIL ANALYTICAL SUMMARY - Non-Carcinogenic PAHs

Facility Name: **AA Discount**
FDEP Facility ID: **60/8516863**

Sample				OVA	Naph-thalene	1-Methyl-naph-thalene	2-Methyl-naph-thalene	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (g,h,i) perylene	Fluoran-thene	Fluorene	Phenan-threne	Pyrene
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SCTL for Leachability Based on Groundwater Criteria					1.2	3.1	8.5	2.1	27	2,500	32,000	1,200	160	250	880
SCTL for Direct Exposure Residential					55	200	210	2,400	1,800	21,000	2,500	3,200	2,600	2,200	2,400
Soil Cleanup Target Level for Direct Exposure Commercial (mg/kg)					300	1800	2100	20,000	20,000	300,000	52,000	59,000	33,000	36,000	45,000
SB-8	9/15/2005	Land	5		0.019 U	0.020 U	0.036 U	0.032 U	0.027 U	0.038 U	0.033 U	0.024 U	0.030 U	0.027 U	0.020 U
	9/15/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	9		0.017 U	0.019 U	0.033 U	0.029 U	0.025 U	0.035 U	0.031 U	0.022 U	0.027 U	0.025 U	0.019 U
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/15/2005	Land	25		0.021 U	0.022 U	0.040 U	0.036 U	0.030 U	0.042 U	0.037 U	0.028 U	0.033 U	0.030 U	0.022 U
	9/15/2005	Mobile	25												
SB-9	9/14/2005	Land	9		0.016 U	0.018 U	0.031 U	0.028 U	0.024 U	0.033 U	0.029 U	0.021 U	0.028 U	0.024 U	0.018 U
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	25												
SB-10	9/14/2005	Land	5		0.019 U	0.020 U	0.036 U	0.032 U	0.026 U	0.038 U	0.034 U	0.024 U	0.030 U	0.028 U	0.020 U
	9/14/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Land	9		0.018 U	0.019 U	0.034 U	0.030 U	0.026 U	0.036 U	0.031 U	0.022 U	0.026 U	0.026 U	0.019 U
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/14/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-11	9/16/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Land	9		0.018 U	0.019 U	0.034 U	0.030 U	0.026 U	0.036 U	0.031 U	0.022 U	0.028 U	0.025 U	0.19 U
	9/16/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Land	25		0.017 U	0.018 U	0.032 U	0.028 U	0.024 U	0.034 U	0.029 U	0.021 U	0.026 U	0.024 U	0.018 U
	9/16/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Land	30		0.023 U	0.025 U	0.044 U	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Mobile	30		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Mobile	32.5		0.023 U	0.025 U	0.044 U	0.039 U	0.033 U	0.046 U	0.041 U	0.029 U	0.036 U	0.033 U	0.025 U
SB-14	9/16/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Mobile	8		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	Land	30		0.023 U	0.025 U	0.044 U	0.039 U	0.033 U	0.046 U	0.041 U	0.029 U	0.036 U	0.033 U	0.025 U
	9/16/2005	Mobile	30		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE 2B: SOIL ANALYTICAL SUMMARY - Non-Carcinogenic PAHs

Facility Name: **AA Discount**
FDEP Facility ID: **60/8516863**

Sample				OVA	Naph-thalene (mg/kg)	1-Methyl-naph-thalene (mg/kg)	2-Methyl-naph-thalene (mg/kg)	Acenaph-thene (mg/kg)	Acenaph-thylene (mg/kg)	Anthra-cene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)	Fluoran-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Pyrene (mg/kg)
SCTL for Leachability Based on Groundwater Criteria					**1.2**	**3.1**	**8.5**	**2.1**	**27**	**2,500**	**32,000**	**1,200**	**160**	**250**	**880**
SCTL for Direct Exposure Residential					**55**	**200**	**210**	**2,400**	**1,800**	**21,000**	**2,500**	**3,200**	**2,600**	**2,200**	**2,400**
Soil Cleanup Target Level for Direct Exposure Commercial (mg/kg)					**300**	**1800**	**2100**	**20,000**	**20,000**	**300,000**	**52,000**	**59,000**	**33,000**	**36,000**	**45,000**
SB-15	**9/16/2005**	**Land**	**8**		0.022 U	0.023 U	0.041 U	0.037 U	0.032 U	0.044 U	0.038 U	0.027 U	0.034 U	0.032 U	0.023 U
	9/16/2005	**Mobile**	**8**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	**Mobile**	**25**		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SS-North Wall	**3/14/2008**		**6**		0.0095 U	0.016 U	0.0095 U	0.0095 U	0.014 U	0.014 U	0.013 U	0.012 U	0.013 U	0.012 U	0.014 U
SS-South Wall	**3/14/2008**		**6**		0.0093 U	0.015 U	0.0093 U	0.0093 U	0.013 U	0.013 U	0.012 U	0.011 U	0.12 U	0.011 U	0.013 U
SS-East Wall	**3/14/2008**		**6**		0.011 U	0.018 U	0.011 U	0.011 U	0.015 U	0.015 U	0.014 U	0.013 U	0.014 U	0.013 U	0.015 U
SS-West Wall	**3/14/2008**		**6**		0.011 U	0.018 U	0.011 U	0.011 U	0.015 U	0.015 U	0.014 U	0.013 U	0.014 U	0.013 U	0.015 U
SS-Bottom	**3/14/2008**		**12**		0.027 U	0.020 U	0.018 U	0.012 U	0.018 U	0.018 U	0.016 U	0.015 U	0.016 U	0.015 U	0.018 U

NOTES: NA = Not Available
NS = Not Sampled
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Bold indicates analyte is detected above the SCTL.

TABLE 2C: SOIL ANALYTICAL SUMMARY - Carcinogenic PAHs

Facility Name: AA Discount
FDEP Facility ID: 60/8516863

Sample				OVA	Benzo (a) pyrene	Benzo (a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno (1,2,3-cd) pyrene	Benzo (a) pyrene equivalent
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SCTL for Leachability Based on Groundwater Criteria					8	0.8	2.4	24	77	0.7	6.6	8
SCTL for Direct Exposure Residential					0.1	1.3	1.3	13	130	0.1	1.3	0.1
SCTL for Direct Exposure Commercia					0.7	6.6	6.5	66	640	0.7	6.6	0.7
Boring No. / Well ID No.	Date Collected	Land/ Mobile Lab	Sample Interval (ft bls)	Net OVA Reading (ppm)								
SB-A	7/21/1999		4		0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	
SB-B	7/21/1999		16		0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	
	7/21/1999		18		0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	0.420 U	
	7/21/1999		20		0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	
SB-1	9/15/2005	Land	9		0.027 U	0.045 U	0.041 U	0.037 U	0.029 U	0.035 U	0.034 U	
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	30		NS	NS	NS	NS	NS	NS	NS	
SB-2	9/14/2005	Land	9		0.026 U	0.045 U	0.040 U	0.037 U	0.029 U	0.034 U	0.033 U	
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Mobile	18		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Mobile	24		NS	NS	NS	NS	NS	NS	NS	
SB-3	9/14/2005	Land	9		0.028 U	0.048 U	0.043 U	0.039 U	0.030 U	0.037 U	0.035 U	
	9/14/2005	Mobile	2		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
SB-4	9/14/2005	Land	9		0.027 U	0.045 U	0.041 U	0.037 U	0.029 U	0.035 U	0.034 U	
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
SB-6	9/15/2005	Land	4		0.023 U	0.039 U	0.035 U	0.032 U	0.025 U	0.030 U	0.029 U	
	9/15/2005	Mobile	4		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	9		0.023 U	0.039 U	0.035 U	0.032 U	0.025 U	0.030 U	0.029 U	
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	25		0.023 U	0.040 U	0.036 U	0.033 U	0.026 U	0.031 U	0.030 U	
	9/15/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	30		0.029 U	0.049 U	0.044 U	0.040 U	0.031 U	0.038 U	0.036 U	
	9/15/2005	Mobile	30		NS	NS	NS	NS	NS	NS	NS	
SB-7	9/15/2005	Land	5		0.028 U	0.048 U	0.043 U	0.039 U	0.031 U	0.037 U	0.036 U	
	9/15/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	9		0.026 U	0.044 U	0.039 U	0.036 U	0.028 U	0.034 U	0.032 U	
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
SB-8	9/15/2005	Land	5		0.027 U	0.046 U	0.042 U	0.038 U	0.030 U	0.036 U	0.035 U	
	9/15/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	9		0.025 U	0.043 U	0.038 U	0.035 U	0.027 U	0.033 U	0.032 U	
	9/15/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/15/2005	Land	25		0.030 U	0.051 U	0.046 U	0.042 U	0.033 U	0.040 U	0.038 U	
	9/15/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	

TABLE 2C: SOIL ANALYTICAL SUMMARY - Carcinogenic PAHs

Facility Name: AA Discount
FDEP Facility ID: 60/8516863

Sample				OVA	Benzo (a) pyrene (mg/kg)	Benzo (a) anthracene (mg/kg)	Benzo(b) fluoranthene (mg/kg)	Benzo(k) fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenz(a,h) anthracene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Benzo (a) pyrene equivalent (mg/kg)
SCTL for Leachability Based on Groundwater Criteria					8	0.8	2.4	24	77	0.7	6.6	8
SCTL for Direct Exposure Residential					0.1	1.3	1.3	13	130	0.1	1.3	0.1
SCTL for Direct Exposure Commercia					0.7	6.6	6.5	66	640	0.7	6.6	0.7
SB-9	9/14/2005	Land	9		0.024 U	0.040 U	0.036 U	0.033 U	0.026 U	0.031 U	0.030 U	
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
SB-10	9/14/2005	Land	5		0.028 U	0.047 U	0.042 U	0.038 U	0.030 U	0.036 U	0.035 U	
	9/14/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Land	9		0.026 U	0.044 U	0.039 U	0.036 U	0.028 U	0.034 U	0.032 U	
	9/14/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/14/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
SB-11	9/16/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Land	9		0.026 U	0.044 U	0.039 U	0.036 U	0.028 U	0.034 U	0.032 U	
	9/16/2005	Mobile	9		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Land	25		0.024 U	0.041 U	0.037 U	0.034 U	0.026 U	0.032 U	0.030 U	
	9/16/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Land	30		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Mobile	30		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Mobile	32.5		0.033 U	0.057 U	0.051 U	0.046 U	0.036 U	0.044 U	0.042 U	
SB-14	9/16/2005	Mobile	5		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Mobile	8		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Land	30		0.033 U	0.057 U	0.051 U	0.046 U	0.036 U	0.044 U	0.042 U	
	9/16/2005	Mobile	30		NS	NS	NS	NS	NS	NS	NS	
SB-15	9/16/2005	Land	8		0.032 U	0.053 U	0.048 U	0.044 U	0.034 U	0.041 U	0.040 U	
	9/16/2005	Mobile	8		NS	NS	NS	NS	NS	NS	NS	
	9/16/2005	Mobile	25		NS	NS	NS	NS	NS	NS	NS	
SS-North Wall	3/14/2008		6		0.0084 U	0.013 U	0.012 U	0.0095 U	0.020 U	0.015 U	0.019 U	
SS-South Wall	3/14/2008		6		0.0082 U	0.012 U	0.011 U	0.0093 U	0.020 U	0.014 U	0.019 U	
SS-East Wall	3/14/2008		6		0.0095 U	0.014 U	0.013 U	0.011 U	0.023 U	0.017 U	0.021 U	
SS-West Wall	3/14/2008		6		0.0095 U	0.015 U	0.013 U	0.011 U	0.023 U	0.017 U	0.021 U	
SS-Bottom	3/14/2008		12		0.018 U	0.016 U	0.015 U	0.012 U	0.026 U	0.019 U	0.024 U	

NOTES: NA = Not Available
NS = Not Sampled
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
Bold indicates analyte is detected above the SCTL.

TABLE 3: GROUNDWATER ELEVATION SUMMARY

Facility Name: AA Discount
Address: 181 W Kings Highway **FDEP Facility ID #:** 60/8516863
City, State: Center Hill, Florida

WELL NO.	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
DIAMETER (in)	2	2	2	2	2	2
WELL DEPTH (ft)	24	24	24	24	24	25
SCREEN INTERVAL (	14-24	14-24	14-24	14-24	14-24	10-25
TOC ELEVATION (ft)	94.93	95.86	95.55	94.16	93.99	93.7

DATE	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF
5/31/1994	76.51	18.42		76.44	19.42		76.51	19.04		76.52	17.64		76.61	17.38			NS	
8/5/1994	79.03	15.90	2.52	78.96	16.90	2.52	78.85	16.70	2.34	79.52	14.64	3.00	80.29	13.7	3.68	79.46	14.24	
9/14/1994	80.99	13.94	1.96	81.26	14.60	2.30	80.92	14.63	2.07	81.46	12.70	1.94	81.61	12.38	1.32	81.52	12.18	2.06
7/28/1999	76.78	18.15	-4.21	76.83	19.03	-4.43	76.74	18.81	-4.18	76.91	17.25	-4.55	76.89	17.1	-4.72	75.92	17.78	-5.60
1/19/2000	77.17	17.76	0.39	77.23	18.63	0.40	77.17	18.38	0.43	77.26	16.90	0.35	77.15	16.84	0.26	77.3	16.4	1.38
7/14/2000	72.86	22.07	-4.31	72.81	23.05	-4.42	72.79	22.76	-4.38	73.16	21.00	-4.10	73.37	20.62	-3.78	73.1	20.6	-4.20
10/11/2001	81.99	12.94	9.13	82.52	13.34	9.71	81.67	13.88	8.88	82.27	11.89	9.11	81.98	12.01	8.61	82.58	11.12	9.48
11/27/2001	79.63	15.30	-2.36		NS			NS		79.66	14.50	-2.61	79.59	14.4	-2.39		NS	
2/13/2003	82.01	12.92	2.38	81.96	13.90		81.84	13.71		82.20	11.96	2.54	82.2	11.79	2.61	82.26	11.44	
8/25/2003	86.21	8.72	4.20	87.09	8.77	5.13	86.33	9.22	4.49	86.09	8.07	3.89	85.87	8.12	3.67	86.04	7.66	3.78
2/20/2004	81.25	13.68	-4.96	81.36	14.50	-5.73	81.24	14.31	-5.09	81.29	12.87	-4.80	81.27	12.72	-4.60	81.34	12.36	-4.70
12/22/2004	81.94	12.99	0.69	82.17	13.69	0.81	81.38	14.17	0.14	81.89	12.27	0.60	81.84	12.15	0.57	81.97	11.73	0.63
9/16/2005	85.53	9.40	3.59		NS		85.55	10.00	4.17	85.61	8.55	3.72	85.29	8.70	3.45	85.95	7.75	3.98
3/6/2006	83.13	11.80	-2.40	84.41	11.45		83.06	12.49	-2.49	83.05	11.11	-2.56	82.94	11.05	-2.35	83.10	10.60	-2.85
2/7/2007	76.42	18.51	-6.71	76.44	19.42	-7.97	76.38	19.17	-6.68	77.49	16.67	-5.56	76.57	17.42	-6.37	76.52	17.18	-6.58
6/9/2010		NS			NS			NS			NS			NS			NS	
10/11/2010		NS			NS			NS			NS			NS			NS	
12/13/2010		NS			NS			NS			NS			NS			NS	
5/11/2011		NS			NS			NS			NS		73.94	20.05			NS	
11/14/2011		NS			NS			NS			NS		72.19	21.80	-1.75		NS	
2/28/2012		NS			NS			NS			NS		70.67	23.32	-1.52		NS	
7/20/2012		NS			NS			NS			NS		73.38	20.61	2.71		NS	
10/24/2012		Abandoned			Abandoned			Abandoned			Abandoned		78.00	15.99	4.62		Abandoned	
3/14/2013													73.90	20.09	-4.10			
3/26/2013													73.60	20.39	-0.30			
7/9/2013													73.44	20.55	-0.16			
6/23/2017													70.20	23.79				

TABLE 3: GROUNDWATER ELEVATION SUMMARY

Facility Name: AA Discount
Address: 181 W Kings Highway **FDEP Facility ID #:** 60/8516863
City, State: Center Hill, Florida

WELL NO.	MW-11D	MW-12	MW-13	MW-14	MW-15	MW-16
DIAMETER (in)	2	2	2	2	2	2
WELL DEPTH (ft)	42	25	25	25	25	28
SCREEN INTERVAL (	37-42	10-25	10-25	10-25	10-25	13-28
TOC ELEVATION (ft)	94.69	93.53	95.36	96.57	95.00	98.02

DATE	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF
5/31/1994		NS			NS													
8/5/1994	78.65	16.04		79.83	13.7		78.96	16.4		79.35	17.22		79.24	15.76		79.52	18.5	
9/14/1994	80.06	14.63	1.41	81.54	11.99	1.71	80.89	14.47	1.93	81.61	14.96	2.26	81.38	13.62	2.14	81.85	16.17	2.33
7/28/1999	77.76	16.93	-2.30	76.9	16.63	-4.64	76.7	18.66	-4.19	76.92	19.65	-4.69	76.98	18.02	-4.40	76.93	21.09	-4.92
1/19/2000	77.11	17.58	-0.65	77.23	16.3	0.33	77.11	18.25	0.41	77.34	19.23	0.42	77.37	17.63	0.39	77.34	20.68	0.41
7/14/2000	74.42	20.27	-2.69	73.17	20.36	-4.06	72.73	22.63	-4.38	72.93	23.64	-4.41	73.3	21.7	-4.07	72.92	25.1	-4.42
10/11/2001	78.26	16.43	3.84	82.18	11.35	9.01	81.62	13.74	8.89	83.26	13.31	10.33	82.77	12.23	9.47	83.57	14.45	10.65
11/27/2001		NS		79.63	13.9	-2.55	79.53	15.83	-2.09				79.87	15.13	-2.90			
2/13/2003	80.29	14.4		82.21	11.32	2.58	81.86	13.5	2.33	82.35	14.22		82.25	12.75	2.38	82.5	15.52	
8/25/2003	81.74	12.95	1.45	85.96	7.57	3.75	86.25	9.11	4.39	87.62	8.95	5.27	86.33	8.67	4.08	88.07	9.95	5.57
2/20/2004	82.35	12.34	0.61	81.28	12.25	-4.68	81.18	14.18	-5.07	81.46	15.11	-6.16	81.36	13.64	-4.97	81.45	16.57	-6.62
12/22/2004	78.44	16.25		81.84	11.69	0.56	81.20	14.16	0.02	83.32	13.25	1.86	82.07	12.93	0.71	82.86	15.16	1.41
9/16/2005		NS		85.43	8.10	3.59		NS			NS		85.90	9.10	3.83		NS	
3/6/2006		NS		82.97	10.56	-2.46	83.00	12.36		83.49	13.08		83.23	11.77	-2.67	83.52	14.5	
2/7/2007	80.21	14.48		76.55	16.98	-6.42	76.34	19.02	-6.66	76.55	20.02	-6.94	76.55	18.45	-6.68			
6/9/2010		NS		77.66	15.87	1.11	77.24	18.12	0.90		NS		77.48	17.52	0.93	77.89	20.13	
10/11/2010		NS		75.27	18.26	-2.39	75.36	20	-1.88		NS		75.20	19.8	-2.28			
12/13/2010		NS		73.28	20.25	-1.99	73.30	22.06	-2.06		NS		73.80	21.2	-1.40			
5/11/2011		NS			NS			NS			NS			NS		74.28	23.74	
11/14/2011		NS			NS			NS			NS			NS		72.52	25.50	-1.76
2/28/2012		NS			NS			NS			NS			NS		69.06	28.96	-3.46
7/20/2012		NS		72.84	20.69		72.16	23.20	-1.14		NS			NS		72.87	25.15	3.81
10/24/2012		Abandoned			NS			NS			Abandoned			NS		78.13	19.89	5.26
3/14/2013				72.28	21.25	-0.56	71.91	23.45	-0.25									
3/26/2013				73.64	19.89	1.36	73.60	21.76	1.69				73.54	21.46		74.08	23.94	
7/9/2013																73.02	25.00	-1.06
1/8/2014													72.42	22.58	-1.12			
8/20/2014																		
2/14/2018				69.50	24.03													

TABLE 3: GROUNDWATER ELEVATION SUMMARY

Facility Name: AA Discount
Address: 181 W Kings Highway **FDEP Facility ID #:** 60/8516863
City, State: Center Hill, Florida

WELL NO.	MW-17	MW-18	MW-19	CW-1	CW-2	CW-3
DIAMETER (in)	2	2	2	2	2	2
WELL DEPTH (ft)	25	25	25	8.2	7.2	7.4
SCREEN INTERVAL (	10-25	10-25	10-25	1.1-8.2	1.5-7.2	1.1-7.4
TOC ELEVATION (ft)	93.93	97.03	95.62			

DATE	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF
5/31/1994											DRY			Dry			Dry	
8/5/1994	78.39	15.54		81.58	15.45						DRY			Dry			Dry	
9/14/1994	82.17	11.76	3.78	76.9	20.13	-4.68					DRY			Dry			Dry	
7/28/1999	77.59	16.34	-4.58	77.31	19.72	0.41	76.92	18.7			DRY			Dry			Dry	
1/19/2000	77.81	16.12	0.22	72.9	24.13	-4.41	77.37	18.25	0.45		Abandoned			Dry			Dry	
7/14/2000	73.87	20.06	-3.94	72.9	24.13	0.00	73.16	22.46	-4.21					Dry			Abandoned	
10/11/2001	81.62	12.31	7.75	82.98	14.05	10.08	82.86	12.76	9.70					Dry				
11/27/2001	80.18	13.75	-1.44											Dry				
2/13/2003	82.88	11.05	2.70	81.33	15.7		82.22	13.4						Dry				
8/25/2003	86.55	7.38	3.67	87.6	9.43	6.27	86.5	9.12	4.28					Dry				
2/20/2004	81.93	12.00	-4.62	81.42	15.61	-6.18	81.36	14.26	-5.14					NS				
12/22/2004	81.80	12.13	-0.13	83.34	13.69	1.92	81.79	13.83	0.43									
9/16/2005	85.83	8.10	4.03															
3/6/2006	83.63	10.3	-2.20	83.43	13.6		83.22	12.4										
6/9/2010	78.27	15.66	-5.36		NS			NS										
10/11/2010	76.04	17.89	-2.23		NS			NS										
12/13/2010	73.95	19.98	-2.09		NS			NS										
5/11/2011	74.62	19.31	0.67		NS			NS										
11/14/2011	52.83	21.1	-21.79		NS			NS										
2/28/2012	51.43	22.5	-1.40		NS			NS										
7/20/2012	73.68	20.25	22.25		NS			NS										
10/24/2012	58.19	15.74	-15.49		Abandoned			Abandoned										
3/26/2013	74.50	19.43	16.31															
7/9/2013	73.95	19.98	-0.55															
1/8/2014	NS	NS	NS															
8/20/2014	NS	NS	NS															

TABLE 3: GROUNDWATER ELEVATION SUMMARY

Facility Name: AA Discount
Address: 181 W Kings Highway **FDEP Facility ID #:** 60/8516863
City, State: Center Hill, Florida

WELL NO.	CW-4	MW-5R	MW-6R	MW-8R	MW-5I	MW-8I
DIAMETER (in)	2	2	2	2	1	2
WELL DEPTH (ft)	7.9	24	24	24	25	30
SCREEN INTERVAL (	1.2-7.9	14-24	14-24	14-24	25-40	20-30
TOC ELEVATION (ft)		95.44	96.16	94.81	95.39	94.78

	CW-4			MW-5R			MW-6R			MW-8R			MW-5I			MW-8I		
DATE	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF	ELEV	DTW	DIFF
5/31/1994		Dry																
8/5/1994		Dry																
9/14/1994		Dry																
7/28/1999		Dry																
1/19/2000		Dry																
7/14/2000		Dry																
10/11/2001		Dry																
11/27/2001		Dry		72.14	23.30	-1.88	72.26	23.90	-1.73	72.51	22.30	-1.75						
2/13/2003		Dry		72.43	23.01	0.29	72.01	24.15	-0.25	71.26	23.55	-1.25						
8/25/2003		Dry																
2/20/2004		NS																
6/9/2010				77.37	18.07		75.47	20.69		77.62	17.19							
10/11/2010				75.47	19.97	-1.90	75.57	20.59	0.10	75.60	19.21	-2.02						
12/13/2010				72.80	22.64	-2.67	73.44	22.72	-2.13	73.63	21.18	-1.97						
5/11/2011				74.02	21.42	1.22	73.99	22.17	0.55	74.26	20.55	0.63						
7/20/2012		NS		72.45	22.99	0.02		Dry		72.08	22.73	0.82	71.79	23.60		72.19	22.59	
10/24/2012				77.64	17.80	5.19	77.68	18.48		77.89	16.92	5.81	77.15	18.24	5.36	78.14	16.64	5.95
3/14/2013							72.06	24.10	-5.62									
3/26/2013				74.08	21.36		73.68	22.48	1.62	73.90	20.91		73.37	22.02		74.08	20.70	
7/9/2013				72.94	22.50	-1.14	72.81	23.35	-0.87	73.20	21.61	-0.70	72.41	22.98	-0.96	73.32	21.46	-0.76
1/8/2014				72.63	22.81	-0.31				72.81	22.00	-0.39	72.18	23.21	-0.23	72.91	21.87	-0.41
8/20/2014				74.82	20.62	2.19				75.14	19.67	2.33	74.23	21.16	2.05	75.32	19.46	2.41
12/8/2015					Dry						Dry		67.71	27.68	-6.52	69.65	25.13	-5.67
6/7/2016										70.59	24.22		67.81	27.58	0.10	69.29	25.49	-0.36
12/13/2016													67.71	27.68	-0.10	68.98	25.80	-0.31
6/23/2017					dry						dry		64.90	30.49	-2.81	66.74	28.04	-2.24
2/14/2018				71.29	24.15					70.82	23.99					69.95	24.83	3.21

TABLE 3: GROUNDWATER ELEVATION SUMMARY

Facility Name: AA Discount
Address: 181 W Kings Highway **FDEP Facility ID #:** 60/8516863
City, State: Center Hill, Florida

WELL NO.	**MW-20I**			**MW-21D**			**MW-22I**			**MW-23I**			**OB-1**			**OB 2**		
DIAMETER (in)	2			2			2			2			2			2		
WELL DEPTH (ft)	40			55			40			40			35			35		
SCREEN INTERVAL (	25 - 40			50-55			25-40			25-40			20-35			25-35		
TOC ELEVATION (ft)	94.93			95.59			96.44			94.19								
DATE	**ELEV**	**DTW**	**DIFF**	**ELEV**	**DTW**	**DIFF**	**ELEV**	**DTW**	**DIFF**	**ELEV**	**DTW**	**DIFF**	**ELEV**	**DTW**	**DIFF**	**ELEV**	**DTW**	**DIFF**
3/26/2013	73.48	21.45																
7/9/2013	72.53	22.40	-0.95	75.36	20.23		72.54	23.90		72.89	21.30							
1/8/2014				72.34	23.25	-3.02	72.30	24.14	-0.24	72.58	21.61	-0.31						
8/20/2014	74.37	20.56																
12/8/2015	67.97	26.96	-6.40	NS	NS	NS	67.98	28.46		NS	NS	NS						
6/7/2016	68.04	26.89	0.07		NS		68.03	28.41	0.05		NS							
12/13/2016	67.53	27.40	-0.51				66.63	29.81	-1.40									
6/23/2017	55.18	39.75	-12.35	65.16	30.43		65.13	31.31	-1.50	65.40	28.79							
2/14/2018														24.42			24.59	

Notes:

Measurement Units in Feet
Blank cell indicates no data found
FP indicates free product
TOC indicates Top of Casing

Elev indicates elevation
DTW indicates depth to water
NS indicates well not sampled
NA indicates FP not observed in well

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
CW-1	5/31/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	8/5/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	9/14/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	Abandoned												NA
CW-2	5/31/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	8/5/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	9/14/2003	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	Abandoned												NA
CW-3	5/31/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	8/5/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	9/14/2003	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	Abandoned												NA
CW-4	5/31/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	8/5/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	9/14/1994	DRY	DRY	DRY	DRY	DRY	NS	NS	NS	NS	NS	NS	NA
	Abandoned												NA
MW-5/5R	5/31/1994	**5900**	**20000**	**2600**	**14000**	**1600**	0.01 U	10 U	NS	NS	NS	5 U	
MW-25 *	5/31/1994	**6100**	**20000**	**2800**	**15000**	**1500**	0.01 U	10 U	NS	NS	NS	5 U	NA
	8/5/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA
	10/13/1994	**3920**	**14900**	**1750**	**9390**	**1410**	NS	NS	NS	NS	NS	NS	NA
MW-55 *	10/13/1994	**3380**	**13000**	**1450**	**7960**	**1360**	NS	NS	NS	NS	NS	NS	NA
MW-5R	7/28/1999	**2100**	**580**	**760**	**1000**	**520**	0.010 U	50 U	NS	NS	NS	140	4200
	1/19/2000	**2400**	**74**	**720**	**509**	**820**	NA	NA	NA	NA	NA	NA	NA
	1/19/2000	**2100**	38	**650**	**392**	**730**	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	**1900**	**890**	**1400**	**1870**	**580**	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	**1900**	**800**	**1300**	**1860**	**600**	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	**3200**	**7400**	**1800**	**7400**	**920**	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	**2800**	**6400**	**1600**	**7000**	**780**	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	**2200**	**4200**	**870**	**3700**	**520**	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	**956**	**164**	**164**	**2026**	**299**	NA	NA	NA	NA	NA	NA	NA
	2/20/2004	**990**	**550**	**410**	**1200**	**350**	NA	NA	NA	NA	NA	NA	NA
	12/22/2004	**750**	**140**	**300**	**900**	**160**	NA	NA	NA	NA	NA	NA	NA
	9/16/2005	**310**	27V	**44**	**280**	**60**	NA	NA	NA	NA	NA	NA	NA
	2/7/2007	**540**	**1100**	**300 V**	**1230**	**130**	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	**350**	**190**	**120**	**220**	**75**	NA	NA	NA	NA	NA	NA	NA
	10/11/2010	**340**	**170**	**180**	**210**	**70**	NA	NA	NA	NA	NA	NA	NA
	12/13/2010	**100**	1.4	**40**	4.6	**53**	NA	NA	NA	NA	NA	NA	NA
	5/14/2011	**659**	**513**	**510**	**839**	**125**	NA	NA	NA	NA	NA	NA	3300
	11/14/2011	**162**	2.3	**67.8**	6.3	**53.9**	NA	NA	NA	NA	NA	3.7 U	1600 V
	7/20/2012	**145**	3.4	**47.4**	10	**52.3**	NA	NA	NA	NA	NA	NA	NA
	10/24/2012	**59.4**	0.21 I	0.22 U	4.7	16.7	NA	NA	NA	NA	NA	NA	NA
	3/26/2013	**31.5**	0.14 I	0.22 U	0.5 U	13.2	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	**7**	0.14 U	0.22 U	0.5 U	5.8	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	**11.3**	0.14 U	0.22 U	0.5 U	6.6	NS	NS	NS	NS	NS	NS	NS
	8/20/2014	0.17 U	0.14 U	0.22 U	0.5 U	1.8	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	DRY											
	6/23/2017	DRY											

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
MW-5I	7/20/2012	**20.6**	1.7	9.7	5.8	**64.6**	NA	NA	NA	NA	NA	NA	810
	10/24/2012	**200**	8.3	**170**	**29.6**	**73.8**	NA	NA	NA	NA	NA	NA	NA
	7/9/2013	**533**	**193**	**530**	**572**	**112**	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	**146**	0.5 I	**113**	2.8	**71.9**	NS	NS	NS	NS	NS	NS	NS
	8/20/2014	**26.8**	0.65 I	9.8	0.66 I	**64**	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	**9.37**	0.400U	0.400U	0.800U	**70.6**	NS	NS	NS	NS	NS	NS	NS
	6/7/2016	0.67 I	0.45 U	0.26 U	1.3 U	**53**	NS	NS	NS	NS	NS	NS	NS
	12/13/2016	0.680 i	0.400 U	0.750 i	0.800 U	**41.1**	NS	NS	NS	NS	NS	NS	NS
	6/23/2017	0.400 U	0.400 U	0.400 U	0.800 U	**32.6**	NS	NS	NS	NS	NS	NS	NS
MW-6/6R	5/31/1994	**1.2**	BDL	BDL	BDL	BDL	0.01 U	1 U	NS	NS	NS	9	NA
	8/5/1994	**63.4**	BDL	BDL	2.9	BDL	NS	NS	NS	NS	NS	NS	NA
	10/13/1994	**98.7**	BDL	BDL	2.4	BDL	NS	NS	NS	NS	NS	NS	NA
	7/28/1999	<0.5	<0.5	<0.5	BDL	<0.5	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA
	2/7/2007	**3.9**	6.8	1.2 V	3.7	0.20 U	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NA
	10/11/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NA
	12/13/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NA
	5/11/2011	0.17 U	0.14 U	0.22 U	0.28 U	0.5 U	NA	NA	NA	NA	NA	NA	260 U
	11/14/2011	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	620 V
	10/24/2012	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NA
	3/26/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
MW-7	5/31/1994	**3.1**	1	2.8	3.6	BDL	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	**32.9**	10.1	6.6	15.7	25.1	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	<.5	<.5	<.5	BDL	<.5	NA	NA	NA	NA	NA	NA	NS
	2/13/2003	**51**	8.4	21	16	42	NA	NA	NA	NA	NA	NA	NS
	8/25/2003	<1.0	<1.0	<1.0	<1.0	6	NA	NA	NA	NA	NA	NA	NS
	2/20/2004	<1.0	<1.0	<1.0	<1.0	2.6	NA	NA	NA	NA	NA	NA	NS
	12/22/2004	**13**	4.5	18	**50**	<1	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	**2.9**	2.5V	1.1	6.2	<0.46U	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	**1.5**	3.3	0.77 IV	2.25 I	.40 I	NA	NA	NA	NA	NA	NA	NS

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
MW-8/8R	5/31/1994	**4100**	**19440**	**2740**	**11640**	**500**	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	**3000**	**16700**	**2070**	**11200**	**601**	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	**170**	8.9	19	**34.6**	**150**	NA	NA	NA	NA	NA	NA	NS
	1/19/2000	**86**	8.7	12	**20**	**88**	NA	NA	NA	NA	NA	NA	NS
	7/14/2000	**280**	30	**55**	**101**	**180**	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	**510**	**1100**	**630**	**2310**	**180**	NA	NA	NA	NA	NA	NA	NS
	11/27/2001	**250**	14	**53**	**430**	**130**	NA	NA	NA	NA	NA	NA	NS
	2/13/2003	**210**	**530**	**250**	**960**	**71**	NA	NA	NA	NA	NA	NA	NS
	8/25/2003	**281**	**731**	**149**	**672**	**59.4**	NA	NA	NA	NA	NA	NA	NS
	2/20/2004	**640**	**1300**	**670**	**2500**	**190**	NA	NA	NA	NA	NA	NA	NS
	12/22/2004	**360**	**840**	**340**	**1260**	**35**	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	**24**	**62V**	20	**88**	2.6	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	**5.5**	2.1	0.66 IV	1.97 I	1.5	NA	NA	NA	NA	NA	NA	NS
	3/13/2008	**820**	**550**	**680**	**2000**	92	NA	NA	NA	NA	NA	NA	NS
	6/9/2010	**53**	3.9	**46**	**55**	3.9	NA	NA	NA	NA	NA	NA	NS
	10/11/2010	**79**	1.4	**58**	**42**	12.0	NA	NA	NA	NA	NA	NA	NS
	12/13/2010	**49**	0.45 I	15	3.4	10	NA	NA	NA	NA	NA	NA	NS
	5/11/2011	**30.9**	2.6	40	21.6	5.0	NA	NA	NA	NA	NA	NA	850
	11/14/2011	**133**	3.6	**192**	**110**	**20.4**	NA	NA	NA	NA	NA	NA	1700 V
	7/20/2012	**240**	**57.4**	**327**	**425**	**141**	NA	NA	NA	NA	NA	NA	NA
	10/24/2012	**69.9**	0.66 I	15.7	7.4	6.7	NA	NA	NA	NA	NA	NA	NA
	3/26/2013	**60.7**	0.48 I	**76.6**	**20.4**	0.5 U	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	**21.7**	0.51 I	**37.6**	9.4	0.5 U	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	**34.6**	0.65 I	**32.3**	9.2	0.5 U	NS	NS	NS	NS	NS	NS	NS
	8/20/2014	**23.7**	**47.6**	**36.8**	**61**	2.4	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	**DRY**											
	6/23/2017	**DRY**											
MW-8I	7/20/2012	**4.8**	1.4	3.8	6.7	2.9	NA	NA	NA	NA	NA	NA	890
	10/24/2012	**4.4**	0.15 I	0.22 U	0.5 U	2.7	NA	NA	NA	NA	NA	NA	NA
	7/9/2013	**59.4**	0.19 I	9.4	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	**68.3**	0.14 U	15	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	8/20/2014	**31**	0.28 I	12.9	0.5 U	1.2	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	**125**	1.07	**123**	14.6	5.05	NS	NS	NS	NS	NS	NS	NS
	6/7/2016	**110**	2.2 U	**160**	**21**	5.2	NS	NS	NS	NS	NS	NS	NS
	12/13/2016	**94.7**	0.510 i	**141**	**32.5**	6.22	NS	NS	NS	NS	NS	NS	NS
	6/23/2017	**5.05**	0.400 U	0.830 I	0.800 U	3.86	NS	NS	NS	NS	NS	NS	NS

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
MW-9	5/31/1994	BDL	BDL	BDL	BDL	BDL	0.01 U	1 U	NS	NS	NS	10	NS
	10/13/1994	BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	<0.5	<0.5	<0.5	BDL	<0.5	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	<1.0	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	11/27/2001	<1.0	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	0.37I	.70IV	.40I	1.71I	<0.46U	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	0.88 U	1.4	0.48 IV	1.42 I	0.46 I	NA	NA	NA	NA	NA	NA	NS
	5/11/2011	6.8	2.0	17.6	6.1	0.50 U	NA	NA	NA	NA	NA	NA	NS
	11/14/2011	0.17 U	0.14 U	0.22 U	0.5 U	0.50 U	NA	NA	NA	NA	NA	NA	NS
	7/20/2012	0.17 U	0.14 U	0.22 U	0.5 U	0.50 U	NA	NA	NA	NA	NA	NA	NS
	10/24/2012	0.17 U	0.14 U	0.22 U	0.5 U	0.50 U	NA	NA	NA	NA	NA	NA	NS
	3/26/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
MW-10	7/6/1994	BDL	1	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	**5**	BDL	BDL	1.7	40.5	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	**4.2**	BDL	BDL	3.9	29.7	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	<.5	<.5	<.5	BDL	<.5	NA	NA	NA	NA	NA	NA	NS
	2/13/2003	**9.2**	35	11	**45**	<1.0	NA	NA	NA	NA	NA	NA	NS
	8/25/2003	**3.3**	1.2	2.4	19.8	BDL	NA	NA	NA	NA	NA	NA	NS
	2/20/2004	**1.2**	1.6	1.4	4.6	<1.0	NA	NA	NA	NA	NA	NA	NS
	12/22/2004	**3.8**	17	13	43	<1	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	<0.32U	1.1V	0.61I	3.2I	<0.46U	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	0.88 U	0.71 I	0.43 U	1.27 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
MW-11D	7/6/1994	BDL	BDL	BDL	BDL	BDL	0.01 U	1 U	NS	NS	NS	12	NS
MW-41 *	7/6/1994	1 U	1 U	1 U	1 U	1 U	0.01 U	1 U	NS	NS	NS	5 U	NS
	10/13/1994	1 U	1 U	1 U	1 U	1 U	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.88 U	5.9	0.94 IV	4.6	19	NA	NA	NA	NA	NA	NA	NS
	3/13/2008	0.88 U	0.44 U	0.43 U	1.3 U	17	NA	NA	NA	NA	NA	NA	NS
MW-12	7/6/1994	**40.6**	**98**	**52.4**	**359**	1.2	0.01 U	1 U	NS	NS	NS	5 U	NS
	10/13/1994	**66**	**185**	**89**	**645**	21	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	**330**	<10	**140**	BDL	120	NA	NA	NA	NA	NA	NA	NS
	1/19/2000	**120**	<0.5	21	1.12	59	NA	NA	NA	NA	NA	NA	NS
	7/14/2000	**78**	1	2.2	BDL	50	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	**220**	**360**	**120**	**790**	61	NA	NA	NA	NA	NA	NA	NS
	11/27/2001	**150**	1.4	**64**	**23**	37	NA	NA	NA	NA	NA	NA	NS
	2/13/2003	**160**	**89**	**42**	**130**	28	NA	NA	NA	NA	NA	NA	NS
	8/25/2003	**320**	**145**	**234**	**277**	52.3	NA	NA	NA	NA	NA	NA	NS
	2/20/2004	**170**	8.5	**130**	**34**	51	NA	NA	NA	NA	NA	NA	NS
	12/22/2004	**290**	93	**420**	**280**	22	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	**33**	19V	**43**	**51**	2.7	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	**14**	1.7	0.45 IV	4.5	21	NA	NA	NA	NA	NA	NA	NS
	6/9/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
	10/11/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.23 I	NA	NA	NA	NA	NA	NA	NS
	12/13/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.86 I	NA	NA	NA	NA	NA	NA	NS

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
MW-13	7/6/1994	BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	**1.5**	1.1	BDL	1	17.7	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	BDL	BDL	BDL	BDL	8.1	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	<0.5	<0.5	<0.5	BDL	<0.5	NA	NA	NA	NA	NA	NA	NS
	1/19/2000	**6.8**	<0.5	<0.5	BDL	7.3	NA	NA	NA	NA	NA	NA	NS
	7/14/2000	<1.0	<1.0	<1.0	BDL	3.7	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	<1.0	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	11/27/2001	<1.0	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	0.88 U	0.44 U	0.43 U	1.27	0.27 I	NA	NA	NA	NA	NA	NA	NS
	6/9/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
	10/11/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.28 I	NA	NA	NA	NA	NA	NA	NS
	12/13/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.61 I	NA	NA	NA	NA	NA	NA	NS
MW-14	7/6/1994	**192**	BDL	BDL	3.7	4.6	0.01 U	1 U	NS	NS	NS	8	NS
	10/13/1994	**67.2**	BDL	BDL	1.6	4.4	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	<0.5	<0.5	<0.5	BDL	<0.5	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	0.88 U	0.44 U	0.43 U	1.27 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
MW-15	7/6/1994	BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	**31.2**	BDL	BDL	1.1	BDL	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	**10.8**	BDL	BDL	11.9	4.6	NS	NS	NS	NS	NS	NS	NS
	7/14/1999	**25**	<0.5	<0.5	BDL	39	NA	NA	NA	NA	NA	NA	NS
	11/27/2001	<1.0	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	2/13/2003	**4.5**	20	7.4	32	1.1	NA	NA	NA	NA	NA	NA	NS
	8/25/2003	**4.1**	3.5	1.5	5.2	2.4	NA	NA	NA	NA	NA	NA	NS
	2/20/2004	**2.7**	2.0	1.3	22	1.4	NA	NA	NA	NA	NA	NA	NS
	12/22/2004	<1	<1	<1	<1	1.1	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	**2.9**	7.8V	1.6	8.8	0.81I	NA	NA	NA	NA	NA	NA	NS
	2/7/2007	**24**	0.62 I	0.43 U	1.27 U	12	NA	NA	NA	NA	NA	NA	NS
	6/9/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
	10/11/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
	12/13/2010	0.96 I	0.44 U	0.43 U	1.3 U	1.3	NA	NA	NA	NA	NA	NA	NS
	1/8/2014	0.17 U	0.14 U	0.22 U	0.5 U	1.1	NS	NS	NS	NS	NS	NS	NS
MW-16	8/5/1994	**2.9**	5	BDL	BDL	BDL	0.01 U	1 U	NS	NS	NS	5 U	NS
	10/13/1994	BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	<0.5	<0.5	<0.5	BDL	<0.5	NA	NA	NA	NA	NA	NA	NS
	6/9/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.20 U	NA	NA	NA	NA	NA	NA	NS
	5/11/2011	**2.3**	0.63 I	8.3	3.8	0.50 U	NA	NA	NA	NA	NA	NA	NS
	11/14/2011	0.17 U	0.16 I	0.22 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NS
	7/20/2012	0.28 I	0.14 U	0.22 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NS
	10/24/2012	0.17 U	0.14 U	0.22 U	0.5 U	0.50 U	NA	NA	NA	NA	NA	NA	NS
	3/26/2013	0.19 I	0.4 I	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
MW-17	8/5/1994	**1.6**	4.6	BDL	3.4	BDL	0.01 U	1 U	NS	NS	NS	5 U	NS
	10/13/1994	BDL	BDL	BDL	3.9	BDL	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	**10**	<0.5	<0.5	BDL	6	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	<1.0	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	11/27/2001	**2**	<1.0	<1.0	BDL	<1.0	NA	NA	NA	NA	NA	NA	NS
	2/18/2003	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NS
	9/16/2005	**3.0**	1.5V	2.6	4.6	<0.46U	NA	NA	NA	NA	NA	NA	NS
	6/9/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.37 I	NA	NA	NA	NA	NA	NA	NS
	10/11/2010	0.88 U	0.44 U	0.43 U	1.3 U	0.56 I	NA	NA	NA	NA	NA	NA	NS
	12/13/2010	**2.0**	0.44 U	0.43 U	1.3 U	2.1	NA	NA	NA	NA	NA	NA	NS
	5/14/2011	0.17 U	0.14 U	0.22 U	0.28 U	0.5 U	NA	NA	NA	NA	NA	NA	NS
	11/14/2011	0.24 I	0.14 U	0.22 U	0.57 I	1.2	NA	NA	NA	NA	NA	NA	NS
	7/20/2012	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NA	NA	NA	NA	NA	NA	NS
	10/24/2012	0.56	0.14 U	0.22 U	0.5 U	0.91 I	NA	NA	NA	NA	NA	NA	NS
	3/26/2013	0.26 I	0.14 U	0.22 U	0.5 U	1.5	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
MW-18	9/14/1994	BDL	BDL	BDL	BDL	BDL	0.095	1 U	NS	NS	NS	5 U	NS
	10/5/1994	NS	NS	NS	NS	NS	0.01 U	NS	NS	NS	NS	NS	NS
	10/13/1994	BDL	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	<0.5	<0.5	<0.5	BDL	<0.5	NA	NA	NA	NA	NA	NA	NS
MW-19	11/9/1994	**1.3**	BDL	BDL	BDL	BDL	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	**8.4**	<0.5	<0.5	BDL	27	NA	NA	NA	NA	NA	NA	NS
	1/19/2000	**2.2**	<0.5	<0.50	BDL	16	NA	NA	NA	NA	NA	NA	NS
	7/14/2000	**1.3**	<1.0	<1.0	BDL	12	NA	NA	NA	NA	NA	NA	NS
	10/11/2001	**6.6**	22	6.8	**27.6**	1.6	NA	NA	NA	NA	NA	NA	NS
	2/18/2003	<1.0	<1.0	<1.0	<1.0	0.9	NA	NA	NA	NA	NA	NA	NS
MW-20I	3/26/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	0.400U	0.400U	0.400U	0.800U	0.400U	NS	NS	NS	NS	NS	NS	NS
	6/7/2016	0.34 U	0.45 U	0.26 U	1.3 U	0.41 U	NS	NS	NS	NS	NS	NS	NS
	12/13/2016	0.400 U	0.400 U	0.400 U	0.800 U	0.400 U	NS	NS	NS	NS	NS	NS	NS
	6/23/2017	0.400 U	0.400 U	0.400 U	0.800 U	0.400 U	NS	NS	NS	NS	NS	NS	NS
MW-21D	7/9/2013	0.17 U	0.32 I	0.22 U	0.69 I	0.5 U	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS

TABLE 4A: GROUNDWATER ANALYTICAL SUMMARY - VOCs and Metals

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE	EDB	1,2-Di-chloroethane	Total Arsenic	Total Cadmium	Total Chromium	Total Lead	TRPHs
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
GCTLs		1**	40**	30**	20**	20	0.02**	3**	10**	5**	100**	15**	5,000
NADCs		100	400	300	200	200	2	300	100	50	1,000	150	50,000
Location	**Date**												
MW-22I	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	0.400U	0.400U	0.400U	0.800U	0.400U	NS	NS	NS	NS	NS	NS	NS
	6/7/2016	0.34 U	0.45 U	0.26 U	1.3 U	0.41 U	NS	NS	NS	NS	NS	NS	NS
	12/13/2016	0.400 U	0.400 U	0.400 U	0.800 U	0.400 U	NS	NS	NS	NS	NS	NS	NS
	6/23/2017	0.400 U	0.400 U	0.400 U	0.800 U	0.400 U	NS	NS	NS	NS	NS	NS	NS
MW-23I	7/9/2013	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	0.17 U	0.14 U	0.22 U	0.5 U	0.5 U	NS	NS	NS	NS	NS	NS	NS

Notes:

NA = Not Available

NS = Not Sampled

GCTLs = Groundwater Cleanup Target Levels as specified in Table I of Chapter 62-777, F.A.C.

** = As Provided in Chapter 62-550, F.A.C.

If an analyte is not detected, report the method detection limit [i.e., 0.01 U or ND (0.01); BDL or < 0.01 are not acceptable].

Freshwater Surface Water [FSW], Marine Surface Water [MSW] and Groudnwater of Low Yield/Poor Quality (LY/PQ) CTLs should be added to the base of the table as applicable

I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U = The compound was analyzed for but not detected.

V = Indicates that the analyte was detected in both the sample and the associated method blank.

*** MW-25 was the duplicate sample collected from MW-5 (5/31/1994)**

*** MW-55 was the duplicate sample collected from MW-5 (10/13/1994)**

*** MW-41 was the duplicate sample collected from MW-11D (7/6/1994)**

TABLE 4B: GROUNDWATER ANALYTICAL SUMMARY - PAHs

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acen-aphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Phenan-threne	Pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		14	28	28	20	210	2,100	210	280	280	210	210
NADCs		140	280	280	200	2,100	21,000	2,100	2,800	2,800	2,100	2,100
Location	**Date**											
CW-1	5/31/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/14/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-2	5/31/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-3	5/31/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/14/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CW-4	5/31/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/14/1994	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-5/5R	5/31/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/31/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/5/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	**200**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	**160**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	**180**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	**220**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	**210**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	**260**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/27/2001	**320**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	**100**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/25/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	130	32	58	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	**21**	4.4	3.5	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	**32**	7.4	12	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	12/13/2010	**23**	5.3	9.3	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	5/11/2011	**31.2**	3.5	4.5	0.033	0.021	0.021	0.021	0.021	0.051	0.021	0.021
	11/14/2011	**27.7 JM3**	3.6	6.4	0.046 I	0.02 U	0.02 U	0.02 U	0.02 U	0.023 I	0.02 U	0.02 U
	7/20/2012	6.9	0.84 J3	2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	4.4	0.56	0.29	0.02 U	0.02 U	0.02 U	0.02 J3U	0.02 U	0.02 U	0.02 U	0.02 U
	3/26/2013	3.1	0.51	0.74	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
	7/9/2013	0.43	0.054	0.053	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	0.32	0.067	0.072	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U
	8/20/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	DRY										
	6/23/2017	DRY										

TABLE 4B: GROUNDWATER ANALYTICAL SUMMARY - PAHs

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acen-aphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Phenan-threne	Pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		14	28	28	20	210	2,100	210	280	280	210	210
NADCs		140	280	280	200	2,100	21,000	2,100	2,800	2,800	2,100	2,100
Location	Date											
MW-5I	7/20/2012	3.8	0.49 J3	0.37	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	**50.5**	16.3	23.8	0.057	0.02 U	0.02 U	0.02 J3U	0.02 U	0.059	0.02 U	0.02 U
	7/9/2013	**126**	22.1	22.6	0.13	0.02 U	0.02 U	0.02 U	0.02 U	0.074	0.028 I	0.02 U
	1/8/2014	**78.9**	15.2	25.9	0.063	0.022 I	0.02 U	0.02 U	0.02 U	0.062	0.061	0.02 U
	8/20/2014	**35.6**	9.8	11.4	0.66	0.02 U	0.02 U	0.02 U	0.02 U	0.045 I	0.058 J3R	0.02 U
	12/8/2015	**4.63**	0.989	0.499	0.023U	0.023U	0.023U	0.014U	0.023U	0.023U	0.023U	0.023U
	6/7/2016	0.26	0.057 I	0.055 U	0.036 U	0.041 U	0.037 U	0.05 U	0.039 U	0.033 U	0.039 U	0.038 U
	12/13/2016	0.433	0.0860 i	0.122	0.0230 U	0.0230 U	0.0230 U	0.0140 U	0.0230 U	0.0230 U	0.0230 U	0.0230 U
	6/23/2017	0.168 I	0.100 U	0.100 U	0.0500 U	0.0500 U	0.0500 U	0.0310 I	0.0500 U	0.0500 U	0.0500 U	0.0500 U
MW-6/6R	5/31/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/5/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	<1.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.75 I	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	5/11/2011	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/14/2011	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-7	5/31/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	4.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/25/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.44 I	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
MW-8/8R	5/31/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	**20**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	**37**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	**61**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	**23**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	3.4	0.75 U	0.71 I	NA	NA	NA	NA	NA	NA	NA	NA
	3/13/2008	**190**	31	**67**	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	13	3.8	5.4	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	**25**	7.5	15	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	12/13/2010	12	4.1	6.8	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	5/11/2011	13.4	3.1	5.5	0.037	0.021	0.021	0.021	0.021	0.056	0.26	0.021
	11/14/2011	**66.5 J3M**	20.8	**42.7**	0.067	0.044 I	0.02 U	0.02 U	0.02 U	0.079	0.088 V	0.02 U
	7/20/2012	**123**	**29.4 J3**	**79.5**	0.067	0.031 I	0.02 U	0.02 U	0.02 U	0.076	0.09	0.02 U
	10/24/2012	**40.2**	12.6	21.9	0.02 U	0.02 U	0.02 U	0.02 J3U	0.02 U	0.033 I	0.023 I	0.02 U
	3/26/2013	**31.1**	10.3	17.1	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.04 I	0.03 I	0.021 U
	7/9/2013	0.077	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	**26.1**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	8/20/2014	4.5	1.6	0.54	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 J3RU	0.02 U
	12/8/2015	DRY										
	6/23/2017	DRY										

TABLE 4B: GROUNDWATER ANALYTICAL SUMMARY - PAHs

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acen-aphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Phenan-threne	Pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		14	28	28	20	210	2,100	210	280	280	210	210
NADCs		140	280	280	200	2,100	21,000	2,100	2,800	2,800	2,100	2,100
Location	Date											
MW-8I	7/20/2012	0.03 I	0.02 J3U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	2.2	0.05 I	0.049 I	0.02 U	0.02 U	0.02 U	0.02 J3U	0.02 U	0.033 I	0.023 I	0.02 U
	7/9/2013	**27.9**	8	4.1	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.053	0.02 U	0.02 U
	1/8/2014	**37.3**	11.5	20.2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.06	0.052	0.02 U
	8/20/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 J3RU	0.02 U
	12/8/2015	**63.9**	19.7	**30.6**	0.034i	0.023U	0.023U	0.014U	0.023U	0.095	0.081	0.023U
	6/7/2016	**65**	17	**31**	0.035 U	0.04 U	0.036 U	0.048 U	0.037 U	0.032 U	0.063 I	0.036 U
	12/13/2016	**73.9**	23.8	**40**	0.0440 i	0.0230 U	0.0230 U	0.0140 U	0.0230 U	0.098	0.058	0.0230 U
	6/23/2017	0.0470 U	0.0470 U	0.0470 U	0.0230 U	0.0230 U	0.0230 U	0.0140 U	0.0230 U	0.0230 U	0.0230 U	0.0230 U
MW-9	5/31/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	<2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	<2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.43 U	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
	7/20/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/26/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-10	7/6/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	0.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.43 U	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
MW-11D	7/6/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.45 I	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
	3/13/2008	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-12	7/6/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	<2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	7.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	6.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-13	7/6/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	<2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	<2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	<2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	<2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/7/2007	0.43 U	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	12/13/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U

TABLE 4B: GROUNDWATER ANALYTICAL SUMMARY - PAHs

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acen-aphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Phenan-threne	Pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		14	28	28	20	210	2,100	210	280	280	210	210
NADCs		140	280	280	200	2,100	21,000	2,100	2,800	2,800	2,100	2,100
Location	Date											
MW-14	7/6/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.43 U	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	7/6/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/27/2001	<2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	0.43 U	0.75 U	0.45 U	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-16	8/5/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/9/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	7/20/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/26/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-17	8/5/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	<2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	4.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/18/2003	<4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/2005	<.36U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.43 U	0.75 U	0.45 U	0.38 U	0.63 U	0.65 U	0.59 U	0.57 U	0.58 U	0.55 U	0.63 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/20/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/26/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/9/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-18	9/14/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/5/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE 4B: GROUNDWATER ANALYTICAL SUMMARY - PAHs

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Acen-aphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Phenan-threne	Pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		14	28	28	20	210	2,100	210	280	280	210	210
NADCs		140	280	280	200	2,100	21,000	2,100	2,800	2,800	2,100	2,100
Location	**Date**											
MW-19	11/9/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	<2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	<2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	<2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/18/2003	<4.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-20I	3/26/2013	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	0.077i	0.047U	0.054i	0.023U	0.023U	0.023U	0.026i	0.023U	0.023U	0.023U	0.023U
	6/7/2016	0.049 U	0.051 U	0.054 U	0.035 U	0.04 U	0.036 U	0.048 U	0.038 U	0.032 U	0.038 U	0.036 U
	12/13/2016	0.0470 U	0.0470 U	0.0470 U	0.0230 U	0.0230 U	0.0230 U	0.0140 U	0.0230 U	0.0230 U	0.0230 U	0.0230 U
	6/23/2017	0.0470 U	0.0470 U	0.0470 U	0.0230 U	0.0230 U	0.0230 U	0.0170 I	0.0230 U	0.0230 U	0.0230 U	0.0230 U
MW-21D	7/9/2013	0.16	0.034 I	0.077	0.074	0.053	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-22I	7/9/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	0.047U	0.047U	0.047U	0.023U	0.023U	0.023U	0.015i	0.023U	0.023U	0.023U	0.023U
	6/7/2016	0.049 U	0.051 U	0.054 U	0.035 U	0.04 U	0.036 U	0.049 U	0.038 U	0.032 U	0.038 U	0.037 U
	12/13/2016	0.125	0.0470 U	0.0500 i	0.0230 U	0.0230 U	0.0230 U	0.0140 U	0.0230 U	0.0230 U	0.0230 U	0.0230 U
	6/23/2017	0.0470 U	0.0470 U	0.0470 U	0.0230 U	0.0230 U	0.0230 U	0.0270 I	0.0230 U	0.0230 U	0.0230 U	0.0230 U
MW-23I	7/9/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:

NA = Not Available
NS = Not Sampled
GCTLs = Groundwater Cleanup Target Levels as specified in Table I of Chapter 62-777, F.A.C.
** = As Provided in Chapter 62-550, F.A.C.
If an analyte is not detected, report the method detection limit [i.e., 0.01 U or ND (0.01); BDL or < 0.01 are not acceptable].
Freshwater Surface Water [FSW], Marine Surface Water [MSW] and Groundnwater of Low Yield/Poor Quality (LY/PQ) CTLs should be added to the base of the table as applicable
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U = The compound was analyzed for but not detected.
V = Indicates that the analyte was detected in both the sample and the associated method blank.

TABLE 4C: GROUNDWATER ANALYTICAL SUMMARY - PAHs (Carcinogens)

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzo (a) pyrene	Benzo (a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno(1,2,3-cd) pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		0.2**	0.05[a]	0.05[a]	0.5	4.8	0.005[a]	0.05[a]
NADCs		20	5	5	50	480	0.5	5
Location	Date							
CW-1	5/31/1994	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA
	9/14/1994	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA
CW-2	5/31/1994	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA
	9/14/2003	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA
CW-3	5/31/1994	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA
	9/14/2003	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA
CW-4	5/31/1994	NA	NA	NA	NA	NA	NA	NA
	8/5/1994	NA	NA	NA	NA	NA	NA	NA
	9/14/1994	NA	NA	NA	NA	NA	NA	NA
	abandonded	NA	NA	NA	NA	NA	NA	NA
MW-5/5R	5/31/1994	NS	NS	NS	NS	NS	NS	NS
	5/31/1994	NS	NS	NS	NS	NS	NS	NS
	8/5/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	NS	NS	NS	NS	NS	NS	NS
	11/27/2001	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	NS	NS	NS	NS	NS	NS	NS
	8/25/2003	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	12/13/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	5/11/2011	0.021	0.021	0.021	0.021	0.021	0.021	0.021
	11/14/2011	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	7/20/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	3/26/2013	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U
	8/20/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	DRY						
	6/23/2017	DRY						

TABLE 4C: GROUNDWATER ANALYTICAL SUMMARY - PAHs (Carcinogens)

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzo (a) pyrene	Benzo (a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno(1,2,3-cd) pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		0.2**	0.05[a]	0.05[a]	0.5	4.8	0.005[a]	0.05[a]
NADCs		20	5	5	50	480	0.5	5
Location	Date							
MW-5I	7/20/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	8/20/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	0.014U	0.023U	0.014U	0.014U	0.023U	0.0048U	0.014U
	6/7/2016	0.039 U	0.034 U	0.042 U	0.051 U	0.035 U	0.038 U	0.033 U
	12/13/2016	0.0140 U	0.0230 U	0.0150 i	0.0140 U	0.0230 U	0.00480 U	0.0140 U
	6/23/2017	0.0300 U	0.0500 U	0.0350 I	0.0300 U	0.0500 U	0.0100 U	0.0300 U
MW-6/6R	5/31/1994	NS	NS	NS	NS	NS	NS	NS
	8/5/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS
	5/11/2011	NS	NS	NS	NS	NS	NS	NS
	11/14/2011	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NA	NA	NA	NA	NA	NA	NA
MW-7	5/31/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/2003	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	NS	NS	NS	NS	NS	NS	NS
	8/25/2003	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
MW-8/8R	5/31/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	3/13/2008	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	12/13/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	5/11/2011	0.021	0.021	0.021	0.021	0.021	0.021	0.021
	11/14/2011	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	7/20/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	3/26/2013	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	8/20/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	DRY						
	6/23/2017	DRY						

TABLE 4C: GROUNDWATER ANALYTICAL SUMMARY - PAHs (Carcinogens)

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Location	Date	Benzo (a) pyrene (µg/L)	Benzo (a) anthracene (µg/L)	Benzo(b) fluoranthene (µg/L)	Benzo(k) fluoranthene (µg/L)	Chrysene (µg/L)	Dibenz(a,h) anthracene (µg/L)	Indeno(1,2,3-cd) pyrene (µg/L)
GCTLs		0.2**	0.05[a]	0.05[a]	0.5	4.8	0.005[a]	0.05[a]
NADCs		20	5	5	50	480	0.5	5
MW-8I	7/20/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	10/24/2012	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	8/20/2014	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	0.014U	0.023U	0.014U	0.014U	0.023U	0.0048U	0.014U
	6/7/2016	0.037 U	0.033 U	0.041 U	0.049 U	0.033 U	0.036 U	0.032 U
	12/13/2016	0.0140 U	0.0230 U	0.0140 U	0.0140 U	0.0230 U	0.00480 U	0.0140 U
	6/23/2017	0.0140 U	0.0230 U	0.0140 U	0.0140 U	0.0230 U	0.00480 U	0.0140 U
MW-9	5/31/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	NA	NA	NA	NA	NA	NA	NA
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	7/20/2012	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NS	NS	NS	NS	NS	NS	NS
MW-10	7/6/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	2/13/2003	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
MW-11D	7/6/1994	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	3/13/2008	NS	NS	NS	NS	NS	NS	NS
MW-12	7/6/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS

TABLE 4C: GROUNDWATER ANALYTICAL SUMMARY - PAHs (Carcinogens)

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

Sample		Benzo (a) pyrene	Benzo (a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno(1,2,3-cd) pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		0.2**	0.05[a]	0.05[a]	0.5	4.8	0.005[a]	0.05[a]
NADCs		20	5	5	50	480	0.5	5
Location	**Date**							
MW-13	7/6/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	NA	NA	NA	NA	NA	NA	NA
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	12/13/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
MW-14	7/6/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
MW-15	7/6/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	10/24/1994	NS	NS	NS	NS	NS	NS	NS
	7/14/1999	NS	NS	NS	NS	NS	NS	NS
	11/27/2001	NA	NA	NA	NA	NA	NA	NA
	2/13/2003	NA	NA	NA	NA	NA	NA	NA
	8/25/2003	NS	NS	NS	NS	NS	NS	NS
	2/20/2004	NS	NS	NS	NS	NS	NS	NS
	12/22/2004	NS	NS	NS	NS	NS	NS	NS
	9/16/2005	NS	NS	NS	NS	NS	NS	NS
	2/7/2007	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS
MW-16	8/5/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	7/20/2012	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NS	NS	NS	NS	NS	NS	NS
MW-17	8/5/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS
	10/11/2001	NA	NA	NA	NA	NA	NA	NA
	11/27/2001	NA	NA	NA	NA	NA	NA	NA
	2/18/2003	NA	NA	NA	NA	NA	NA	NA
	9/16/2005	NA	NA	NA	NA	NA	NA	NA
	6/9/2010	0.065 U	0.083 U	0.083 U	0.082 U	0.48 U	0.090 U	0.10 U
	10/11/2010	NS	NS	NS	NS	NS	NS	NS
	7/20/2012	NS	NS	NS	NS	NS	NS	NS
	10/24/2012	NS	NS	NS	NS	NS	NS	NS

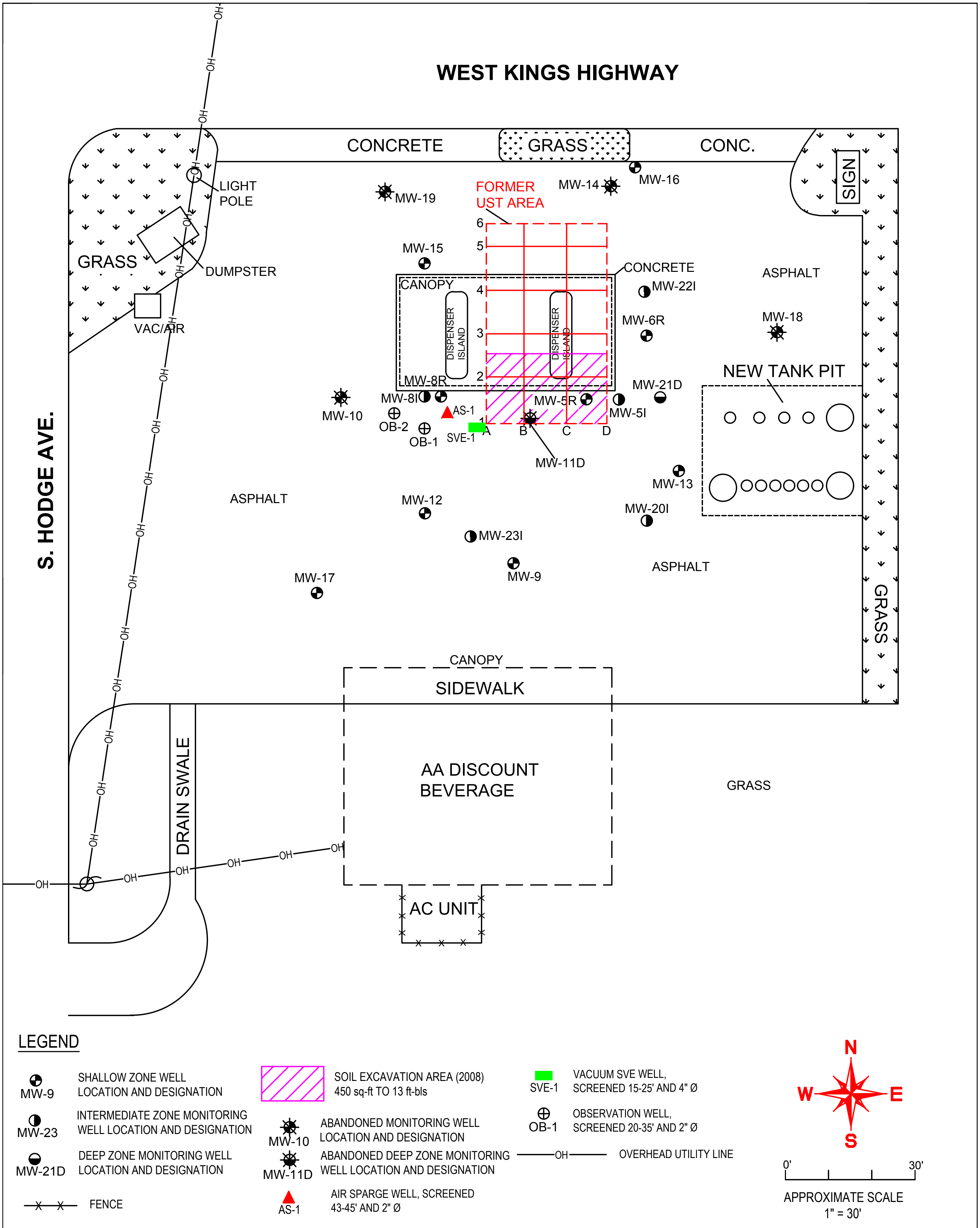
TABLE 4C: GROUNDWATER ANALYTICAL SUMMARY - PAHs (Carcinogens)

Facility Name: AA Discount **FDEP Facility ID #:** 60/8516863

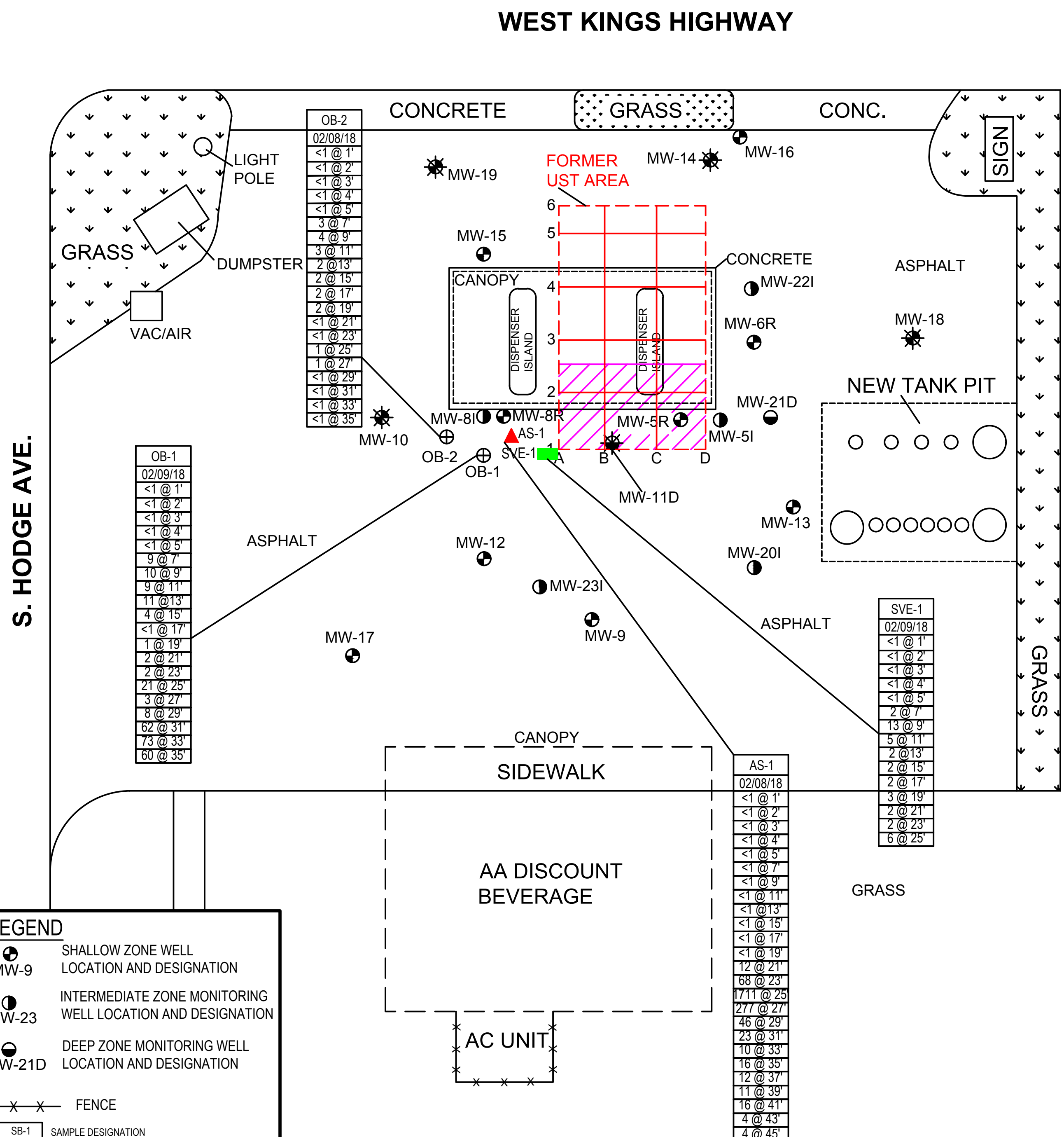
Sample		Benzo (a) pyrene	Benzo (a) anthracene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno(1,2,3-cd) pyrene
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
GCTLs		0.2**	0.05[a]	0.05[a]	0.5	4.8	0.005[a]	0.05[a]
NADCs		20	5	5	50	480	0.5	5
Location	**Date**							
MW-18	9/14/1994	NS	NS	NS	NS	NS	NS	NS
	10/5/1994	NS	NS	NS	NS	NS	NS	NS
	10/13/1994	NS	NS	NS	NS	NS	NS	NS
	7/14/2000	NS	NS	NS	NS	NS	NS	NS
MW-19	11/9/1994	NS	NS	NS	NS	NS	NS	NS
	7/28/1999	NS	NS	NS	NS	NS	NS	NS
	1/19/2000	NA	NA	NA	NA	NA	NA	NA
	7/14/2000	NA	NA	NA	NA	NA	NA	NA
	10/11/2001	NA	NA	NA	NA	NA	NA	NA
	2/18/2003	NA	NA	NA	NA	NA	NA	NA
MW-20I	3/26/2013	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U	0.021 U
	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	12/8/2015	0.018 I	0.023U	0.036 I	0.015I	0.024 I	0.0048U	0.030 I
	6/7/2016	0.038 U	0.033 U	0.041 U	0.049 U	0.034 U	0.037 U	0.032 U
	12/13/2016	0.0140 U	0.0230 U	0.0140 U	0.0140 U	0.0230 U	0.00480 U	0.0140 U
	6/23/2017	0.0140 U	0.0230 U	0.0170 I	0.0140 U	0.0230 U	0.00490 I	0.0140 U
MW-21D	7/9/2013	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
	1/8/2014	NS	NS	NS	NS	NS	NS	NS
MW-22I	7/9/2013	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	NS	NS	NS	NS	NS	NS	NS
	12/8/2015	0.014U	0.023U	0.014U	0.014U	0.023U	0.061	0.015 I
	6/7/2016	0.038 U	0.033 U	0.041 U	0.049 U	0.034 U	0.037 U	0.032 U
	12/13/2016	0.0140 U	0.0230 U	0.0140 U	0.0140 U	0.0230 U	0.00480 U	0.0140 U
	6/23/2017	0.0150 I	0.0230 U	0.0330 I	0.0140 U	0.0230 U	0.00630 I	0.0250 I
MW-23I	7/9/2013	NS	NS	NS	NS	NS	NS	NS
	1/8/2014	NS	NS	NS	NS	NS	NS	NS

Notes:

NA = Not Available
NS = Not Sampled
GCTLs = Groundwater Cleanup Target Levels as specified in Table I of Chapter 62-777, F.A.C.
** = As Provided in Chapter 62-550, F.A.C.
If an analyte is not detected, report the method detection limit [i.e., 0.01 U or ND (0.01); BDL or < 0.01 are not acceptable].
Freshwater Surface Water [FSW], Marine Surface Water [MSW] and Groudnwater of Low Yield/Poor Quality (LY/PQ) CTLs should be added to the base of the table as applicable
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U = The compound was analyzed for but not detected.
V = Indicates that the analyte was detected in both the sample and the associated method blank.



MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	SITE MAP	FIGURE 1 PROJECT No. M50033.06



OB-2
02/08/18
<1 @ 1'
<1 @ 2'
<1 @ 3'
<1 @ 4'
<1 @ 5'
3 @ 7'
4 @ 9'
3 @ 11'
2 @13'
2 @ 15'
2 @ 17'
2 @ 19'
<1 @ 21'
<1 @ 23'
1 @ 25'
1 @ 27'
<1 @ 29'
<1 @ 31'
<1 @ 33'
<1 @ 35'

OB-1
02/09/18
<1 @ 1'
<1 @ 2'
<1 @ 3'
<1 @ 4'
<1 @ 5'
9 @ 7'
10 @ 9'
9 @ 11'
11 @13'
4 @ 15'
<1 @ 17'
1 @ 19'
2 @ 21'
2 @ 23'
21 @ 25'
3 @ 27'
8 @ 29'
62 @ 31'
73 @ 33'
60 @ 35'

SVE-1
02/09/18
<1 @ 1'
<1 @ 2'
<1 @ 3'
<1 @ 4'
<1 @ 5'
2 @ 7'
13 @ 9'
5 @ 11'
2 @13'
2 @ 15'
2 @ 17'
3 @ 19'
2 @ 21'
2 @ 23'
6 @ 25'

AS-1
02/08/18
<1 @ 1'
<1 @ 2'
<1 @ 3'
<1 @ 4'
<1 @ 5'
<1 @ 7'
<1 @ 9'
<1 @ 11'
<1 @13'
<1 @ 15'
<1 @ 17'
<1 @ 19'
12 @ 21'
68 @ 23'
1711 @ 25'
277 @ 27'
46 @ 29'
23 @ 31'
10 @ 33'
16 @ 35'
12 @ 37'
11 @ 39'
16 @ 41'
4 @ 43'
4 @ 45'

LEGEND

MW-9 — SHALLOW ZONE WELL LOCATION AND DESIGNATION

MW-23 — INTERMEDIATE ZONE MONITORING WELL LOCATION AND DESIGNATION

MW-21D — DEEP ZONE MONITORING WELL LOCATION AND DESIGNATION

FENCE

SB-1	SAMPLE DESIGNATION
02/09/18	SAMPLE DATE
0	NET OVA READING (ppm) @ ftbls

ppm - PARTS PER MILLION
ftbls - FEET BELOW LAND SURFACE

SOIL EXCAVATION AREA (2008) 450 sq-ft TO 13 ft-bls

MW-10 — ABANDONED MONITORING WELL LOCATION AND DESIGNATION

MW-11D — ABANDONED DEEP ZONE MONITORING WELL LOCATION AND DESIGNATION

AS-1 — AIR SPARGE LOCATION AND DESIGNATION

AS-1 — AIR SPARGE WELL, SCREENED 43-45' AND 2" Ø

SVE-1 — HIGH VACUUM SVE WELL, SCREENED 15-25' AND 4" Ø

OB-1 — OBSERVATION WELL, SCREENED 20-35' AND 2" Ø

N S W E

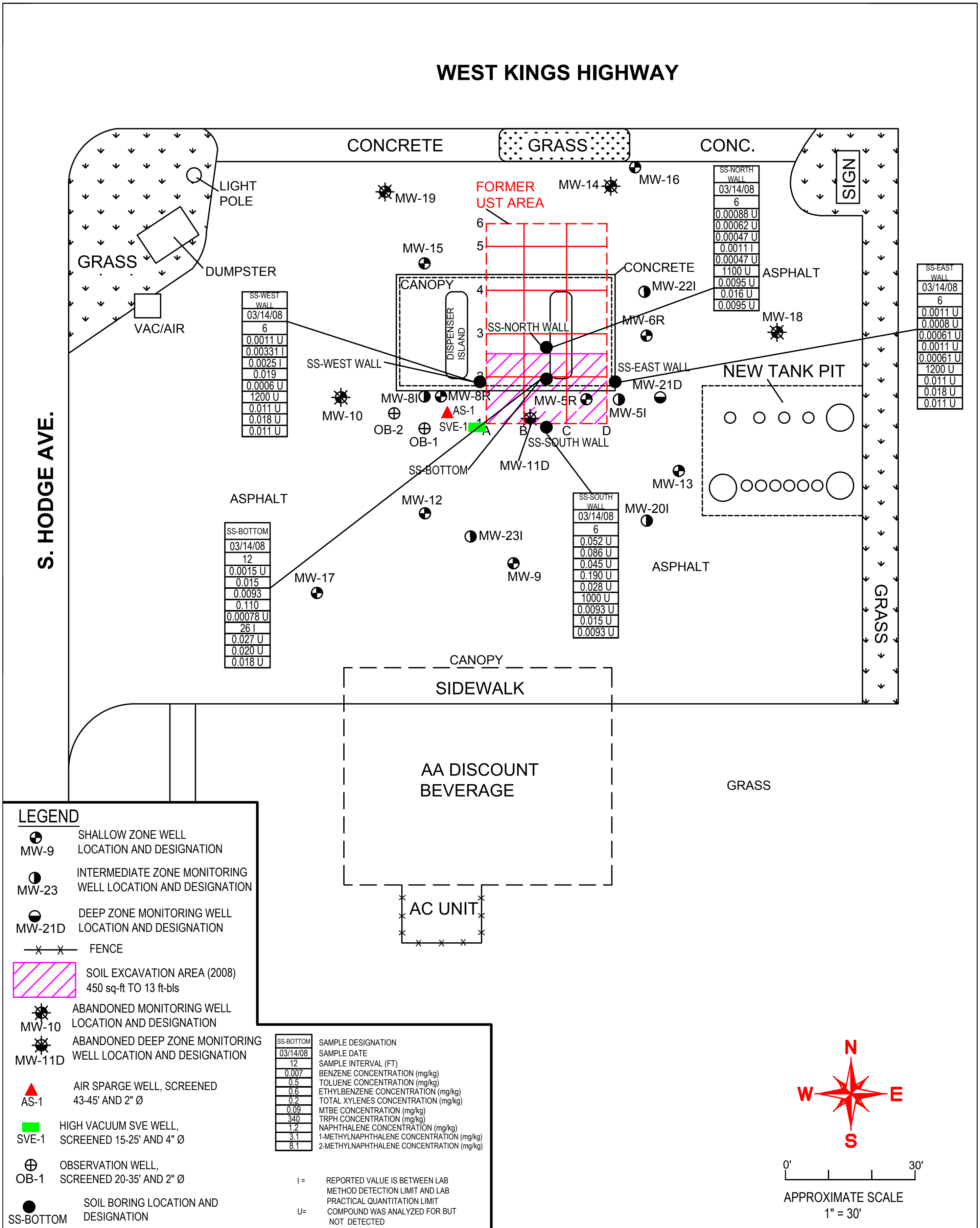
0' 30'
APPROXIMATE SCALE
1" = 30'

MAS ENVIRONMENTAL, LLC

AA DISCOUNT
181 WEST KINGS HWY.
CENTER HILL, SUMTER COUNTY, FLORIDA
FDEP FAC. ID. NO.: 60/8516863

SOIL OVA SUMMARY MAP (02/8-9/18)

FIGURE 2
PROJECT No. M50033.06

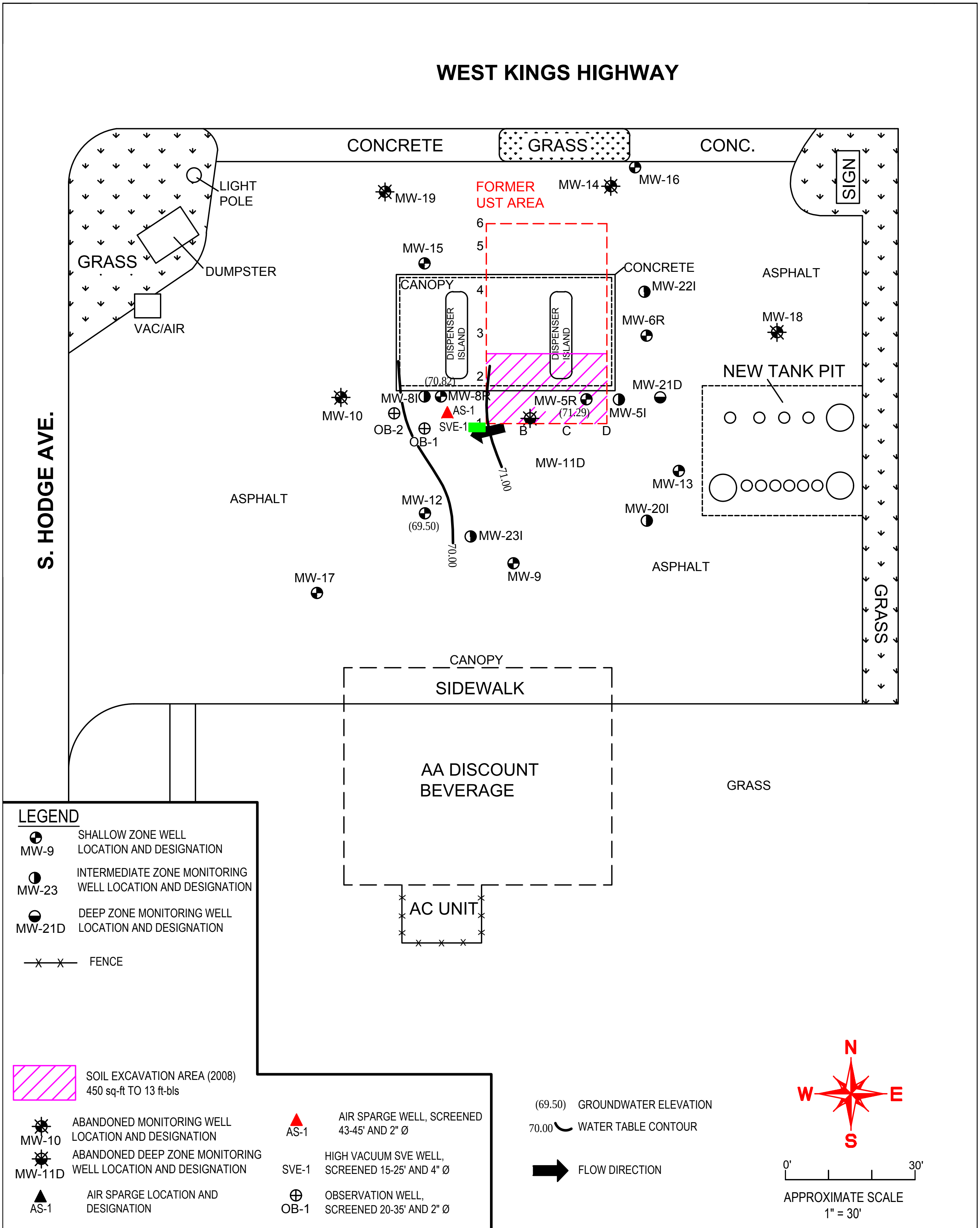


MAS ENVIRONMENTAL, LLC

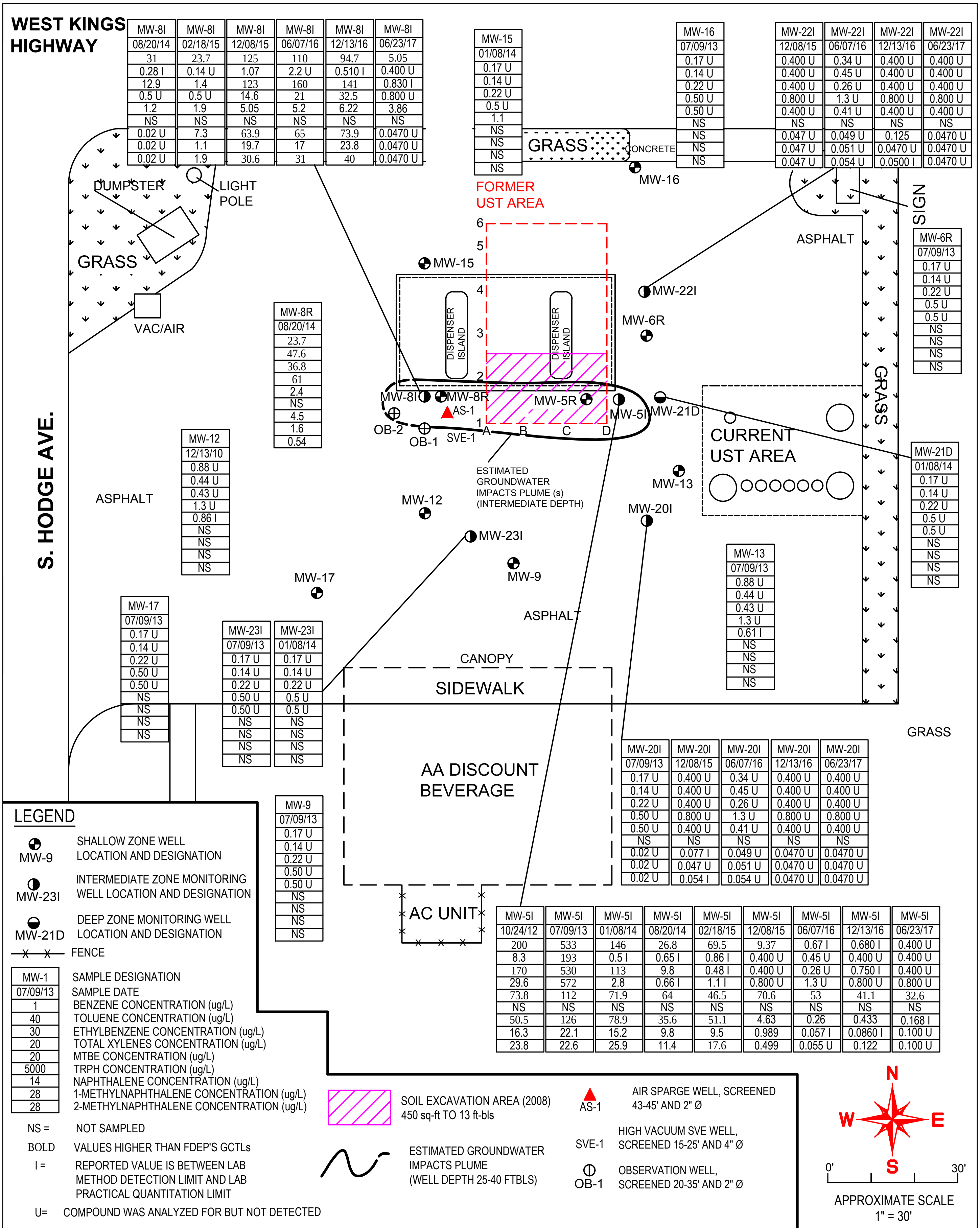
AA DISCOUNT
181 WEST KINGS HWY.
CENTER HILL, SUMTER COUNTY, FLORIDA
FDEP FAC. ID. NO.: 60/8516863

SOIL ANALYTICAL SUMMARY MAP (03/14/08)

FIGURE 3
PROJECT No. M50033.06



MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	GROUNDWATER ELEVATION CONTOUR MAP (02/14/18)	FIGURE 4 PROJECT No. M50033.06



MW-8I	MW-8I	MW-8I	MW-8I	MW-8I	MW-8I
08/20/14	02/18/15	12/08/15	06/07/16	12/13/16	06/23/17
31	23.7	125	110	94.7	5.05
0.28 I	0.14 U	1.07	2.2 U	0.510 I	0.400 U
12.9	1.4	123	160	141	0.830 I
0.5 U	0.5 U	14.6	21	32.5	0.800 U
1.2	1.9	5.05	5.2	6.22	3.86
NS	NS	NS	NS	NS	NS
0.02 U	7.3	63.9	65	73.9	0.0470 U
0.02 U	1.1	19.7	17	23.8	0.0470 U
0.02 U	1.9	30.6	31	40	0.0470 U

MW-15
01/08/14
0.17 U
0.14 U
0.22 U
0.5 U
1.1
NS
NS
NS
NS

MW-16
07/09/13
0.17 U
0.14 U
0.22 U
0.50 U
0.50 U
NS
NS
NS
NS

MW-22I	MW-22I	MW-22I	MW-22I
12/08/15	06/07/16	12/13/16	06/23/17
0.400 U	0.34 U	0.400 U	0.400 U
0.400 U	0.45 U	0.400 U	0.400 U
0.400 U	0.26 U	0.400 U	0.400 U
0.800 U	1.3 U	0.800 U	0.800 U
0.400 U	0.41 U	0.400 U	0.400 U
NS	NS	NS	NS
0.047 U	0.049 U	0.125	0.0470 U
0.047 U	0.051 U	0.0470 U	0.0470 U
0.047 U	0.054 U	0.0500 I	0.0470 U

MW-6R
07/09/13
0.17 U
0.14 U
0.22 U
0.5 U
0.5 U
NS
NS
NS
NS

MW-8R
08/20/14
23.7
47.6
36.8
61
2.4
NS
4.5
1.6
0.54

MW-12
12/13/10
0.88 U
0.44 U
0.43 U
1.3 U
0.86 I
NS
NS
NS
NS

MW-21D
01/08/14
0.17 U
0.14 U
0.22 U
0.5 U
0.5 U
NS
NS
NS
NS

MW-13
07/09/13
0.88 U
0.44 U
0.43 U
1.3 U
0.61 I
NS
NS
NS
NS

MW-17
07/09/13
0.17 U
0.14 U
0.22 U
0.50 U
0.50 U
NS
NS
NS
NS

MW-23I	MW-23I
07/09/13	01/08/14
0.17 U	0.17 U
0.14 U	0.14 U
0.22 U	0.22 U
0.50 U	0.5 U
0.50 U	0.5 U
NS	NS
NS	NS
NS	NS
NS	NS

MW-9
07/09/13
0.17 U
0.14 U
0.22 U
0.50 U
0.50 U
NS
NS
NS
NS

MW-20I	MW-20I	MW-20I	MW-20I	MW-20I
07/09/13	12/08/15	06/07/16	12/13/16	06/23/17
0.17 U	0.400 U	0.34 U	0.400 U	0.400 U
0.14 U	0.400 U	0.45 U	0.400 U	0.400 U
0.22 U	0.400 U	0.26 U	0.400 U	0.400 U
0.50 U	0.800 U	1.3 U	0.800 U	0.800 U
0.50 U	0.400 U	0.41 U	0.400 U	0.400 U
NS	NS	NS	NS	NS
0.02 U	0.077 I	0.049 U	0.0470 U	0.0470 U
0.02 U	0.047 U	0.051 U	0.0470 U	0.0470 U
0.02 U	0.054 I	0.054 U	0.0470 U	0.0470 U

MW-5I	MW-5I	MW-5I	MW-5I	MW-5I	MW-5I	MW-5I	MW-5I	MW-5I
10/24/12	07/09/13	01/08/14	08/20/14	02/18/15	12/08/15	06/07/16	12/13/16	06/23/17
200	533	146	26.8	69.5	9.37	0.67 I	0.680 I	0.400 U
8.3	193	0.51 I	0.65 I	0.86 I	0.400 U	0.45 U	0.400 U	0.400 U
170	530	113	9.8	0.48 I	0.400 U	0.26 U	0.750 I	0.400 U
29.6	572	2.8	0.66 I	1.1 I	0.800 U	1.3 U	0.800 U	0.800 U
73.8	112	71.9	64	46.5	70.6	53	41.1	32.6
NS	NS	NS	NS	NS	NS	NS	NS	NS
50.5	126	78.9	35.6	51.1	4.63	0.26	0.433	0.168 I
16.3	22.1	15.2	9.8	9.5	0.989	0.057 I	0.0860 I	0.100 U
23.8	22.6	25.9	11.4	17.6	0.499	0.055 U	0.122	0.100 U

LEGEND

MW-9 — SHALLOW ZONE WELL LOCATION AND DESIGNATION

MW-23I — INTERMEDIATE ZONE MONITORING WELL LOCATION AND DESIGNATION

MW-21D — DEEP ZONE MONITORING WELL LOCATION AND DESIGNATION

FENCE

MW-1	SAMPLE DESIGNATION
07/09/13	SAMPLE DATE
1	BENZENE CONCENTRATION (ug/L)
40	TOLUENE CONCENTRATION (ug/L)
30	ETHYLBENZENE CONCENTRATION (ug/L)
20	TOTAL XYLENES CONCENTRATION (ug/L)
20	MTBE CONCENTRATION (ug/L)
5000	TRPH CONCENTRATION (ug/L)
14	NAPHTHALENE CONCENTRATION (ug/L)
28	1-METHYLNAPHTHALENE CONCENTRATION (ug/L)
28	2-METHYLNAPHTHALENE CONCENTRATION (ug/L)

NS = NOT SAMPLED

BOLD VALUES HIGHER THAN FDEP'S GCTLs

I = REPORTED VALUE IS BETWEEN LAB METHOD DETECTION LIMIT AND LAB PRACTICAL QUANTITATION LIMIT

U= COMPOUND WAS ANALYZED FOR BUT NOT DETECTED

SOIL EXCAVATION AREA (2008) 450 sq-ft TO 13 ft-bls

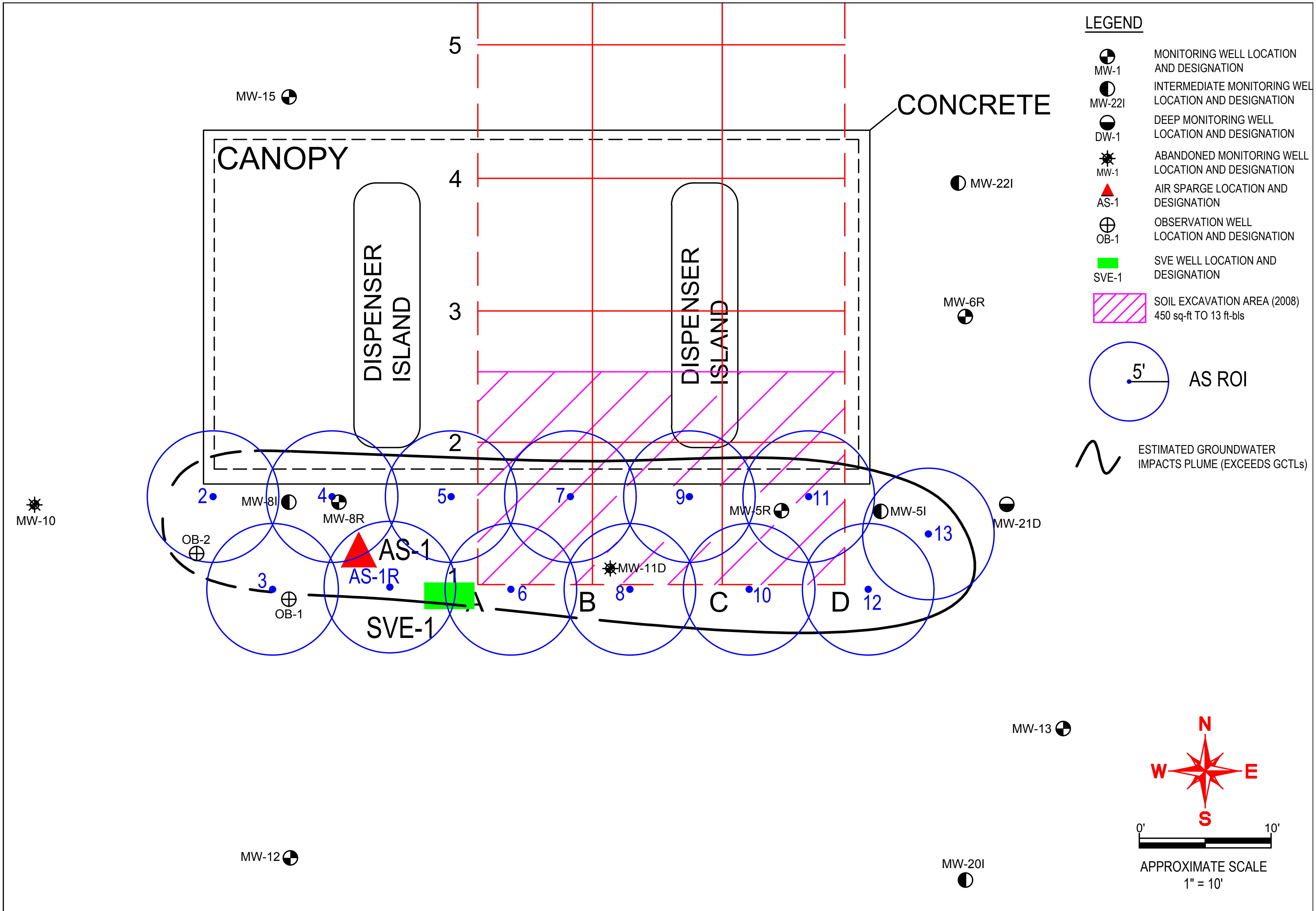
ESTIMATED GROUNDWATER IMPACTS PLUME (WELL DEPTH 25-40 FTBLS)

AS-1 — AIR SPARGE WELL, SCREENED 43-45' AND 2" Ø

SVE-1 — HIGH VACUUM SVE WELL, SCREENED 15-25' AND 4" Ø

OB-1 — OBSERVATION WELL, SCREENED 20-35' AND 2" Ø

MAS ENVIRONMENTAL, LLC	AA DSICOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	GROUNDWATER ANALYTICAL SUMMARY-INTERMEDIATE & DEEP ZONE (10/24/12, 03/26/13, 07/09/13, 01/08/14, 08/20/14, 02/18/15, 12/08/15, 06/07/16,12/13/16, & 06/23/17)	FIGURE 5 PROJECT No. M50033.06

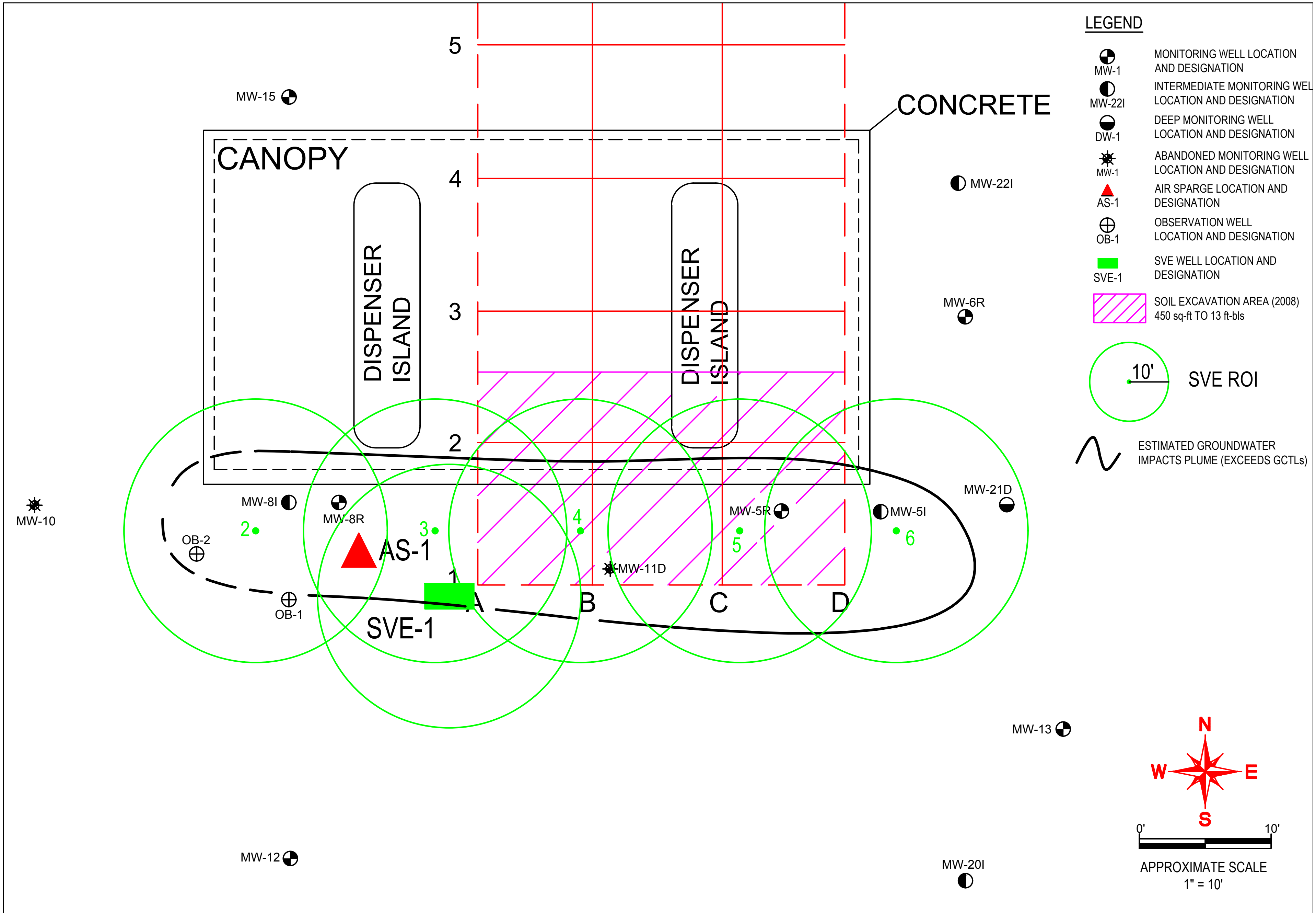


MAS ENVIRONMENTAL, LLC

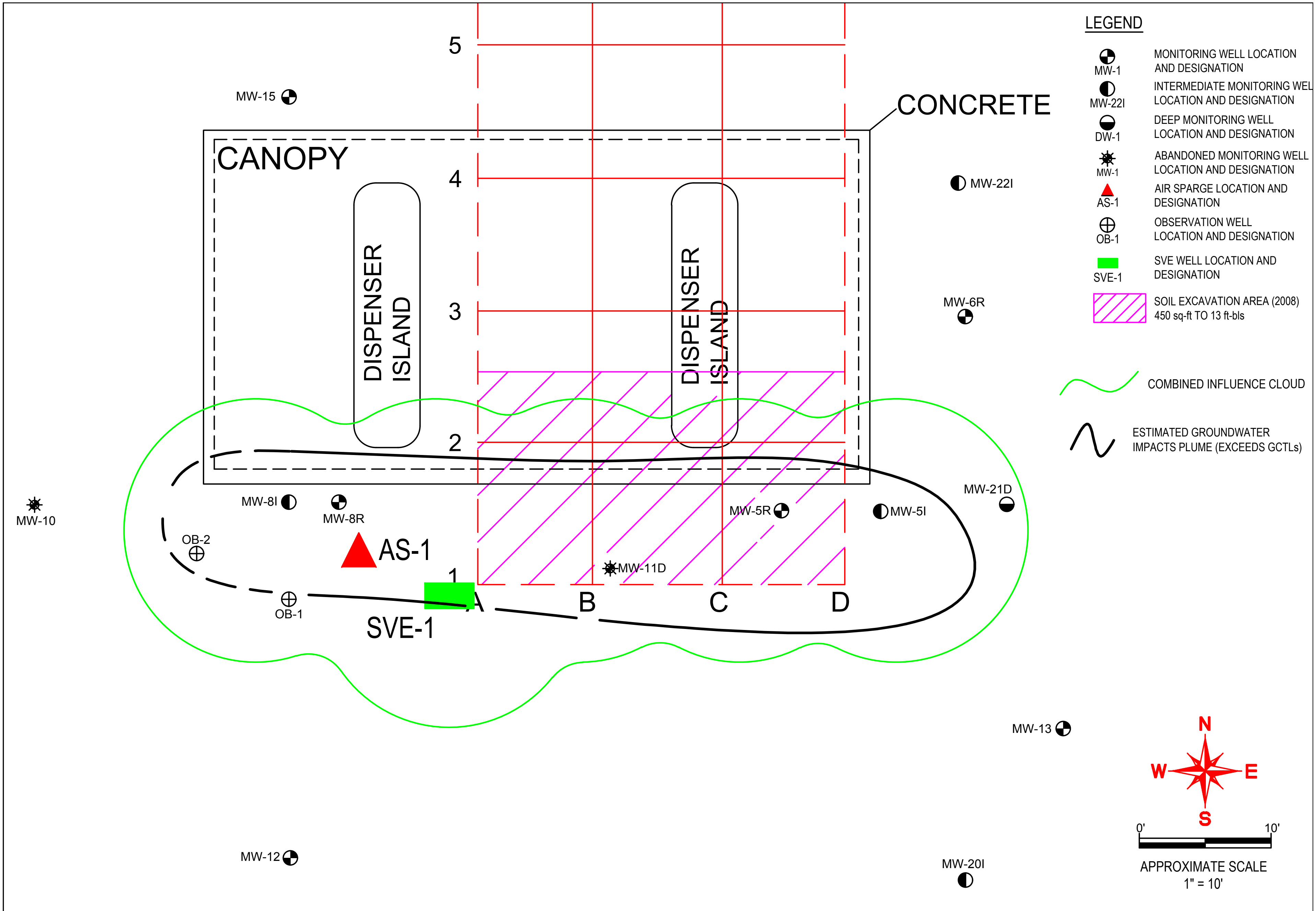
AA DISCOUNT
181 WEST KINGS HWY.
CENTER HILL, SUMTER COUNTY, FLORIDA
FDEP FAC. ID. NO.: 60/8516863

AIR SPARGE RADIUS OF INFLUENCE MAP

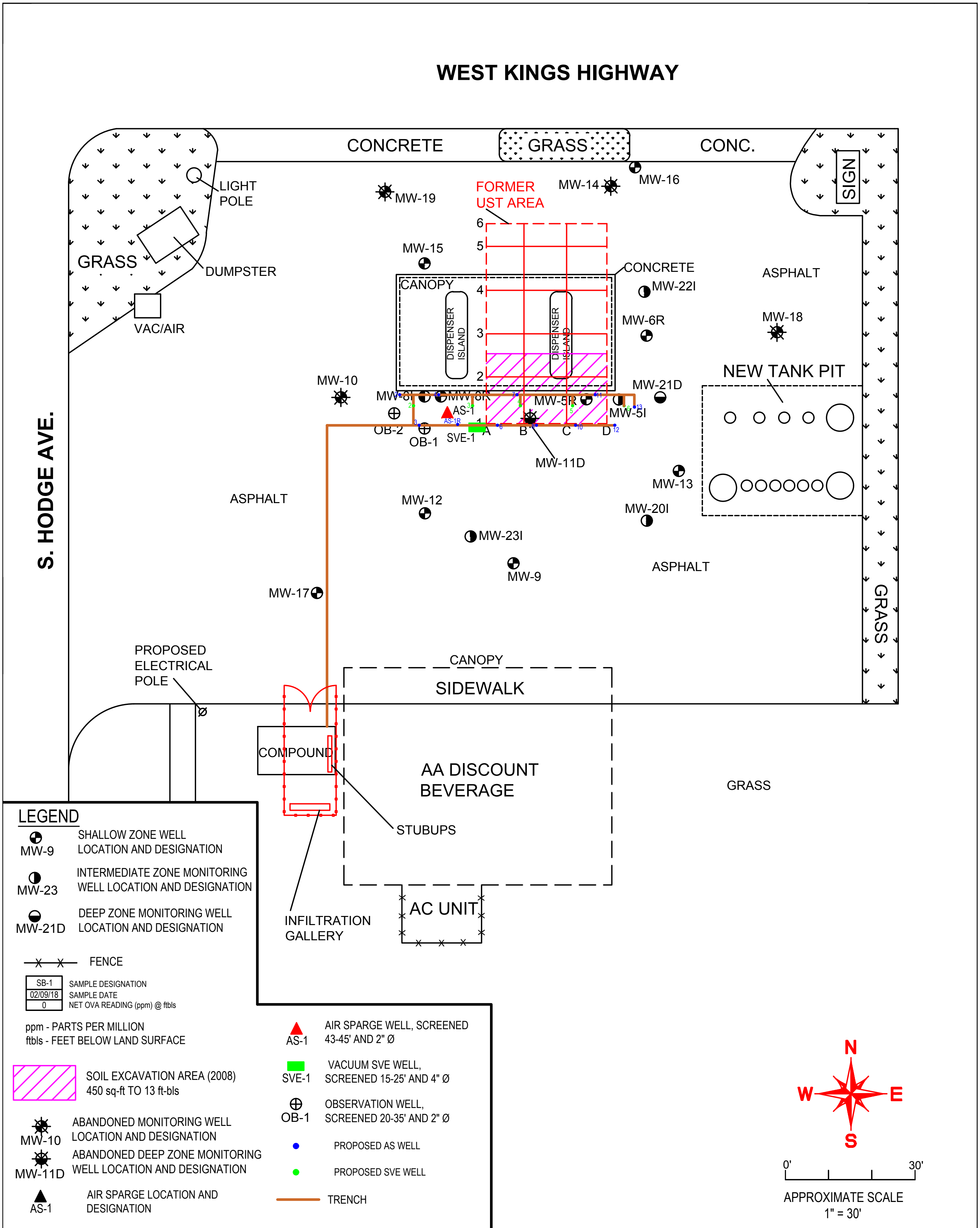
FIGURE
6
PROJECT No.
M50033.06



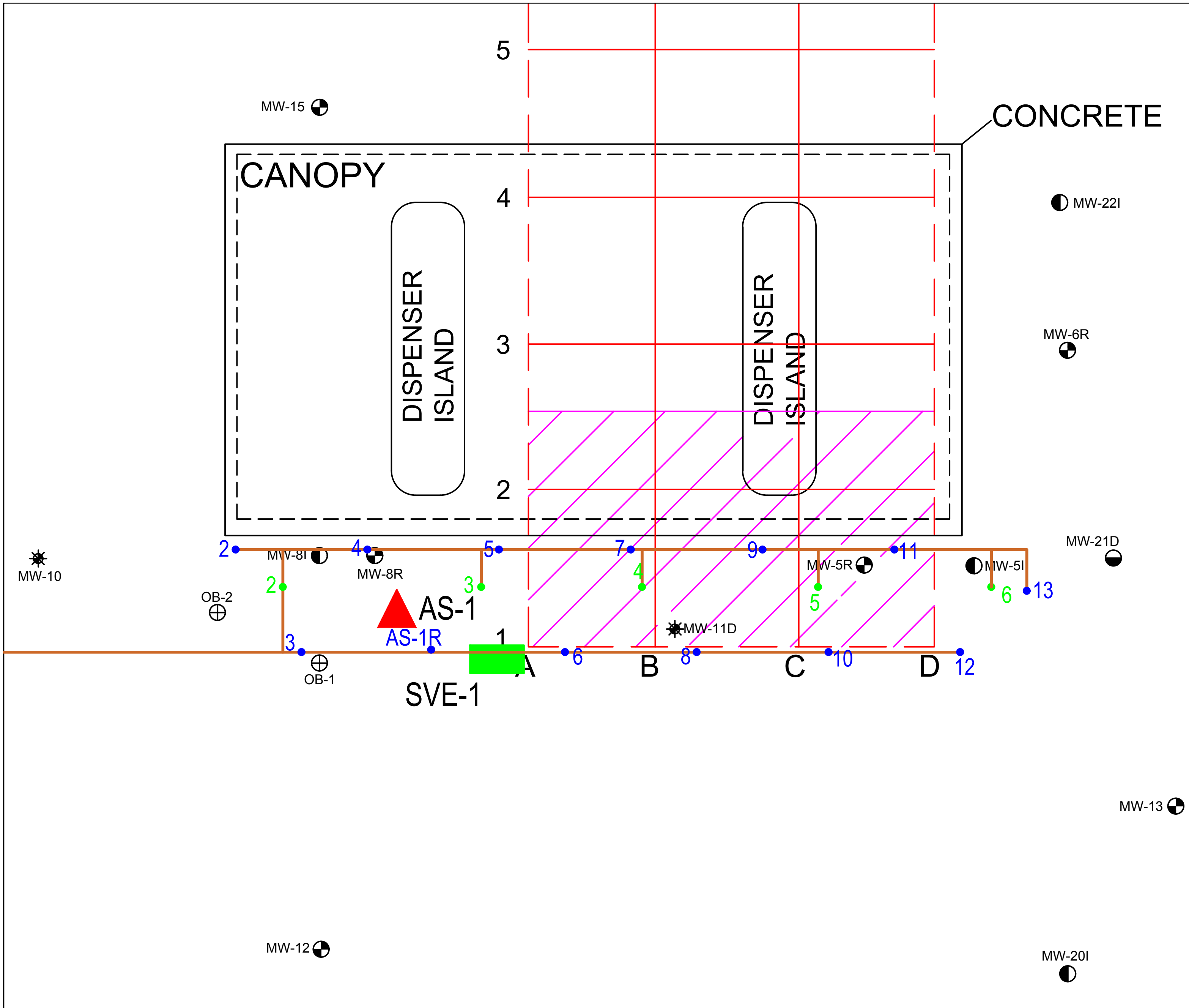
MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	SVE SPARGE RADIUS OF INFLUENCE MAP	FIGURE 7 PROJECT No. M50033.06



MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	COMBINED AS AND SVE RADIUS OF INFLUENCE MAP	FIGURE 8 PROJECT No. M50033.06



MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	PROPOSED REMEDIAL SYSTEM LAYOUT MAP	FIGURE 9A PROJECT No. M50033.06



LEGEND

MW-1	MONITORING WELL LOCATION AND DESIGNATION
MW-22I	INTERMEDIATE MONITORING WELL LOCATION AND DESIGNATION
DW-1	DEEP MONITORING WELL LOCATION AND DESIGNATION
MW-1	ABANDONED MONITORING WELL LOCATION AND DESIGNATION
AS-1	AIR SPARGE LOCATION AND DESIGNATION
OB-1	OBSERVATION WELL LOCATION AND DESIGNATION
SVE-1	SVE WELL LOCATION AND DESIGNATION
	SOIL EXCAVATION AREA (2008) 450 sq-ft TO 13 ft-bls
	TRENCH
	PROPOSED AS WELL
	PROPOSED SVE WELL

N E S W

0' 10'

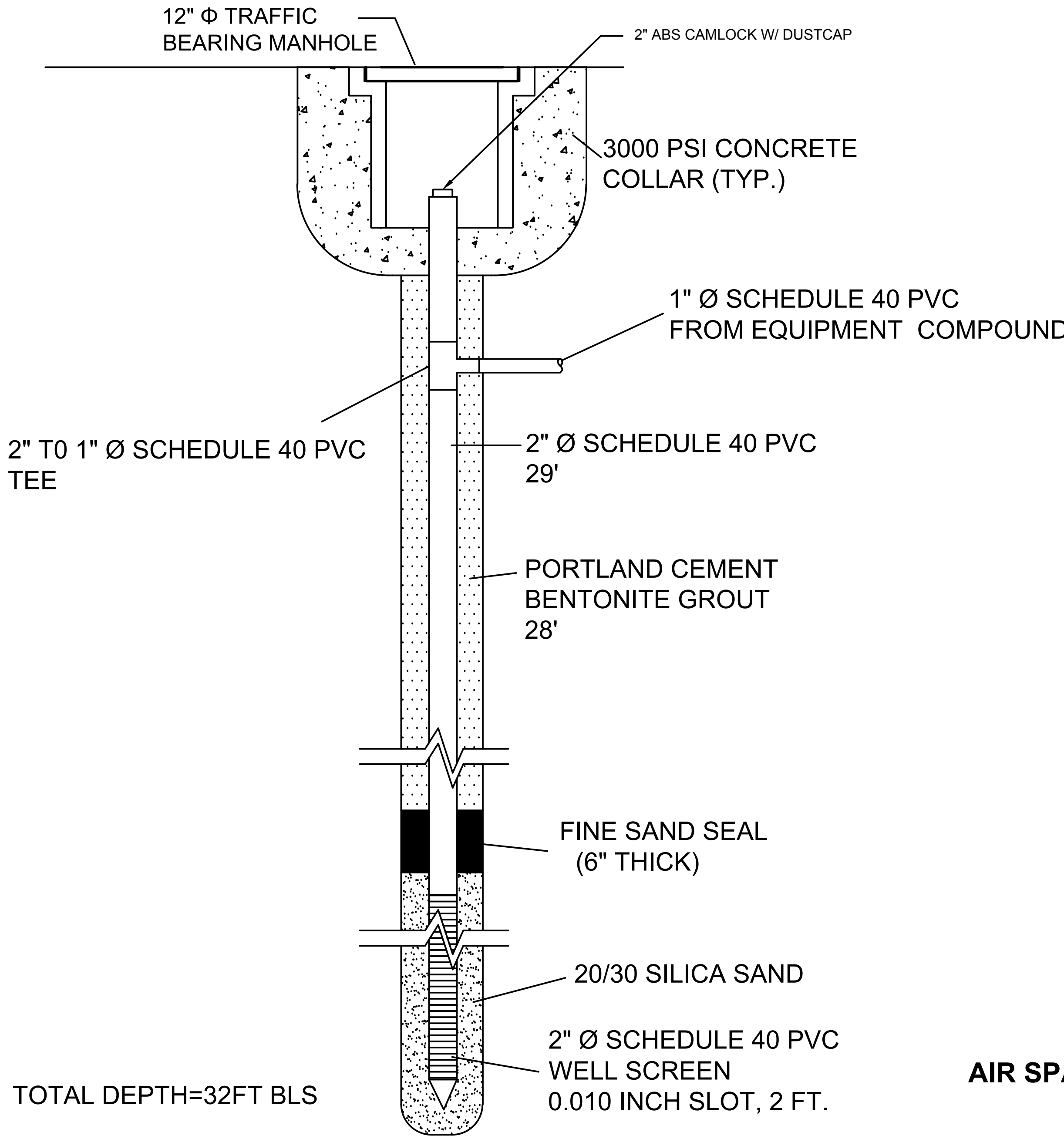
APPROXIMATE SCALE
1" = 10'

MAS ENVIRONMENTAL, LLC

AA DISCOUNT
181 WEST KINGS HWY.
CENTER HILL, SUMTER COUNTY, FLORIDA
FDEP FAC. ID. NO.: 60/8516863

PROPOSED TRENCHING LAYOUT MAP

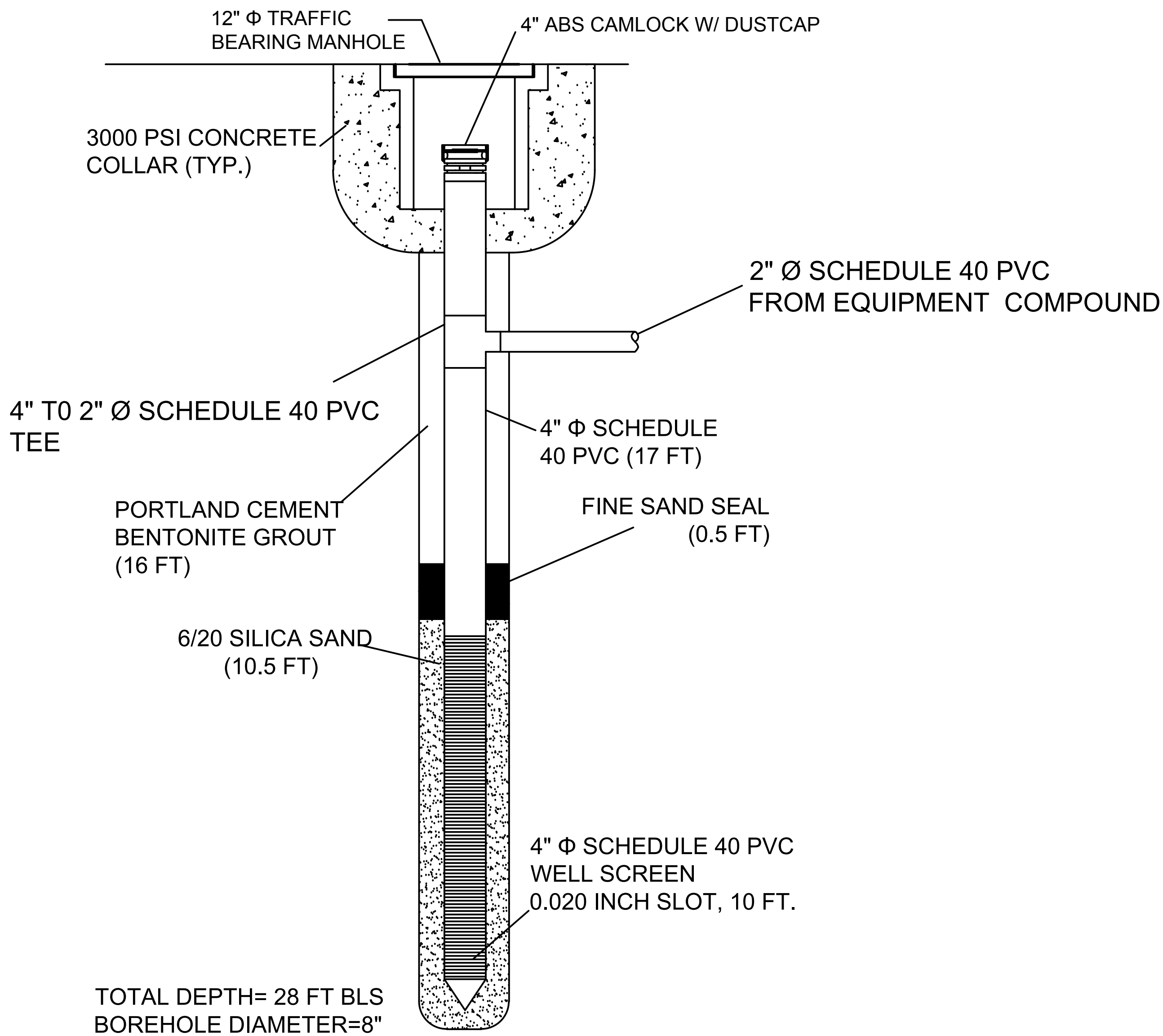
FIGURE
9B
PROJECT No.
M50033.06



AIR SPARGE WELL DETAIL

NOT TO SCALE

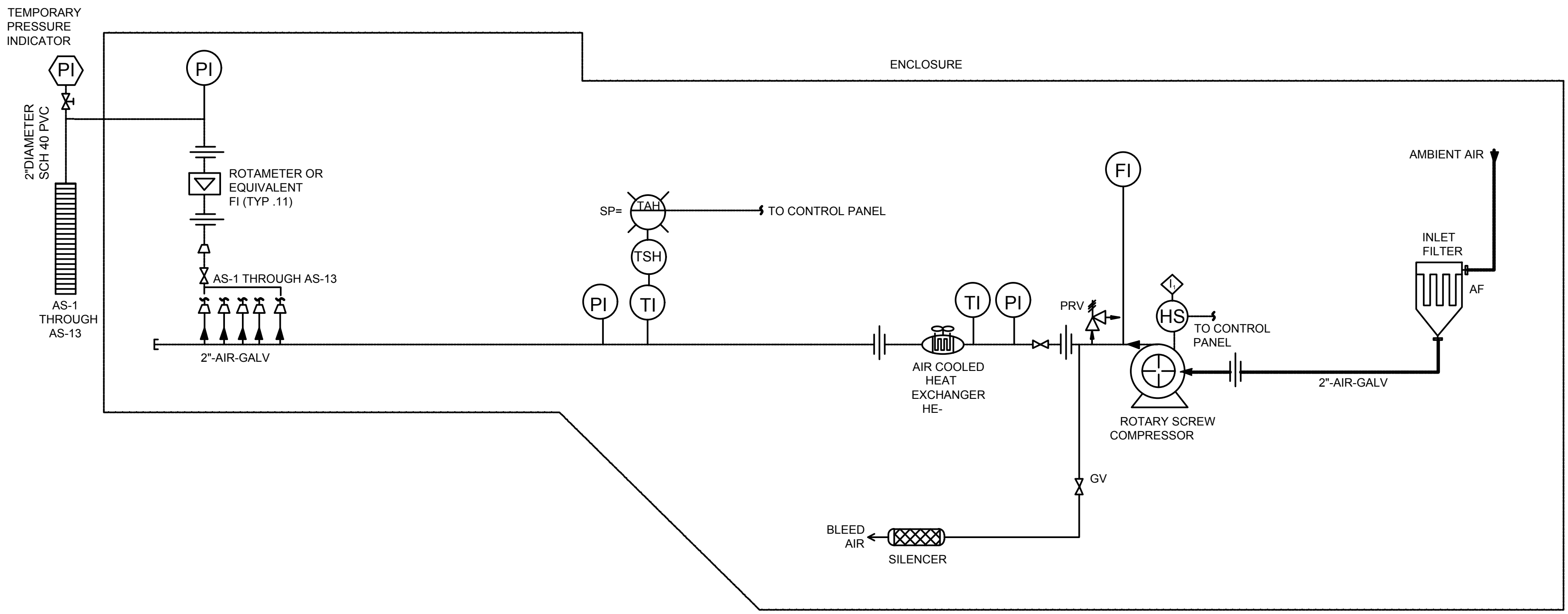
MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	AS WELL DETAIL	FIGURE 10 PROJECT No. M50033.06



SOIL VAPOR EXTRACTION WELL DETAIL

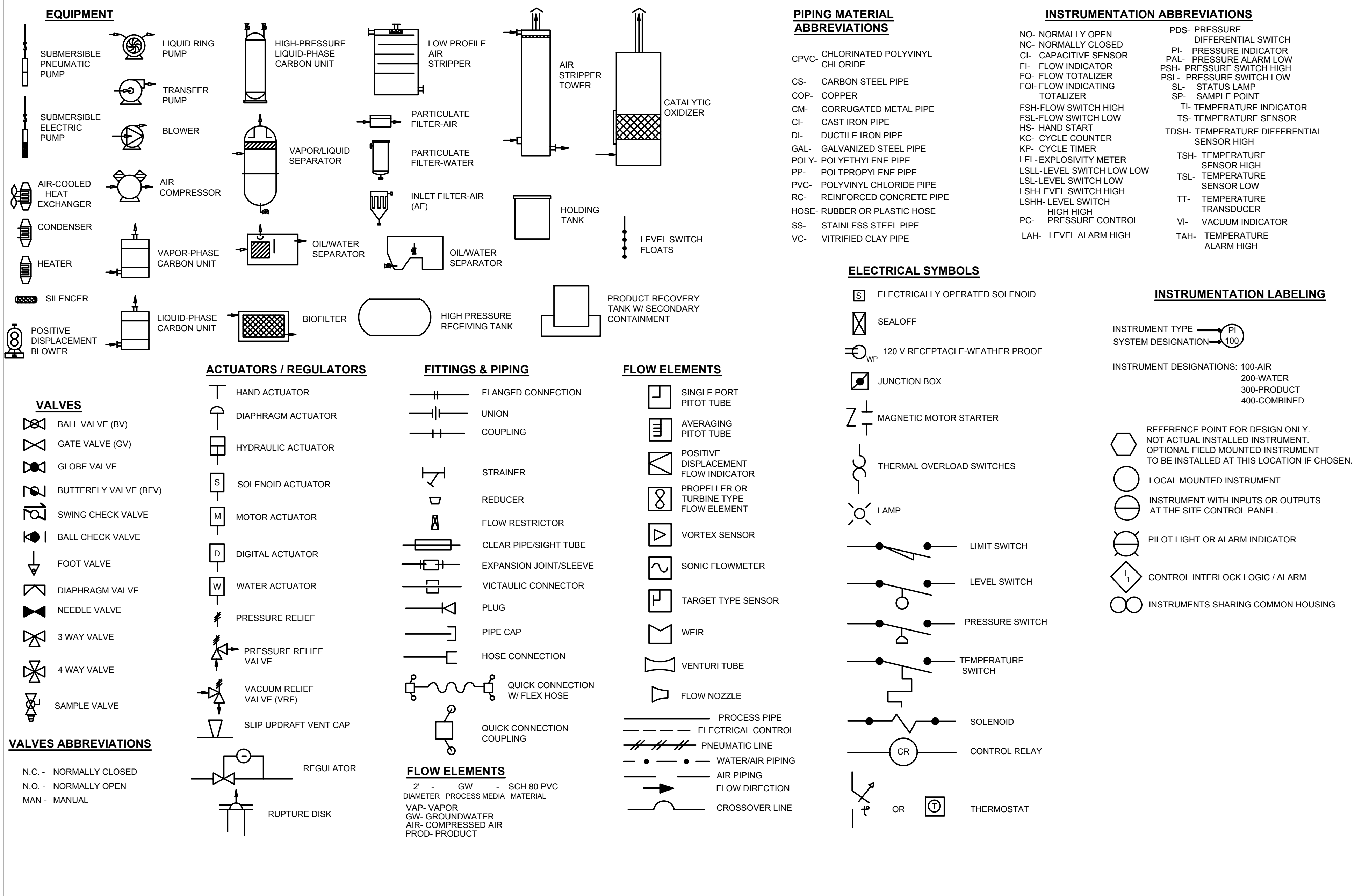
NOT TO SCALE

MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	SOIL VAPOR EXTRACTION WELL DETAIL	FIGURE 11 PROJECT No. M50033.06



NOT TO SCALE

MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	AIR SPARGE PROCESS AND INSTRUMENTATION DIAGRAM	FIGURE 12 PROJECT No. M50033.06



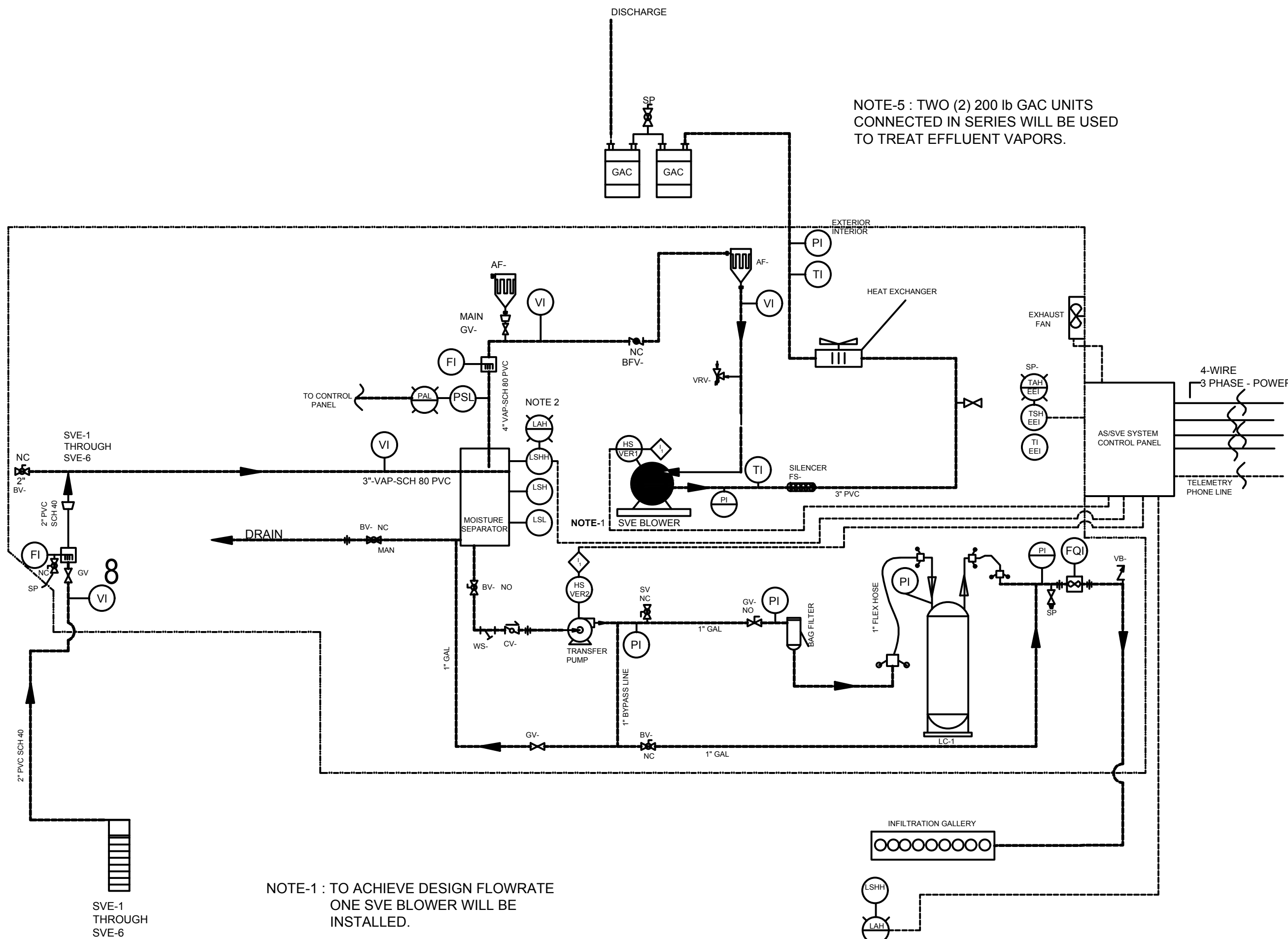
MAS ENVIRONMENTAL, LLC

AA DISCOUNT
181 WEST KINGS HWY.
CENTER HILL, SUMTER COUNTY, FLORIDA
FDEP FAC. ID. NO.: 60/8516863

PROCESS AND INSTRUMENTATION DIAGRAMS LEGEND

FIGURE
13
PROJECT No.
M50033.06

NOTE-5 : TWO (2) 200 lb GAC UNITS CONNECTED IN SERIES WILL BE USED TO TREAT EFFLUENT VAPORS.



NOTE-1 : TO ACHIEVE DESIGN FLOWRATE ONE SVE BLOWER WILL BE INSTALLED.

NOTE-2 : IF LSH (MOISTURE SEPARATOR) IS ACTIVATED, TRANSFER PUMP WILL ACTIVATE

NOTE-3 : IF LSHH (MOISTURE SEPARATOR) IS ACTIVATED,SVE BLOWER MOTOR WILL SHUT DOWN. IF SVE BL0WER MOTOR IS SHUT DOWN, AS COMPRESSION IS SHUT DOWN. (BOTH NON-LATCHING)

NOTE-4 : IF LSHH (INFILTRATION GALLYERY) TRANSFER PUMP MOTOR IS SHUT DOWN (NON-LATCHING).

NOTE-5 : EACH SVE WELL WILL BE EQUIPED WITH FLOW & VACUUM GAUGE AT MANIFOLD

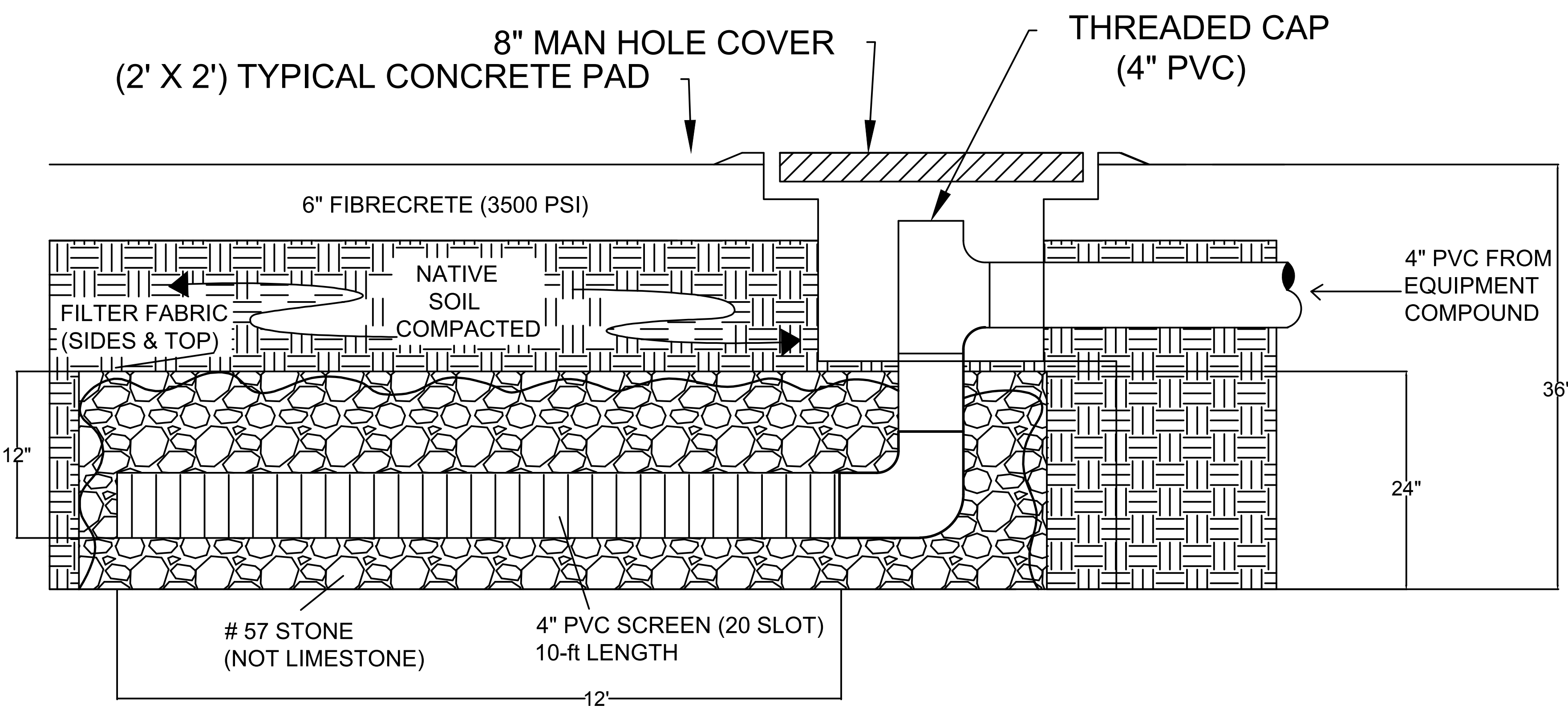
NOT TO SCALE

MAS ENVIRONMENTAL, LLC

AA DISCOUNT
181 WEST KINGS HWY.
CENTER HILL, SUMTER COUNTY, FLORIDA
FDEP FAC. ID. NO.: 60/8516863

SOIL VAPOR EXTRACTION PROCESS AND INSTRUMENTATION DIAGRAM

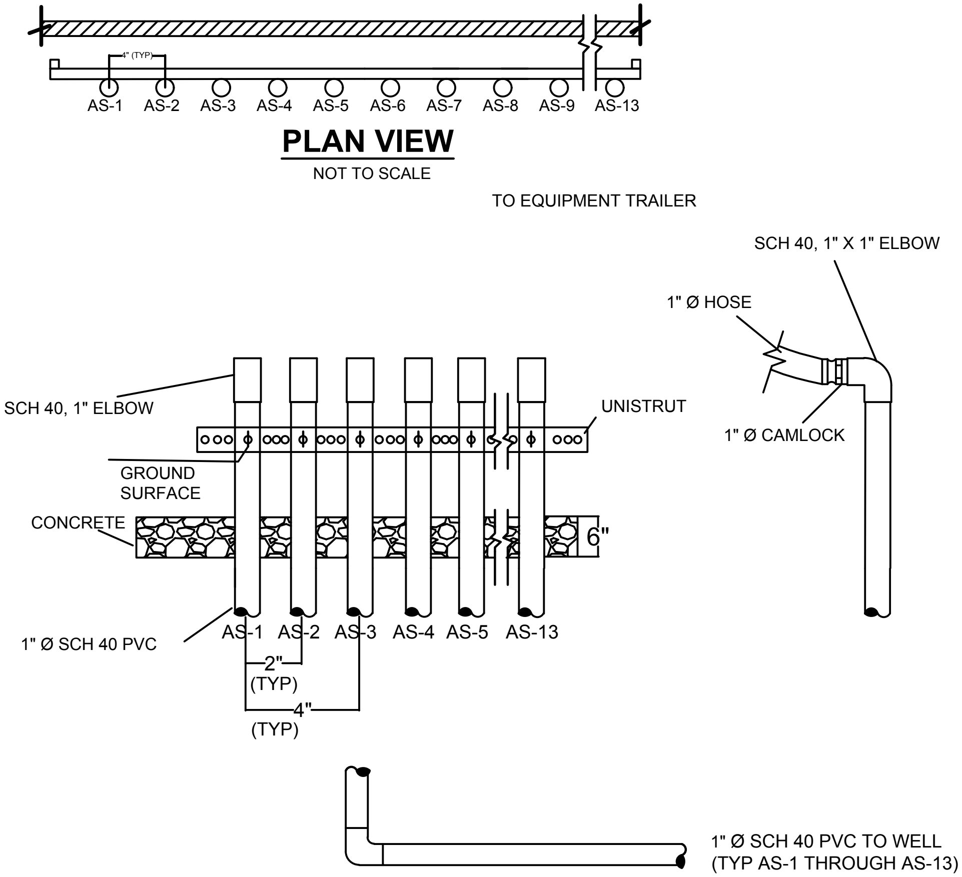
FIGURE
14
PROJECT No.
M50033.06



NOTE: GALLERY TO BE 48" WIDE WITH
4" PVC SCREEN AT CENTER.

NOT TO SCALE

MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	INFILTRATION GALLERY DETAIL	FIGURE 15 PROJECT No. M50033.06

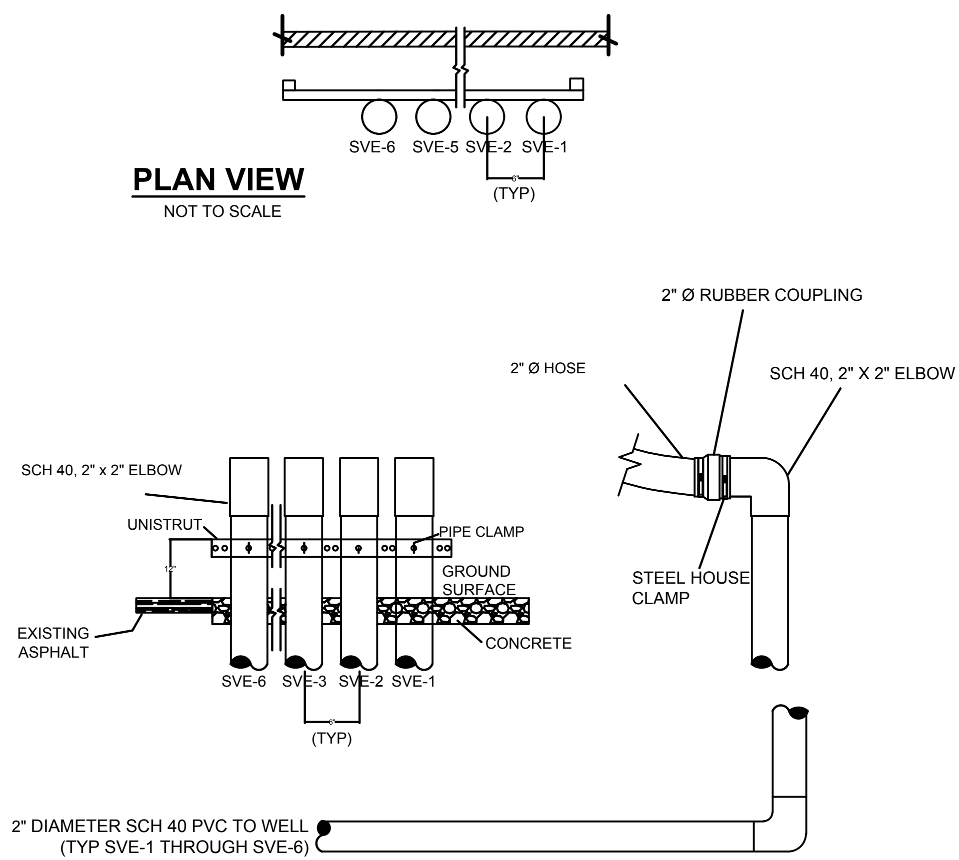


ELEVATION VIEW AS-1 THROUGH AS-13

NOT TO SCALE

AIR SPARGE STUB-UP DETAILS

NOT TO SCALE



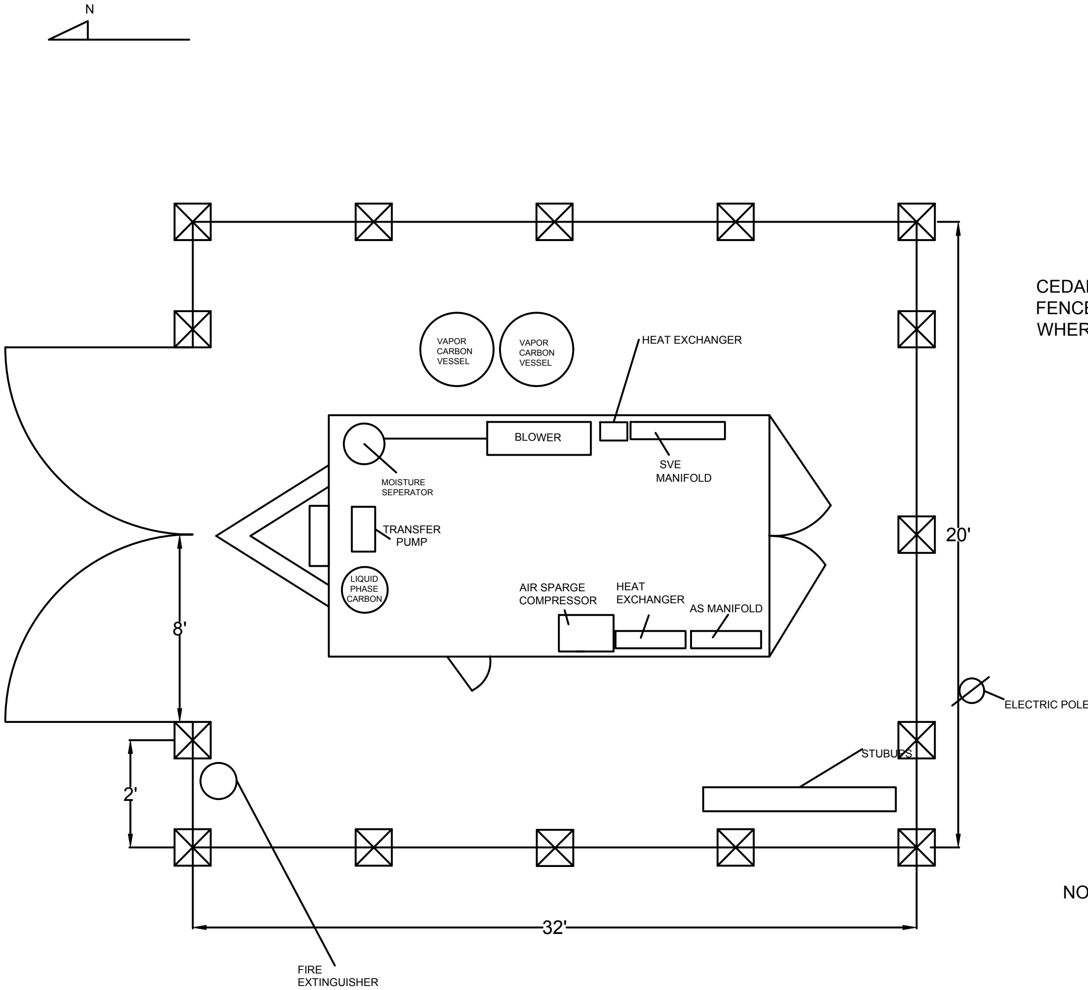
ELEVATION VIEW SVE-1 THROUGH SVE-6

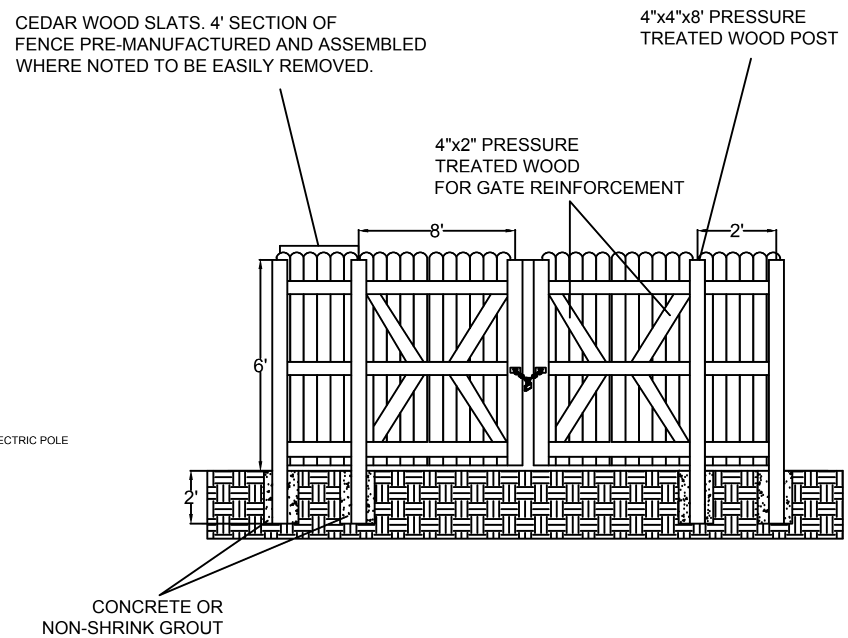
NOT TO SCALE

SOIL VAPOR STUB-UP DETAILS

NOT TO SCALE

MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	STUB-UP DETAILS	FIGURE 16 PROJECT No. M50033.06





FENCE DETAIL

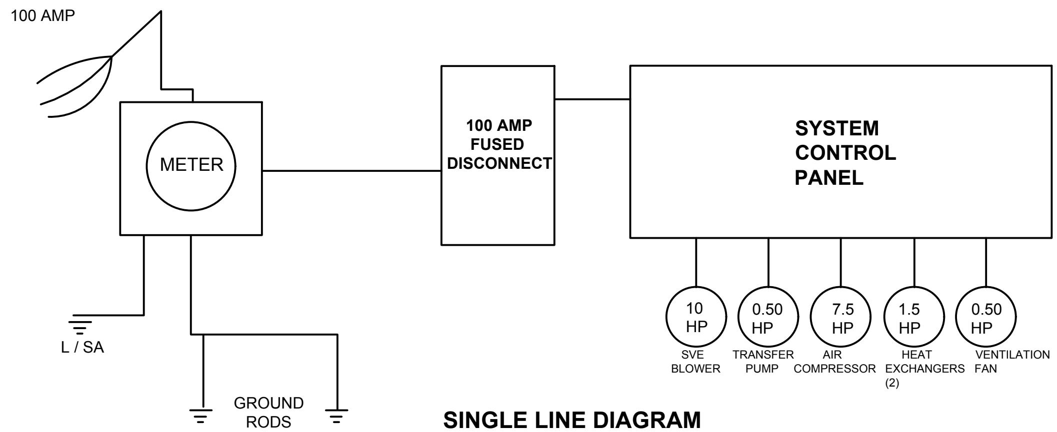
VIEW FROM INSIDE OF COMPOUND

(NOT TO SCALE)

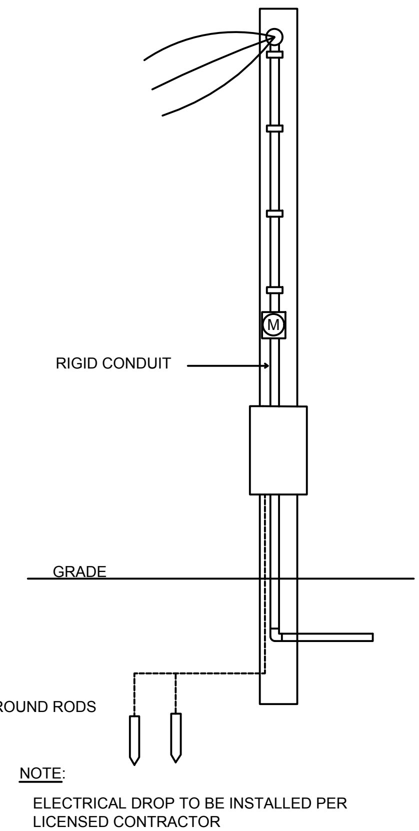
SIGNS TO BE PLACED:

- -DANGER HIGH VOLTAGE
- -NO SMOKING
- -EMERGENCY CONTACT
- -FIRE EXTINGUISHER

MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	EQUIPMENT COMPOUND LAYOUT AND FENCE DETAIL	FIGURE 17 PROJECT No. M50033.06

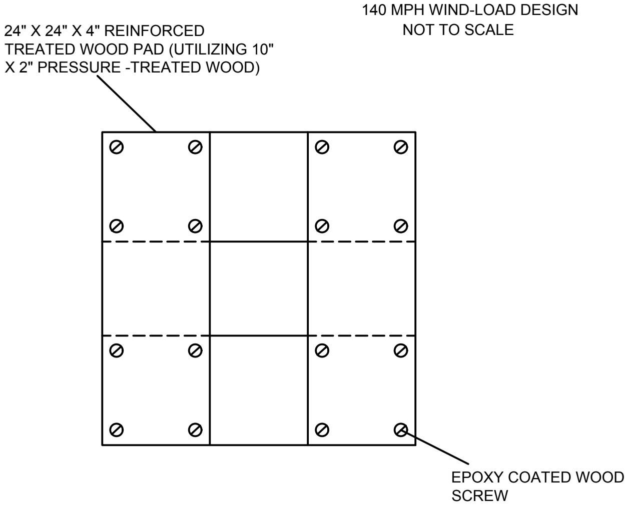


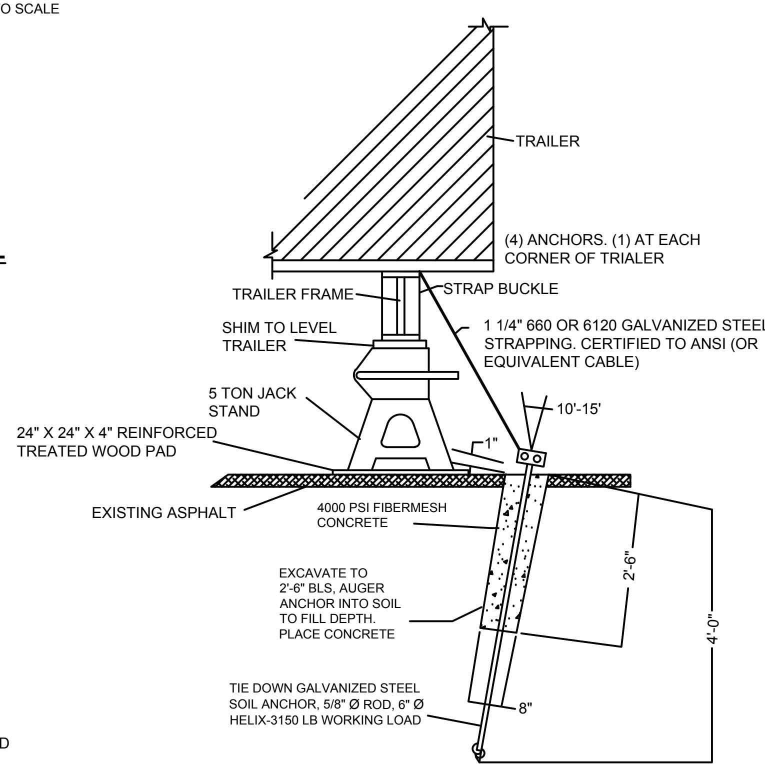
SINGLE LINE DIAGRAM
NOT TO SCALE



SINGLE DROP DETAILS
NOT TO SCALE

TRAILER TIE DOWN DETAIL
140 MPH WIND-LOAD DESIGN
NOT TO SCALE





MAS ENVIRONMENTAL, LLC	AA DISCOUNT 181 WEST KINGS HWY. CENTER HILL, SUMTER COUNTY, FLORIDA FDEP FAC. ID. NO.: 60/8516863	ELECTRICAL DROP DETAIL AND TIE DOWN DETAIL	FIGURE 18 PROJECT No. M50033.06

APPENDIX A

RMM

Potable Well Survey

Florida Department of Health Bureau of Environmental Health

Facility ID: **8516863**
Request: 63006
Name: ISLAND FOOD STORE 314
Address: 314 KINGS HWY
CENTER HILL, FL 33514

County:
SUMTER

GPS Date / Method: 8/16/2001 DGPS
Decimal Degrees: 28.649809 -82.00058
Deg Min Sec: 28 38 59.3124 82 0 2.0880

Large (>150,000 gpd) Public Supply Wells within 1/2 mile: 2
Small potable wells within 1/4 mile: 0

Sent to CHD: 5/19/2015
Received: 7/20/2015

FAVA*: (MV: More Vulnerable; V: Vulnerable; LV: Less Vulnerable)
Surficial: MV Intermediate: No Data Floridan: MV

Comment:

APPROVED WaszinkLM

* Florida Aquifer Vulnerability Assessment (FAVA) data obtained from the Florida Department of Environmental Protection. The Florida Department of Health does not guarantee this data to be free from errors or inaccuracies and disclaims any responsibility or liability for interpretations or decisions based thereon.

DEP PWS Wells

	Well Address	Location / GPS Method	Distance from Facility	
AAF4056	CENTER HILL 2	28.64922	217.85 m	714.72 ft
Well Type: COMMUNITY	94 VIRGINIA AVE	-81.998449		
Status: ACTIVE	CENTER HILL, FL 33514	DGPS		
Permit Number: 6600316			Large PWS Well	
Design Capacity: 1000000				

Latest Sample ID (VOC): TLH-2015-07-16-44-01
Sample Date: 7/15/2015 9:45:

BROMODICHLOROMETHANE (THM)	4.8	ug/L
BROMOFORM (THM)	1.1	ug/L
CHLOROFORM (THM)	3.3	ug/L
DIBROMOCHLOROMETHANE (THM)	4.3	ug/L

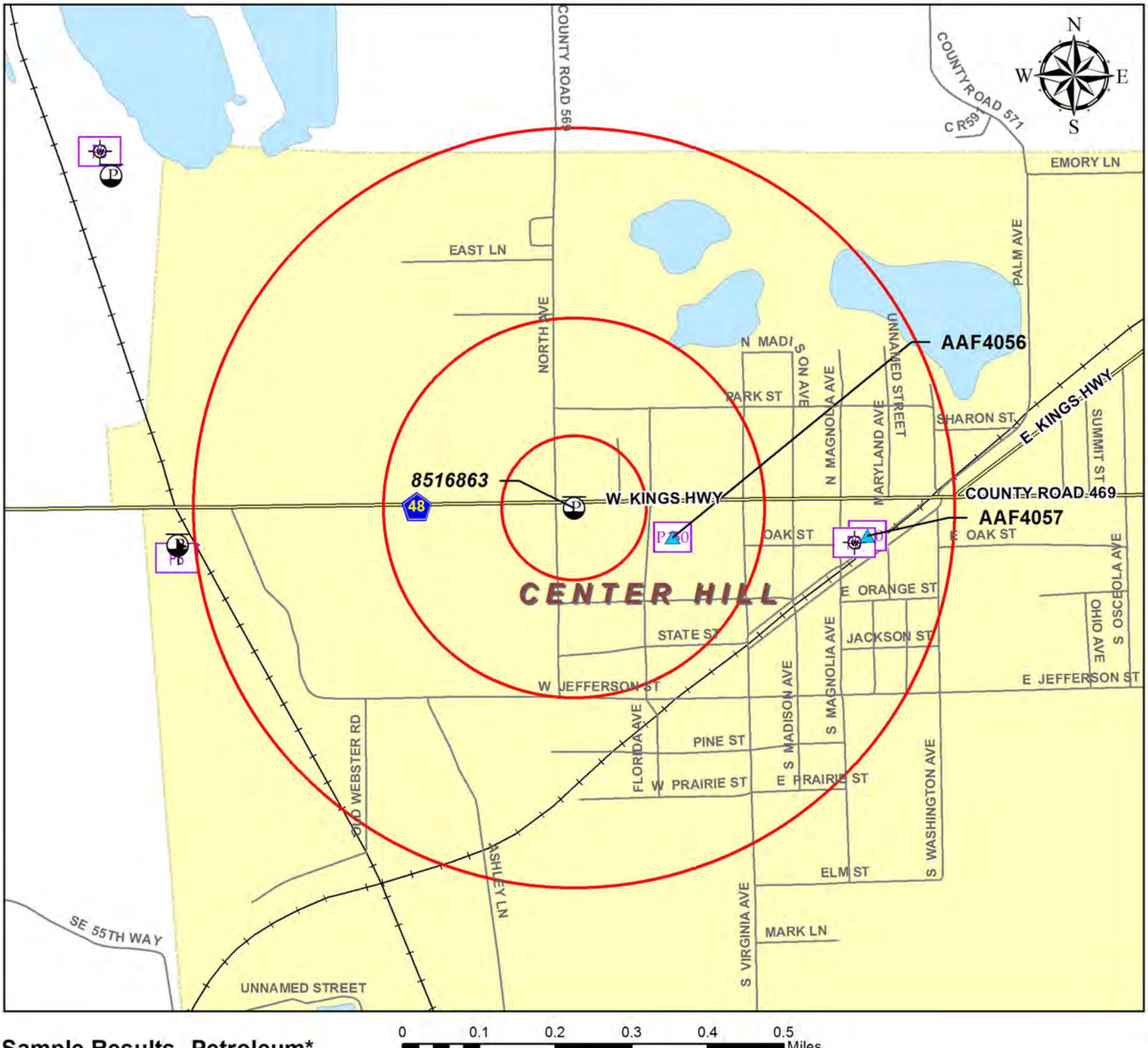
	Well Address	Location / GPS Method	Distance from Facility	
AAF4057	CENTER HILL 1	28.649186	622.98 m	2043.86 ft
Well Type: COMMUNITY	94 VIRGINIA AVE	-81.994231		
Status: ACTIVE	CENTER HILL, FL 33514	DGPS		
Permit Number: 6600316			Large PWS Well	
Design Capacity: 1000000				

Latest Sample ID (VOC): TLH-2015-07-16-44-02
Sample Date: 7/15/2015 10:0

All Results were Below Detection for this Analysis

8516863
ISLAND FOOD STORE 314
314 KINGS HWY
CENTER HILL, FL 33514

Latitude/Longitude: 28.649809 -82.00058
DDMMSS: 28 38 59.3124 82 0 2.088
Number of large public wells (>150,000 gpd) within the 1/2 mile: 2
Number of small public and private wells within the 1/4 mile: 0



Sample Results--Petroleum*

- >1/2 MCL/HAL
- <1/2 MCL/HAL
- <1/4 MCL/HAL
- Sampled, no detect
- Not sampled within last year (3 years if large Community PWS)
- No sample found for this analysis

SDWA PWS Wells

Design Capacity

- PS <150,000 gpd
- P150 ≥150,000 gpd

Facility Type

- Petroleum
- Proximity Threat
- Drycleaner
- Toxics
- Other
- Cattle Dip Vat

Florida HEALTH

Florida Department of Health Bureau of Environmental Health

Disclaimer

This product is for reference purposes only and is not to be construed as a legal document. Any reliance on the information contained herein is at the user's own risk. The Florida Department of Health and it's agents assume no responsibility for any use of the information contained herein or any loss resulting therefrom.

* The following chemicals were use for the Petroleum Indicator analysis: Benzene, Ethylbenzene, Toluene, Xylenes (Total), Napthalene, and Methyl-Tert-Butyl-Ether (MTBE)

08/25/2015
WaszinkLM
SUMTER

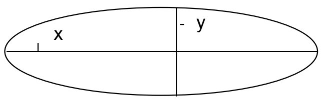
APPENDIX B

Hydrocarbon Mass Estimate - Dissolved Phase

Well ID	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	MTBE	Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	TRPH
MW-5R	**7/20/2016**	0.17	0.14	0.22	0.5	1	1.8	0.02	0.02	0.02	
MW-5I	**7/20/2016**	0.4	0.4	0.4	0.8	2	**32.6**	0.168	0.1	0.1	
MW-8R	**8/20/2017**	**23.7**	**47.6**	**36.8**	**61**	169.1	2.4	4.5	1.6	0.54	
MW-8I	**7/20/2016**	**5.05**	0.4	0.83	0.8	7.08	3.86	0.047	0.047	0.047	
	Average	**7**	**12**	**10**	**16**	**45**	**10**	**1**	**0**	**0**	**#DIV/0!**

All concentrations in ug/l.
Note: One half of the detection limit was used for those analytical results that were below detection limits.
Areal extent of impacted groundwater estimated from RAP figures
** Based on an average thickness of the contaminated water (Depth to Water, ft bls to depth of elevated OVA readings at SB-1) [(19-29) ft bls]

Mass of Individual Contaminants



	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	MTBE	Naph-thalene	1-Methyl-naphthalene	2-Methyl-naphthalene	TRPH	
X*, ft	60	60	60	60	60	60	60	60	60	60	
Y*, ft	15	15	15	15	15	15	15	15	15	15	
Zmax**, ft	10	10	10	10	10	10	10	10	10	10	
porosity	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
VGW***, gal	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	
VGW, L	50028	50028	50028	50028	50028	50028	50028	50028	50028	50028	
Avg Conc, ug/l	7.3	12.1	9.6	15.8	44.8	10.2	1.2	0.4	0.2	0	
Total Mass, g	0.37	0.61	0.48	0.79	2.24	0.51	0.06	0.02	0.01	0	
Total Mass, lb	**0.0008**	**0.0013**	**0.0011**	**0.0017**	**0.0049**	**0.0011**	**0.0001**	**0.0000**	**0.0000**	**0.00**	0.01

*Based on estimated areal extent of dissolved hydrocarbons
**Zmax = estimated vertical extent of dissolved hydrocarbons based on depth to water
***VGW=volume of groundwater

Total Disolved Mass = 0.01 lbs

Total Mass = 1 lbs

Note: MAS typically assumes that the petroleum mass adhered to soils in the source area can be estimated by the concentration of petroleum disolved in the groundwater in static conditions. The mass of petroleum compouunds disolved in the groundwater are estimated as 1% of the mass of petroleum compounds adhered to the soil.

AIR COMPRESSOR DESIGN CALCULATIONS

DESIGN CRITERIA / ASSUMPTIONS:

1. The design flowrate of 2 scfm for the sparge wells.
2. A maximum of 13 air sparge points will be operational. A flow of 26 cfm will be chosen for the total flow as all wells will be operational at one time. AS-13 represents the furthest distance from the compound and represents the worst case scenario for pressure loss due to friction.
3. The injection point is located 32 feet bls with a 2-ft screened interval to allow for the dispersion of the injected air into the saturated zone. Thus, the injection location (to the bottom of the sparge well) would be approximately 10 ft below the static water level. The design accounts for a depth to water of 20 ft bls.
4. The minimum pressure of 0.43 psi/ft represents the pressure required to overcome hydrostatic pressure.
5. The maximum pressure is limited to 0.73 psi/ft in order to prevent fracturing and the injection of uncaptured sparge air resulting from excessive pressures within the soil formation.
6. For design purposes a well depth of 32 feet with 2 feet of screen was assumed at the sparge points. Thus, the sparge system is designed to overcome the friction lossess of 32 feet of vertical well riser and the horizontal run from the well to the manifold.
7. The maximum friction loss (inches H2O/ft tubing) is determined using a nomagraph provided by AMETEK Rotron, Saugerties, NY, assuming 2" diameter tubing and a maximum flow of 2 scfm per well.
8. Utilizes the distance to AS-13, the well furthest from the compound for a worst case scenario.
9. Based on information supplied by Gast Manufacturing Corp.
10. The frictional loss through the rotameter was empirically determined by MAS. All data is for the Dwyer rotameter model RMC-121.
11. Based on informaton supplied by American Industrial Heat Transfer Inc.
12. The total system flowrate is based on operating a maximum of 10 air sparge points simultaneously at a maximum flowrate per sparge point of 2 cfm.
13. This is the pressure which the air compressor should not be operated above to prevent fracturing of the aquifer.

DESIGN CALCULATIONS:

System Flow Rate[1]: 2 scfm per well

Pressure Requirements At Injection Points:

		Pilot Test
Sparge Point[2]	**AS-13**	*AS-1*
Depth of Point[3] (ft)	**32**	*45*
Screen Length (ft)	**2**	*2*
Depth to Water[3] (ft)	**20**	*24*
Max. Hydrostatic Pressure to Overcome (ft H_2O)	**10**	*19*
Breakthrough during pilot test (psi)	**N/A**	*27*
Minimum Design Pressure[4] (psi) (Hydrostatic Pressure (ft H_2O) x 0.43 psi/ft)	**4.3**	*8.17*
Maximum Design Pressure[5] (psi) (Hydrostatic Pressure (ft H_2O) x 0.73 psi/ft)	**21.9**	*31.39*
Backpressure due to lithology (from Pilot Test)		*18.83*

Friction Losses Due to the Well:

Length of Riser[6] (ft)	**30**
Diameter of Sparge well (in)	**2**
2-inch Friction Loss[7] (inches H2O/ft tubing)	**0.014**
Total Friction Loss Due to Well (psi)	**0.42**

Friction Losses In Individual Sparge Lines:

Length of Sparge Line[8] (ft)	**140**
Diameter of Sparge Line (in)	**1**
Number of 45 Degree Elbows	**0**
Equivalent Length of 45° Pipe (Elbows)[9] (ft)	**1.5**
Number of 90 Degree Elbows	**3**
Equivalent Length of 90° Pipe (Elbows)[9] (ft)	**3**
Number of Tees	**0**
Equivalent Length of Pipe (Tees)[9] (ft)	**10.5**
Total length of Pipe (ft)	**149**
1-inch Friction Loss[7] (inches H_2O/ft tubing)	**0.014**
Total Friction Loss Due to Pipe (psi)	**2.09**

Friction Losses Due To Manifold:

Number of 90 Degree Elbows	**3**
Equivalent Length of 90° Pipe (Elbows)[9] (ft)	**3**
Total Length of Pipe (Pipe + Elbows) (ft)	**9**
Friction Loss[7] (inches H_2O/ft tubing)	**0.014**
Total Friction Loss Through Piping (psi)	**0.13**
Friction Loss Through Rotameter[10] (psi)	**1.1**
Friction Loss Through Heat Exchanger[11] (psi)	**1**
Total Friction Loss Due to Manifold (psi)	**2.23**

Required Compressor Performance:

Total System Flowrate[12] (scfm)	**26**
Minimum System Pressure (psi)	**23.56**
Maximum System Pressure[13] (psi)	**26.63**
Compressor capability pressure	**31.42**

SVE BLOWER DESIGN CALCULATIONS

DESIGN CRITERIA / ASSUMPTIONS:

1. The design flowrate per linear feet of vapor extraction well will be around 2 scfm , based on the extraction flow rate per length of exposed screent.

2. The design vacuum of 75 inches of water is expected to be applied based on pilot test activities.

3. The maximum friction loss (inches H2O/ft piping) is determined using a nomagraph provided by Rotron, assuming 2" diameter piping and a flow of 20 scfm.

4. Based on information supplied by Rotron.

5. Based on information supplied by Rotron. Assume manifold is constructed of 3" diameter tees, valves and 90 degree elbows. For individual SVE points.

6. Based on information supplied by Rotron and MAS experience.

7. This performance requirement does not account for pressure losses due to the equipment and appurtenances on the outlet side of the blower (in addition to a 15 foot high discharge stack).

8. The total system flowrate is based on operating SVE-1 through SVE-6 (10' length each) wells at one time.

9. Based on information supplied by Carbonair. Carbon on discharge side of the blower (based on sizing)***

10. Based on MAS's experience, the pressure losses associated with the blower discharge be added to the vacuum losses to determine the correct required performance of the blower. However, these losses are negligible.

DESIGN CALCULATIONS:

System Flow Rate[1]: 120scfm

Friction Losses in Individual SVE Lines:

SVE well	SVE-6
Design Vacuum[2] (inches of water column)	75
Max. # of SVE wells in operation	6
Length of 2-inch SVE Line[2] (ft)	140
Friction Loss[3] (inches H_2O/ft piping)	0.014
Number of Tees	0
Equivalent Length of Pipe (Tees)[4] (ft)	NA
Number of 90 Degree Elbows	5
Equivalent Length of Pipe (Elbows)[4] (ft)	25
Total Friction Loss Due To Pipe (inches H_2O)	2.31

Friction Losses Due to Manifold (3'' diameter):

Number of 90 Degree Elbows	3
Equivalent Length of Pipe (Elbows)[5] (ft)	***7***
Number of Tees (per leg)	1
Equivalent Length of Pipe (Tees)[5] (ft)	***6.5***
Number of Valves (per leg)	1
Equivalent Length of Pipe (Valves)[5] (ft)	***0.90***
Total Length of Pipe[5] (Pipe + Elbows) (ft)	14.4
Friction Loss[5] (inches H_2O/ft piping)	0.082
Total Friction Loss Through Manifold (inches H_2O)	1.18

Other Friction Losses (Total Flow):

Friction Loss from Air Filter[6] (in H_2O)	4
Friction loss from Moisture Separator[6] (in H_2O)	4
Vacuum loss across VGAC9 (inches H2O)***	10
Total Other Friction Loss (inches H_2O)	18

Required Blower Vacuum Performance[7]:

Total System Flowrate[8] (scfm)	120
Required System Vacuum (inches H_2O)	96

Required Blower Performance:

Total System Flowrate[8] (scfm)	60
Design System Vacuum (inches H_2O)	96.5
Design System Vacuum (inches Hg)	7.10
Blower maximum Vacuum (demand), inches H2O	128.6

hf = Kv*v^2/2g
hf = head loss, ft
K = Constant for Valve
V = velocity at ft/s
9=9.81 m/s2 = 32.174 ft/s2

Manifold:

Calculation for 3-inch diamater, Standard Tee

32.174	g, ft/s2
3	diameter of pipe, inches
0.36	K
100	V, cfm
1.666666667	V, cubic feet per second
2880	V, cubic inches per second
7.065	Area of pipe, sq in
0.0490625	Area of pipe, sq ft
407.6433121	inches per second
33.97027601	feet per second
6.456030875	hf

Calculation for 4-inch diamater, Standard Tee

32.174	g, ft/s2
4	diameter of pipe, inches
0.34	K
50	V, cfm
0.833333333	V, cubic feet per second
1440	V, cubic inches per second
12.56	Area of pipe, sq in
0.087222222	Area of pipe, sq ft
114.6496815	inches per second
9.554140127	feet per second
0.4823109	hf

Ball Valves:

Calculation for 3-inch diamater, Standard Tee

32.174	g, ft/s2
3	diameter of pipe, inches
0.05	K
100	V, cfm
1.666666667	V, cubic feet per second
2880	V, cubic inches per second
7.065	Area of pipe, sq in
0.0490625	Area of pipe, sq ft
407.6433121	inches per second
33.97027601	feet per second
0.896670955	hf

Calculation for 4-inch diamater, Standard Tee

32.174	g, ft/s2
4	diameter of pipe, inches
0.05	K
350	V, cfm
5.833333333	V, cubic feet per second
10080	V, cubic inches per second
12.56	Area of pipe, sq in
0.087222222	Area of pipe, sq ft
802.5477707	inches per second
66.87898089	feet per second
3.475475605	hf

VAPOR-PHASE CARBON USAGE CALCULATION SHEET

1.) Carbon Treatment System Information

Estimated BTEX adsorption capacity (by weight)	25 %
Estimated C4-C10 hydrocarbon adsorption capacity (by weight)	25 %
Estimated carbon removal efficiency for BTEX/C4-C10 chs	99 %
Process vapor flow rate*	120 cfm
Discharge duration	24 hours/day
Amount of vapor-phase carbon (primary)**	200 pounds

* Vapor flow rate based on all vapor extraction wells operating.
** Carbon in Series. Measurement of Breakthrough on First Carbon Drum only (Primary).

2.) Process Vapor Stream Analytical Data

constituent	GAC Influent conentration (ppmv)	GAC Influent concentration ** (µg/L)
Benzene	-	3.6
Toluene	-	2.4
Ethylbenzene	-	3.6
Xylenes	-	10
BTEX	-	19.6
C4-C10 HCs	-	1.8

(µg/L) = (mg/m^3)

Based on Pilot Test emissions data, concentrations of TPH of 1.8 mg/m3 and design cfm of 120, a total concentration of effluent is estimated as follows:

0.019592 lbs/day (based on TPH)

3.) Pre-Treatment System Loadings

Vapor volume removed/treated per day	172,800 ft^3/day
Pre-treatment BTEX loading	0.211 lbs/day
Pre-treatment C4-C10 CH loading	0.019 lbs/day

4.) Effluent Concentrations and Loading

Effluent BTEX concentration	0.196 µg/L
Effluent C4-C10 HC concentration	0.018 µg/L
Effluent BTEX loading	0.002 lbs/day
Effluent C4-C10 HC loading	0.000 lbs/day

5.) Carbon Usage and Removal Efficiency

Carbon used by BTEX	0.844 lbs/day
Carbon used by C4-C10 HCs	0.078 lbs/day
Total carbon usage rate	**0.92 lbs/day**
Time until breakthrough of carbon unit(s)	**216.9 days**

NOTES:

lb/day loading = $\frac{\text{conc. (µg/L)}}{} \cdot \frac{1\text{ mg}}{1{,}000\text{ µg}} \cdot \frac{1\text{ lb}}{454{,}000\text{ mg}} \cdot \frac{1{,}000\text{ L}}{m^3} \cdot \frac{0.0283\text{ m}^3}{ft^3} \cdot \text{flowrate (ft}^3\text{/day)}$

lb carbon used = lb HCs removed/(%adsorption)

µg/L = $\text{ppmv} \cdot \frac{\text{molecular weight}}{24.05\text{ L/mol}}$

C4-C10 HC mol wt = 90

Cleanup Time Input Sheet

10	k = number of injection points
10	Roi = radius of influence of each injection point (ft)
23	H = depth of screen below water table (ft)
100	f = percent of groundwater plume being influence by system
100	d = percent of day (24 hrs) that the sparging system will be operated.
4	Q = total injected air flow rate per well

CONCENTRATIONS (ppb)

7	Benzene
12	Toluene
10	Ethylbenzene
16	Total Xylenes
45	MTBE
1	Naphthalene
0	1-Methylnaphthalene
0	2-Methylnaphthalene
0	TRPH

CLEANUP TIME ESTIMATE - BENZENE

Reduction is based on the First Order Decay equation defined by the following:

Reference: Air Sparging Model of Predicting Groundwater Cleanup Rate, Sellers & Schreiber

$$C_t = C_o e^{-Bt}$$

C_o = initial average Benzene concentration
C_t = cleanup standard for Benzene
B = decay coefficient calculated using site specific parameters
t = time to reach cleanup standard

where: $B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f = fraction of the groundwater plume being influenced
d = fraction of a 24 hour day that the sparging system is operated
D = contaminant diffusion coefficient in water (1 x 10^{-5} cm^2/sec estimated for non-polar VOCs)
L = diffusive distance around bubble (literature range of 0.5 - 2 mm), assumed equal to bubble radius, r
S/V = average effective surface to volume ratio of a bubble, estimated using bubble readius (S/V = 3/r)
H = depth of screen below groundwater table
v = bubble terminal rise velocity (0.25 m/sec assumed for subsurface with uniformly high porosity)
Q = total injected air flow rate into groundwater
V_s = volume of water in the contaminant plume in contact with sparging bubbles

and: $V_s = k\pi R_{oi}^2 Hn$

k = number of injection points
R_{oi} = radius of influence of each injection point
H = depth of screen below groundwater table
n = subsurface porosity

Calculations

$V_s = k\pi R_{oi}^2 Hn$

k	=	10	site specific
R_{oi}	=	3.0 m	assumed 10 feet bls.
H	=	7.0 m	site specific (23 feet).
n	=	0.3	literature for sand
V_s	=	**614 m^3**	**calculated**

$B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f	=	1.0	site specific
d	=	1.0	site specific
D	=	1.00E-05	literature
L	=	1.50 mm	literature
S/V	=	2.00	calculated from L
H	=	7.0 m	site specific
v	=	0.25 m/sec	literature
Q	=	0.0189 m^3/sec	site specific (4.0 cfm/well).
V_s	=	613.82398 m^3	calculated above
B	=	**1.149E-06 sec^{-1}**	**calculated**

$t = -(1/B)\ln(C_t/C_o)$

	=	7 ppb	Highest recent benzene concentration
	=	1 ppb	Cleanup standard for benzene
	=	19.6 days	Predicted Time to Cleanup
	=	0.05 Years	
	=	**0.2 Years**	**With 3x Safety Factor**

CLEANUP TIME ESTIMATE - ETHYLBENZENE

Reduction is based on the First Order Decay equation defined by the following:

Reference: Air Sparging Model of Predicting Groundwater Cleanup Rate, Sellers & Schreiber

$$C_t = C_o e^{-Bt}$$

C_o = initial average Ethylbenzene concentration
C_t = cleanup standard for Ethylbenzene
B = decay coefficient calculated using site specific parameters
t = time to reach cleanup standard

where: $B = fd(D/L)(S/V)(H/v)(Q/V_s)$

- f = fraction of the groundwater plume being influenced
- d = fraction of a 24 hour day that the sparging system is operated
- D = contaminant diffusion coefficient in water (1 x 10^{-5} cm^2/sec estimated for non-polar VOCs)
- L = diffusive distance around bubble (literature range of 0.5 - 2 mm), assumed equal to bubble radius, r
- S/V = average effective surface to volume ratio of a bubble, estimated using bubble readius (S/V = 3/r)
- H = depth of screen below groundwater table
- v = bubble terminal rise velocity (0.25 m/sec assumed for subsurface with uniformly high porosity)
- Q = total injected air flow rate into groundwater
- V_s = volume of water in the contaminant plume in contact with sparging bubbles

and: $V_s = k\pi R_{oi}^{\ 2}Hn$

- k = number of injection points
- R_{oi} = radius of influence of each injection point
- H = depth of screen below groundwater table
- n = subsurface porosity

Calculations

$V_s = k\pi R_{oi}^{\ 2}Hn$

k	=	10		site specific
R_{oi}	=	3.0	m	assumed (10 ft)
H	=	7.0	m	site specific (14 ft)
n	=	0.3		literature for sand
V_s	=	**614**	**m^3**	**calculated**

$B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f	=	1.0		site specific
d	=	1.0		site specific
D	=	1.00E-05		literature
L	=	1.50	mm	literature
S/V	=	2.00		calculated from L
H	=	7.0	m	site specific
v	=	0.25	m/sec	literature
Q	=	0.0189	m^3/sec	(8.0 cfm/well)
V_s	=	613.82398	m^3	calculated above
B	=	**1.149E-06**	**sec^{-1}**	**calculated**

$t = -(1/B)\ln(C_t/C_o)$

	=	10	ppb	Highest recent benzene concentration
	=	30	ppb	Cleanup standard for Ethylbenzene
	=	-11.1	days	Predicted Time to Cleanup
	=	-0.03	Years	
	=	**-0.1**	**Years**	**With 3x Safety Factor**

CLEANUP TIME ESTIMATE - TOTAL XYLENE

Reduction is based on the First Order Decay equation defined by the following:

Reference: Air Sparging Model of Predicting Groundwater Cleanup Rate, Sellers & Schreiber

$$C_t = C_o e^{-Bt}$$

C_o = initial average Xylene concentration
C_t = cleanup standard for Xylene
B = decay coefficient calculated using site specific parameters
t = time to reach cleanup standard

where: $B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f	= fraction of the groundwater plume being influenced
d	= fraction of a 24 hour day that the sparging system is operated
D	= contaminant diffusion coefficient in water (1 x 10^{-5} cm^2/sec estimated for non-polar VOCs)
L	= diffusive distance around bubble (literature range of 0.5 - 2 mm), assumed equal to bubble radius, r
S/V	= average effective surface to volume ratio of a bubble, estimated using bubble readius (S/V = 3/r)
H	= depth of screen below groundwater table
v	= bubble terminal rise velocity (0.25 m/sec assumed for subsurface with uniformly high porosity)
Q	= total injected air flow rate into groundwater
V_s	= volume of water in the contaminant plume in contact with sparging bubbles

and: $V_s = k\pi R_{oi}{}^2 Hn$

k = number of injection points
R_{oi} = radius of influence of each injection point
H = depth of screen below groundwater table
n = subsurface porosity

Calculations

$V_s = k\pi R_{oi}{}^2 Hn$

k	=	10		site specific
R_{oi}	=	3.0	m	assumed 10 feet bls.
H	=	7.0	m	site specific (23 feet).
n	=	0.3		literature for sand
V_s	=	**614**	**m^3**	**calculated**

$B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f	=	1.0		site specific
d	=	1.0		site specific
D	=	1.00E-05		literature
L	=	1.50	mm	literature
S/V	=	2.00		calculated from L
H	=	7.0	m	site specific
v	=	0.25	m/sec	literature
Q	=	0.0189	m^3/sec	site specific (4.0 cfm/well).
V_s	=	613.82398	m^3	calculated above
B	=	**1.149E-06**	**sec^{-1}**	**calculated**

$t = -(1/B)\ln(C_t/C_o)$

C_o	=	16	ppb	Highest recent benzene concentration
C_t	=	20	ppb	Cleanup standard for Xylene
t	=	-2.2	days	Predicted Time to Cleanup
t	=	-0.01	Years	
t	=	**0.0**	**Years**	**With 3x Safety Factor**

CLEANUP TIME ESTIMATE - Naphthalene

Reduction is based on the First Order Decay equation defined by the following:

Reference: Air Sparging Model of Predicting Groundwater Cleanup Rate, Sellers & Schreiber

$$C_t = C_o e^{-Bt}$$

C_o = initial average Naphthalene concentration
C_t = cleanup standard for Naphthalene
B = decay coefficient calculated using site specific parameters
t = time to reach cleanup standard

where: $B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f = fraction of the groundwater plume being influenced
d = fraction of a 24 hour day that the sparging system is operated
D = contaminant diffusion coefficient in water (1 x 10^{-5} cm^2/sec estimated for non-polar VOCs)
L = diffusive distance around bubble (literature range of 0.5 - 2 mm), assumed equal to bubble radius, r
S/V = average effective surface to volume ratio of a bubble, estimated using bubble readius (S/V = 3/r)
H = depth of screen below groundwater table
v = bubble terminal rise velocity (0.25 m/sec assumed for subsurface with uniformly high porosity)
Q = total injected air flow rate into groundwater
V_s = volume of water in the contaminant plume in contact with sparging bubbles

and: $V_s = k\pi R_{oi}{}^2 Hn$

k = number of injection points
R_{oi} = radius of influence of each injection point
H = depth of screen below groundwater table
n = subsurface porosity

Calculations

$V_s = k\pi R_{oi}{}^2 Hn$

k	=	10		site specific
R_{oi}	=	3.0	m	assumed (10 ft)
H	=	7.0	m	site specific (14 ft)
n	=	0.3		literature for sand
V_s	=	**614**	**m^3**	**calculated**

$B = fd(D/L)(S/V)(H/v)(Q/V_s)$

f	=	1.0		site specific
d	=	1.0		site specific
D	=	1.00E-05		literature
L	=	1.50	mm	literature
S/V	=	2.00		calculated from L
H	=	7.0	m	site specific
v	=	0.25	m/sec	literature
Q	=	0.0189	m^3/sec	(8.0 cfm/well)
V_s	=	613.82398	m^3	calculated above
B	=	**1.149E-06**	**sec^{-1}**	**calculated**

$t = -(1/B)\ln(C_t/C_o)$

=	1	ppb	Highest recent benzene concentration
=	20	ppb	Cleanup standard for Naphthalene
=	-30.2	days	Predicted Time to Cleanup
=	-0.08	Years	
=	**-0.2**	**Years**	**With 3x Safety Factor**

Application Engineering Basics

Throughout our catalog, you will find terminology used for air moving selection and product sizing. Below are a few of the key terms:

Flow

- Volume Rate/Time
- Charts are in SCFM, m^3/min, or L/S
- SCFM = Standard Cubic Feet Per Minute (American) where temperature = 68°F, air density = 0.075 lb/cubic foot, and altitude = 0 feet above sea level
- M^3/min = Cubic Meters Per Minute (Metric)
- L/sec = Liters Per Second (Metric)
- 1 m^3/min = 35.3 SCFM
- 1 L/sec = 2.119 SCFM
- See Standard Engineering Conversions for other flows on pg. I-2

Pressure

- Force/Area
- Rotron charts are in IWG, PSIG, MM of Water, IHG, or mbar
- IWG = Inches of Water Gauge (American)
- PSIG = Pounds Per Square Inch Gauge (American)
- MM of Water = Millimeter of Water Gauge (Metric)
- IHG = Inches of Mercury Gauge (American)
- mbar = Millibar Gauge (Metric)
- PSIA = Pounds Per Square Inch Absolute (American)
- 27.7 IWG = 1 PSIG
- 703.58 MM of Water = 1 PSIG
- 2.036 IHG = 1 PSIG
- 0.069 Bars = 69 mbar = 1 PSIG
- Standard Atmosphere = 0 PSIG = 14.7 PSIA
- See Basic Fan Laws Chart for correcting pressure due to speed or density changes on pgs. I-5 and I-6

Density

- Weight/Volume
- Standard Air = 0.075 lb/cubic foot
- See Density Chart for other gases on pg. I-4
- See Density Correction Chart due to altitude and temperature changes on pg. I-3

Specific Gravity

- Density Ratio Relative to Air
- Standard Air SG = 1.0
- Methane SG = 0.55
- See Specific Gravity Chart for other gases on pg. I-4

Velocity

- Distance/Time or Flow/Area
- FPM = Feet Per Minute (American)
- MPH = Miles Per Hour (American)
- M/min = Meters Per Minute (Metric)
- Km/h = Kilometers Per Hour (Metric)
- 88 FPM = 1 MPH
- 26.82 M/min = 1 MPH
- 1.609 Km/h = 1 MPH
- See Standard Engineering Conversion Chart for other velocities on pg. I-2
- See Orifice Flow Calculation Chart for air flow equations on pg. I-7

Pressure Drop/Back Pressure/Impedance

- Friction causes air to slow down and lost energy is measured in pressure drop terms
- Typical pressure drop areas include piping, elbows, accessories and system
- Each fixed system has a fixed system impedance caused by a single or multiple pressure drop points
- Changing the system impedance will cause blowers work point to change
- Changing the blower with fixed system impedance will change the working back pressure
- See Friction Loss Per Foot of Tubing and Fitting Charts on pg. I-8

Application Engineering Basics

Standard Engineering Conversions

MULTIPLY	BY	TO OBTAIN
Atmospheres	76.0	Cms. of Mercury
Atmospheres	29.92	Inches of Mercury
Atmospheres	33.90	Feet of Water
Atmospheres	10,333	Kgs./Sq. Inch
Atmospheres	1.013×10^{5}	Pascals
Atmospheres	14.70	Pounds/Sq. Inch
Atmospheres	760	Torrs
Bars	0.9869	Atmospheres
Bars	$1. \times 10^{6}$	Dynes/Sq. Cm.
Bars	1.020×10^{4}	Kgs./Square Meter
Bars	14.50	Pounds/Sq. Inch
British Thermal Units	0.2520	Kilogram-Calories
British Thermal Units	777.5	Foot-Pounds
British Thermal Units	3.927×10^{-4}	Horsepower-Hours
British Thermal Units	1054	Joules
British Thermal Units	107.5	Kilogram-Meters
British Thermal Units	2.928×10^{-4}	Kilowatt-Hours
Centimeters of Mercury	0.01316	Atmospheres
Centimeters of Mercury	0.4461	Feet of Water
Centimeters of Mercury	136.0	Kgs./Square Meter
Centimeters of Mercury	0.1934	Pounds/Sq. Inch
Centimeters/Second	1.969	Feet/Minute
Centimeters/Second	0.6	Meters/Minute
Cubic Centimeters	3.531×10^{-5}	Cubic Feet
Cubic Centimeters	6.102×10^{-2}	Cubic Inches
Cubic Centimeters	10^{-6}	Cubic Meters
Cubic Centimeters	10^{-3}	Liters
Cubic Feet	2.832×10^{4}	Cubic Cms.
Cubic Feet	1728	Cubic Inches
Cubic Feet	0.02832	Cubic Meters
Cubic Feet	0.03704	Cubic Yards
Cibic Feet	7.481	Gallons
Cubic Feet	28.32	Liters
Cu. Ft. of Water (60°F)	62.37	Pounds
Cubic Feet/Minute	472.0	Cubic Cms./Sec.
Cubic Feet/Minute	0.4720	Liters/Second
Cubic Feet/Minute	62.4	Lbs. of Water/Min.
Cubic Inches	16.39	Cubic Centimeters
Cubic Inches	5.787×10^{-4}	Cubic Feet
Cubic Inches	1.639×10^{-5}	Cubic Meters
Cubic Inches	2.143×10^{-5}	Cubic Yards
Cubic Meters	10^{6}	Cubic Centimeters
Cubic Meters	35.31	Cubic Feet
Cubic Meters	61,023	Cubic Inches
Cubic Meters	1.308	Cubic Yards
Cubic Yards	7.646×10^{5}	Cubic Centimeters
Cubic Yards	27	Cubic Feet
Cubic Yards	46,656	Cubic Inches
Cubic Yards	0.7646	Cubic Meters
Feet	30.48	Centimeters
Feet	12	Inches
Feet	0.3048	Meters
Feet	1/3	Yards
Feet of Air (1 atmosphere 60°F)	5.30×10^{-4}	Pounds/Square Inch
Feet/Minute	0.5080	Centimeters/Sec.
Feet/Minute	0.01667	Feet/Second
Feet/Minute	0.01829	Kilometers/Hour
Feet/Minute	0.3048	Meters/Minute
Feet/Minute	0.01136	Miles/Hour
Grams/Cu. Cm.	62.43	Pounds/Cubic Foot
Horsepower	42.44	British Thermal Units/Min.
Horsepower	33,000	Foot-Pounds/Min.
Horsepower	10.70	Kg.-Calories/Min.
Horsepower	745.7	Watts
Horsepower-Hours	2547	British Thermal Units
Inches	2.540	Centimeters
Inches	10^{3}	Mils
Inches of Mercury	0.03342	Atmospheres
Inches of Mercury	13.60	Inches of Water
Inches of Mercury	345.3	Kgs./Square Meter
Inches of Mercury	25.40	Mms. of Mercury
Inches of Mercury	0.4912	Pounds/Square In.
Inches of Water	0.002458	Atmospheres
Inches of Water	0.07355	Inches of Mercury
Inches of Water	25.40	Kgs./Square Meter
Inches of Water	5.204	Pounds/Square Ft.
Inches of Water	0.03613	Pounds/Square In.

MULTIPLY	BY	TO OBTAIN
KGS./Cubic Meter	0.06243	Pounds/Cubic Foot
Kilometers	3281	Feet
Kilowatts	56.92	British Thermal Units/Min.
Kilowatts	737.6	Foot-Pounds/Sec.
Kilowatts	1.341	Horsepower
Kilowatts	14.34	Kg.-Calories/Min.
Kilowatt-Hours	3415	British Thermal Units
Liters	10^{3}	Cubic Centimeters
Liters	61.02	Cubic Inches
Liters	10^{-3}	Cubic Meters
$Log_{10}N$	2.303	$Log_{E}N$ or Ln N
Log N or Ln N	0.4343	$Log_{10}N$
Meters	100	Centimeters
Meters	3.2808	Feet
Meters	39.37	Inches
Meters	10^{-3}	Kilometers
Meters/Minute	1.667	Centimeters/Sec.
Meters/Minute	3.281	Feet/Minute
Meters/Minute	0.06	Kilometers/Hour
Meters/Minute	0.03728	Miles/Hour
Miles	5280	Feet
Miles	1.6093	Kilometers
Miles	1760	Yards
Miles/Hour	44.70	Centimeters/Sec.
Miles/Hour	88	Feet/Minute
Miles/Hour	1,467	Feet/Second
Miles/Hour	1.6093	Kilometers/Hour
Miles/Hour	26.82	Meters/Minute
Mms. of Mercury	0.0394	Inches of Mercury
Mms. of Mercury	1.3595^{-3}	Kgs./Square Cm.
Mms. of Mercury	0.01934	Pounds/Square Inch
Pints (Liq.)	28.87	Cubic Inches
Pints (U.S. liquid)	473,179	Cubic Centimeters
Pints (U.S. liquid)	16	Ounces (U.S. fluid)
Pounds	444,823	Dynes
Pounds	453.6	Grams
Pounds	16	Ounces
Pounds of Carbon to CO^{2}	14,544	British Thermal Units (mean)
Pounds of Water	27.68	Cubic Inches
Pounds of Water	0.1198	Gallons
Pounds of Water Evaporated at 212°F	970.3	British Thermal Units
Pounds/Cubic Foot	16.02	Kgs./Cubic Meter
Pounds/Square Foot	4,882	Kgs./Square Meter
Pounds/Square Inch	0.06804	Atmospheres
Pounds/Square Inch	27.7	Inches of Water
Pounds/Square Inch	2.036	Inches of Mercury
Pounds/Square Inch	703.1	Kgs./Square Meter
Pounds/Square Inch	6.895×10^{3}	Pascals
Pounds/Square Inch	51.715	Millimeters of Mercury at 0°C
Square Centimeters	1.973×10^{5}	Circular Mils
Square Centimeters	1.076×10^{-3}	Square Feet
Square Centimeters	0.1550	Square Inches
Square Feet	929.0	Square Centimeters
Square Feet	0.09290	Square Meters
Square Inches	1.273×10^{6}	Circular Mils
Square Inches	6.452	Square Centimeters
Square Inches	6.944×10^{-3}	Square Feet
Square Inches	10^{6}	Square Mils
Square Inches	645.2	Square Millimeters
Square Kilometers	10.76×10^{6}	Square Feet
Square Kilometers	10^{6}	Square Meters
Square Kilometers	1.196×10^{6}	Square Yards
Square Meters	10.764	Square Feet
Square Meters	1.196	Square Yards
Temp. (Degs. C.) + 273	1	Abs. Temp. (Degs. C.)
Temp. (Degs. C.) + 17.8	1.8	Temp. (Degs. Fahr.)
Temp. (Degs. F.) + 460	1	Abs. Temp. (Degs. F.)
Temp. (Degs. F.) -32	5/9	Temp. (Degs. Cent.)
Watts	0.05692	British Thermal Units/Min.
Watts	10^{7}	Ergs/Second
Watts	44.26	Foot-Pounds/Min.
Watts	1.341×10^{-3}	Horsepower
Watts	0.01434	Kg.-Calories/Min.
Watts	10^{-3}	Kilowatts
Watts-Hour	3.415	British Thermal Units
Watts-Hour	1.341 x 10-	Horsepower/Hours
Watts-Hour	10^{-3}	Kilowatt-Hours

Application Engineering Basics

Density Correction Chart

EQUATION:

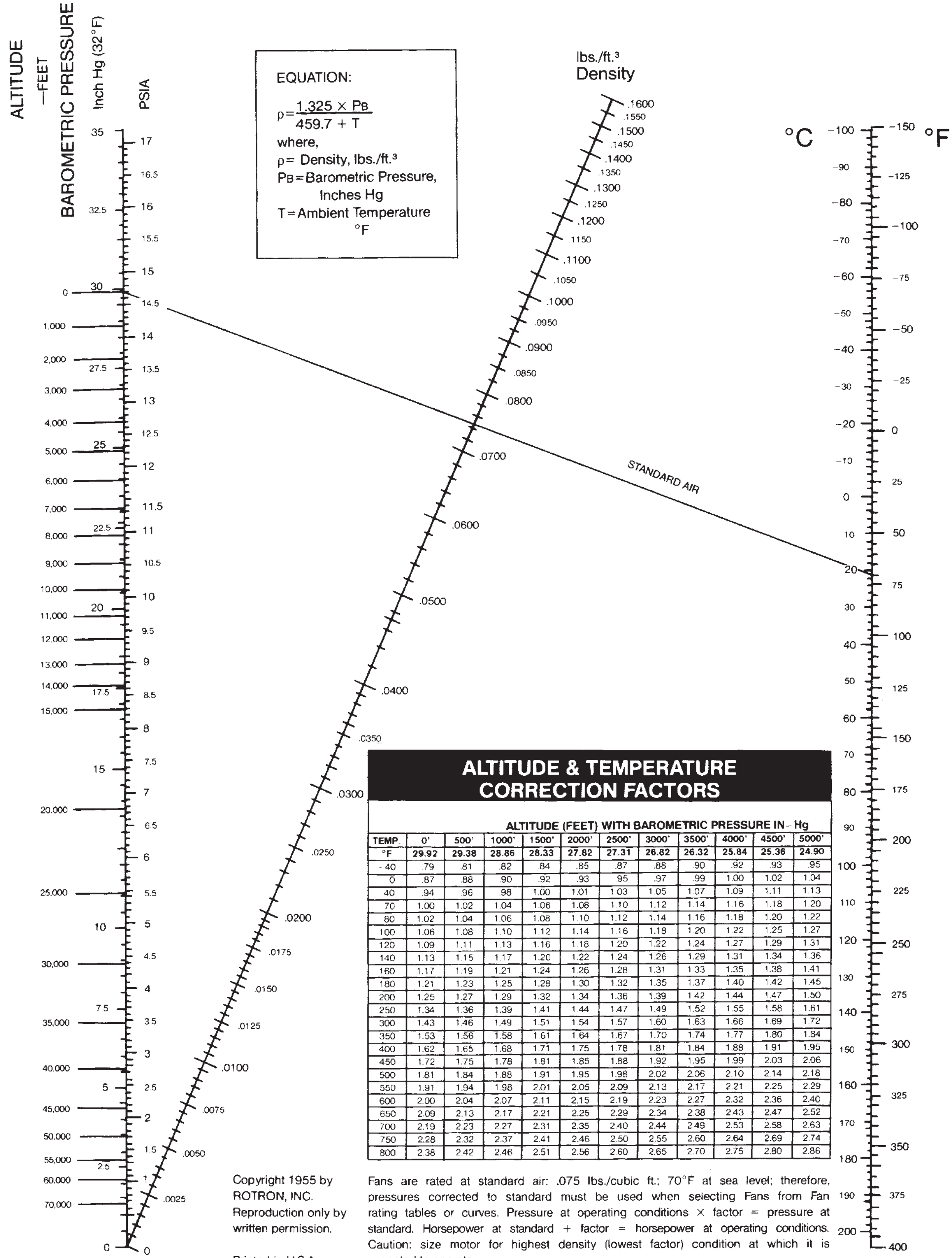
$$\rho = \frac{1.325 \times P_B}{459.7 + T}$$

where,

ρ = Density, lbs./ft.^{3}

P_B = Barometric Pressure, Inches Hg

T = Ambient Temperature °F



ALTITUDE & TEMPERATURE CORRECTION FACTORS

TEMP.	ALTITUDE (FEET) WITH BAROMETRIC PRESSURE IN - Hg										
	0'	500'	1000'	1500'	2000'	2500'	3000'	3500'	4000'	4500'	5000'
°F	29.92	29.38	28.86	28.33	27.82	27.31	26.82	26.32	25.84	25.36	24.90
-40	.79	.81	.82	.84	.85	.87	.88	.90	.92	.93	.95
0	.87	.88	.90	.92	.93	.95	.97	.99	1.00	1.02	1.04
40	.94	.96	.98	1.00	1.01	1.03	1.05	1.07	1.09	1.11	1.13
70	1.00	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20
80	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20	1.22
100	1.06	1.08	1.10	1.12	1.14	1.16	1.18	1.20	1.22	1.25	1.27
120	1.09	1.11	1.13	1.16	1.18	1.20	1.22	1.24	1.27	1.29	1.31
140	1.13	1.15	1.17	1.20	1.22	1.24	1.26	1.29	1.31	1.34	1.36
160	1.17	1.19	1.21	1.24	1.26	1.28	1.31	1.33	1.35	1.38	1.41
180	1.21	1.23	1.25	1.28	1.30	1.32	1.35	1.37	1.40	1.42	1.45
200	1.25	1.27	1.29	1.32	1.34	1.36	1.39	1.42	1.44	1.47	1.50
250	1.34	1.36	1.39	1.41	1.44	1.47	1.49	1.52	1.55	1.58	1.61
300	1.43	1.46	1.49	1.51	1.54	1.57	1.60	1.63	1.66	1.69	1.72
350	1.53	1.56	1.58	1.61	1.64	1.67	1.70	1.74	1.77	1.80	1.84
400	1.62	1.65	1.68	1.71	1.75	1.78	1.81	1.84	1.88	1.91	1.95
450	1.72	1.75	1.78	1.81	1.85	1.88	1.92	1.95	1.99	2.03	2.06
500	1.81	1.84	1.88	1.91	1.95	1.98	2.02	2.06	2.10	2.14	2.18
550	1.91	1.94	1.98	2.01	2.05	2.09	2.13	2.17	2.21	2.25	2.29
600	2.00	2.04	2.07	2.11	2.15	2.19	2.23	2.27	2.32	2.36	2.40
650	2.09	2.13	2.17	2.21	2.25	2.29	2.34	2.38	2.43	2.47	2.52
700	2.19	2.23	2.27	2.31	2.35	2.40	2.44	2.49	2.53	2.58	2.63
750	2.28	2.32	2.37	2.41	2.46	2.50	2.55	2.60	2.64	2.69	2.74
800	2.38	2.42	2.46	2.51	2.56	2.60	2.65	2.70	2.75	2.80	2.86

Fans are rated at standard air: .075 lbs./cubic ft.; 70°F at sea level; therefore, pressures corrected to standard must be used when selecting Fans from Fan rating tables or curves. Pressure at operating conditions × factor = pressure at standard. Horsepower at standard + factor = horsepower at operating conditions. Caution: size motor for highest density (lowest factor) condition at which it is expected to operate.

Application Engineering Basics

Specific Gravity and Density of Various Gases at 60°F (1 ATM)

Gas or Vapor	Chemical Formula	Specific Gravity	Density (lbs./cu/ ft.)
Acetylene	C_2H_2	0.899	.0686
Air	–	1.00	.0763
Ammonia	NH_3	0.587	.0454
Argon	A	1.377	.1053
Benzene	C_6H_6	2.70	.205
Carbon Dioxide	CO_2	1.539	.1166
Chlorine	Cl_2	2.448	.0738
Ethane	C_2H_6	1.038	.0799
Ethylene	C_2H_4	0.969	.0739
Helium	He	0.138	.01054
Hydrogen	H_2	0.0695	.00531
Hydrogen Sulfide	H_2S	1.19	.0897
Methane	CH_4	0.555	.0424
Methyl Chloride	CH_3Cl	1.785	.1356
Nitrogen	N_2	0.967	.0738
Oxygen	O_2	1.105	.0843
Propane	C_3H_8	1.55	.1180
Sulfer Oxide	SO_2	2.26	.1720
Water Vapor	H_2O	0.622	.0373

Explosive Atmosphere Classification

North American	European	
Class I	**Zone 1**	
Group A	**Group II C**	Acetylene
Group B	**Group II C**	Hydrogen or equivalent hazard
Group C	**Group II B**	Ethyle ether vapors, ethylene or cyclopropane
Group D	**Group II A**	Gasoline, hexane, naptha, benzene, butane, alcohol, acetone, benzol, lacquer vapors or natural gas
Class II		
Group E	—	Metal dust
Group F	—	Carbon black, coal or coke dust
Group G	—	Flour, starch or grain

Temperature Conversion Chart

*In the center column, find the temperature to be converted. The equivalent temperature is in the left column, if converting to Celsius, and in the right column, if converting to Fahrenheit.

°C	Temp	°F	°C	Temp	°F	°C	Temp	°F	°C	Temp	°F
-78.9	-110	-166	1.7	35	95.0	27.2	81	177.8	182	360	680
-73.3	-100	-148	2.2	36	96.8	27.8	82	179.6	188	370	698
-67.8	-90	-130	2.8	37	98.6	28.3	83	181.4	193	380	716
-62.2	-80	-112	3.3	38	100.4	28.9	84	183.2	199	390	734
-56.7	-70	-94	3.9	39	102.2	29.4	85	185.0	204	400	752
-51.1	-60	-76	4.4	40	104.0	30.0	86	186.8	210	410	770
-45.6	-50	-58	5.0	41	105.8	30.6	87	188.6	216	420	788
-40.0	-40	-40	5.6	42	107.6	31.1	88	190.4	221	430	806
-34.4	-30	-22	6.1	43	109.4	31.7	89	192.2	227	440	824
-28.9	-20	-4	6.7	44	111.2	32.2	90	194.0	232	450	842
-23.3	-10	14	7.2	45	113.0	32.8	91	195.8	238	460	860
-17.8	0	32	7.8	46	114.8	33.3	92	197.6	243	470	878
-17.2	1	33.8	8.3	47	116.6	33.9	93	199.4	249	480	896
-16.7	2	35.6	8.9	48	118.4	34.4	94	201.2	254	490	914
-16.1	3	37.4	9.4	49	120.2	35.0	95	203.0	260	500	932
-15.6	4	39.2	10.0	50	122.0	35.6	96	204.8	266	510	950
-15.0	5	41.0	10.6	51	123.8	36.1	97	206.6	271	520	968
-14.4	6	42.8	11.1	52	125.6	36.7	98	208.4	277	530	986
-13.9	7	44.6	11.7	53	127.4	37.2	99	210.2	282	540	1004
-13.3	8	46.4	12.2	54	129.2	37.8	100	212.0	288	550	1022
-12.8	9	48.2	12.8	55	131.0	43	110	230	293	560	1040
-12.2	10	50.0	13.3	56	132.8	49	120	248	299	570	1058
-11.7	11	51.8	13.9	57	134.6	54	130	266	304	580	1076
-11.1	12	53.6	14.4	58	136.4	60	140	284	310	590	1094
-10.6	13	55.4	15.0	59	138.2	66	150	302	316	600	1112
-10.0	14	57.2	15.6	60	140.0	71	160	320	321	610	1130
-9.4	15	59.0	16.1	61	141.8	77	170	338	327	620	1148
-8.9	16	60.8	16.7	62	143.6	82	180	356	332	630	1166
-8.3	17	62.6	17.2	63	145.4	88	190	374	338	640	1184
-7.8	18	64.4	17.8	64	147.2	93	200	392	343	650	1202
-7.2	19	66.2	18.3	65	149.0	99	210	410	349	660	1220
-6.7	20	68.0	18.9	66	150.8	100	212	413	354	670	1238
-6.1	21	69.8	19.4	67	152.6	104	220	428	360	680	1256
-5.6	22	71.6	20.0	68	154.4	110	230	446	366	690	1274
-5.0	23	73.4	20.6	69	156.2	116	240	464	371	700	1292
-4.4	24	75.2	21.1	70	158.0	121	250	482	377	710	1310
-3.9	25	77.0	21.7	71	159.8	127	260	500	382	720	1328
-3.3	26	78.8	22.2	72	161.6	132	270	518	388	730	1346
-2.8	27	80.6	22.8	73	163.4	138	280	536	393	740	1364
-2.2	28	82.4	23.3	74	165.2	143	290	554	399	750	1382
-1.7	29	84.2	23.9	75	167.0	149	300	572	404	760	1400
-1.1	30	86.0	24.4	76	168.8	154	310	590	410	770	1418
-0.6	31	87.8	25.0	77	170.6	160	320	608	416	780	1436
0	32	89.6	25.6	78	172.4	166	330	626	421	790	1454
0.6	33	91.4	26.1	79	174.2	171	340	644	427	800	1472
1.1	34	93.2	26.7	80	176.0	177	350	662	432	810	1490

°F = 9/5C + 32   ABSOLUTE RANKIN (R) R = °F + 460
°C = 5/9 (F - 32)   ABSOLUTE KELVIN (K) K = °C + 273

NEMA Classifications

NEMA

- **Type 1** – General Purpose – Indoor
- **Type 2** – Dripproof – Indoor
- **Type 3** – Dusttight, Raintight and Sleet (Ice) Resistant – Outdoor
- **3R** – Rainproof and Sleet (Ice) Resistant – Outdoor
- **3S** – Dusttight, Raintight and Sleet (Ice) Proof – Outdoor
- **Type 4** – Watertight and Dusttight – Indoor
- **4X** – Watertight, Dusttight and Corrosion Resistant – Outdoor
- **Type 5** – Superseded by Type 12 for Control Apparatus
- **Type 6** – Submersible, Watertight, Dusttight and Sleet Resistant – Indoor and Outdoor
- **Type 7** – Class I, Group A, B, C or D Hazardous Locations; Air Break Equipment – Indoor
- **Type 8** – Class I, Group A, B, C or D Hazardous Locations; Oil-immersed Equipment – Indoor
- **Type 9** – Class II, Group E, F or G Hazardous Locations; Air-break Equipment – Indoor
- **Type 10** – Bureau of Mines
- **Type 11** – Corrosion Resistant and Dripproof; Oil-immersed – Indoor
- **Type 12** – Industrial Use, Dusttight and Driptight – Indoor
- **Type 13** – Oiltight and Dusttight – Indoor

Ref: NEMA Standards Publication, Pub. No. 1CS–1970

Application Engineering Basics

Physical Laws for Blower Applications

In the following formulae these symbols are used:

P – Pressure in pounds per square inch (PSI) or inches of mercury column (inches Hg)
CFM – Volume in cubic feet per minute
RPM – Speed in revolutions per minute
D – Density in pounds per cubic foot (lbs./cu. ft.)
H – Height of air or gas column (ft.)
SG – Specific Gravity (ratio of density of gas to the density of air)

"Standard Air" – Air at 68°F (absolute temperature 528°) and 29.92" Hg. (barometric pressure at sea level). The density of such air is 0.075 lbs./cu. ft. and the specific volume is 13.29 cu. ft./lb. The specific gravity is 1.0.

The outlet pressure of a blower depends on the condition of the air or gas at the inlet. The inlet condition is influenced by:
a – Specific gravity (The ratio of density of the gas to density of standard air)
b – Altitude (location of blower)
c – Temperature of inlet air

Basic Fan Laws Chart

VARIABLE	VOLUME	PRESSURE	HORSEPOWER
WHEN SPEED CHANGES	Varies DIRECT with Speed Ratio $CFM_2 = CFM_1 \left(\frac{RPM_2}{RPM_1}\right)$	Varies with SQUARE of Speed Ratio $P_2 = P_1 \left(\frac{RPM_2}{RPM_1}\right)^2$	Varies with CUBE of Speed Ratio $HP_2 = HP_1 \left(\frac{RPM_2}{RPM_1}\right)^3$
WHEN DENSITY CHANGES	Does Not Change	Varies DIRECT with Density Ratio $P_2 = P_1 \left(\frac{D_2}{D_1}\right)$	Varies DIRECT with Density Ratio $HP_2 = HP_1 \left(\frac{D_2}{D_1}\right)$

Volume

The Volume changes in *direct* ratio to the speed.
Example – A blower is operating at 3500 RPM and delivering 1000 CFM. If the speed is reduced to 3000 RPM, what is the new volume?

V_1 = Original Volume (1000 CFM)
V_2 = New Volume
RPM_1 = Original Speed (3500 RPM)
RPM_2 = New Speed (3000 RPM)

$$V_2 = V_1 \left(\frac{RPM_2}{RPM_1}\right)^1 = 1000 \times \left(\frac{3000}{3500}\right)^1 = 1000 \times .857 = 857 \text{ CFM}$$

Pressure

Pressure (barometric) varies in direct proportion to altitude.
Example – A blower is to operate at an elevation of 6000 feet and is to deliver 3 PSI pressure. What pressure (standard air) blower is required?

$$\text{Pressure} = 3 \times \frac{29.92}{23.98} = 3.75 \text{ or } 3\ 3/4 \text{ lb.}$$

If it is desired to determine what pressure a 3 lb. (standard air) blower will deliver at 6000 feet –

$$\text{Pressure} = 3 \times \frac{23.98}{29.92} = 2.4 \text{ or about } 2\ 1/2 \text{ lb.}$$

When a blower is to operate at a high altitude it is frequently specified that the blower be capable of handling a given volume of "standard air". It is then necessary to determine the equivalent volume of air at the higher altitude.
Example – A blower is to operate 6000 feet altitude and is to handle 1000 CFM of standard air. What is the CFM of air the blower must handle at 6000 feet altitude?

Let: V_1 = Volume of standard air (1000 CFM)
V_2 = Volume of thinner air
Hg_1 = Barometric pressure sea level (29.92)
Hg_2 = Barometric pressure 6000' (23.98)

$$V_2 = V_1 \times \frac{Hg_1}{Hg_2} = 1000 \times \frac{29.92}{23.98} = 1248 \text{ CFM}$$

The pressure changes as the *square* of the speed ratio.
Example – A blower is operating at a speed of 3500 RPM and delivering air at 5.0 pounds pressure. If the speed is reduced to 3000 RPM, what is the new pressure?

P_1 = Original Pressure (5 lbs.)
P_2 = New Pressure
RPM_1 = Original Speed (3500 RPM)
RPM_2 = New Speed (3000 RPM)

$$P_2 = P_1 \left(\frac{RPM_2}{RPM_1}\right)^2 = 5 \times \left(\frac{3000}{3500}\right)^2 = 5 \times .735 = 3.68 \text{ pounds}$$

Application Engineering Basics

The Air Density varies in inverse proportion to the absolute temperature.
Example – A blower is to handle 200°F air at 3 PSI pressure. What pressure (standard air) blower is required?

Let: P_1 = Pressure hot air (3 PSI)
P_2 = Pressure standard air
AT_1 = Absolute temperature hot air (200+460=660°F)
AT_2 = Absolute temperature standard air (68+460=528°F)

$$P_2 = P_1 \times \frac{AT_1}{AT_2} = 3 \times \frac{660}{528} = 3.75 \text{ or } 3\ 3/4 \text{ lb.}$$

A blower is capable of delivering 3 PSI pressure with standard air. What pressure will it develop handling 200°F inlet air?

$$P_1 = P_2 \times \frac{AT_2}{AT_1} = 3 \times \frac{528}{660} = 2.4 \text{ or about } 2\ 1/2 \text{ lb.}$$

Pressure varies in direct proportion to the density.
Example – A 3 lb. (standard air) blower is to be used to handle gas having a specific gravity of 0.5. What pressure does the blower create when handling the gas?

Let: Pa = Air pressure (3 lb.)
Pg = Gas pressure
SG = Specific gravity of gas (0.5)

Pg = Pa x SG = 3 x .5 = 1.5 lb.

If we are required to handle a gas having a specific gravity of 0.5 at 1.5 lb. pressure, we can determine the standard air pressure blower as follows:

$$\text{Let: Pa} = \frac{Pg}{SG} = \frac{1.5}{.5} = 3 \text{ lb.}$$

The following table gives the barometric pressure of various altitudes:
Absolute Pressure At Altitudes Above Sea Level (Based on U.S. Standard Atmosphere)

Altitude	Pressure		Altitude	Pressure		Altitude	Pressure	
Feet	In. Hg.	PSIA	Feet	In. Hg.	PSIA	Feet	In. Hg.	PSIA
0	29.92	14.70	2,500	27.31	13.41	7,000	23.09	11.34
500	29.38	14.43	3,000	26.81	13.19	7,500	22.65	11.12
600	29.28	14.38	3,500	26.32	12.92	8,000	22.22	10.90
700	29.18	14.33	4,000	25.84	12.70	8,500	21.80	10.70
800	29.07	14.28	4,500	25.36	12.45	9,000	21.38	10.50
900	28.97	14.23	5,000	24.89	12.23	9,500	20.98	10.90
1,000	28.86	14.18	5,500	24.43	12.00	10,000	20.58	10.10
1,500	28.33	13.90	6,000	23.98	11.77			
2,000	27.82	13.67	6,500	23.53	11.56			

Horsepower

The horsepower changes as the *cube* of the speed ratio.
Example – A blower is operating at a speed of 3500 RPM and requiring 50 horsepower. If the speed is reduced to 3000 RPM, what is the new required horsepower?

HP_1 = Original Horsepower (50)
HP_2 = New Horsepower
RPM_1 = Original Speed (3500 RPM)
RPM_2 = New Speed (3000 RPM)

$$HP_2 = HP_1 \times \left(\frac{RPM_2}{RPM_1}\right)^3 = 50 \times \left(\frac{3000}{3500}\right)^3 = 50 \times .630 = 31.5 \text{ horsepower}$$

The above is known as the 1-2-3 rule of blowers.

Horsepower vs. Specific Gravity & Ratio of density.
The horsepower varies in direct proportion to the specific gravity (ratio of density of gas to density of air).
Example – A standard air blower requires a 10 HP motor. What horsepower is required when this blower is to handle a gas whose specific gravity is 0.5?

HP = 10 x 0.5 = 5 horsepower

It is possible that several of the above modifications may be required on one installation. Therefore, it may be necessary to use various combinations of these formulae.

Application Engineering Basics

Orifice Flow Calculation

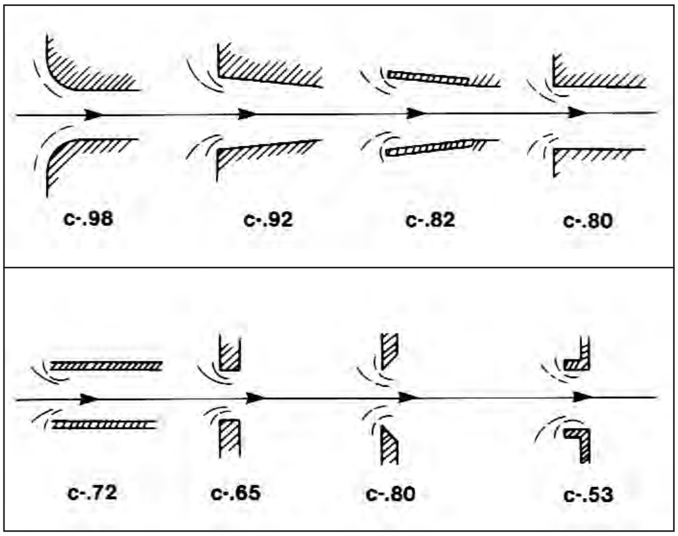
To determine air flow through an orifice:

$V = CK\sqrt{P}$ $Q = AV$ $VP = \left(\frac{V}{K}\right)^2$

Where:

- V = Velocity in feet per minute (fpm)
- C = Orifice Coefficient
- K = Constant = 14,786 when P is expressed in In. Hg
  21,094 when P is expressed in PSIG
  4,005 when P is expressed in In. of Water
  (Above constants are based on an air density of 0.075 lbs/ft^3)
- P = Pressure differential across the orifice
- Q = Flow rate in cubic feet per minute (CFM)
- A = Total orifice area expressed in square feet
- VP = Velocity pressure (units are those of pressure)

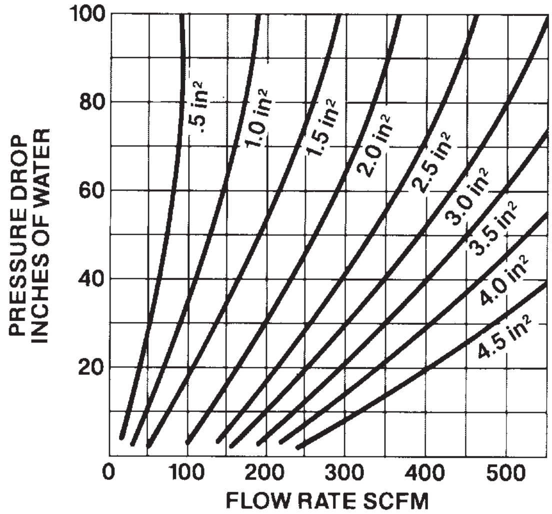
Coefficient C for Orifices Under Vacuum or Pressure Flow

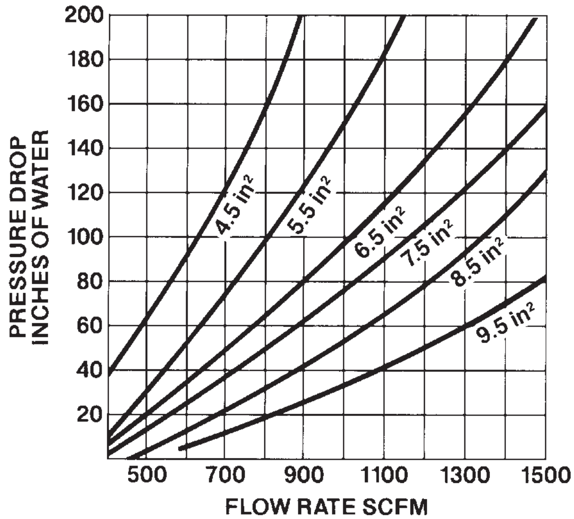


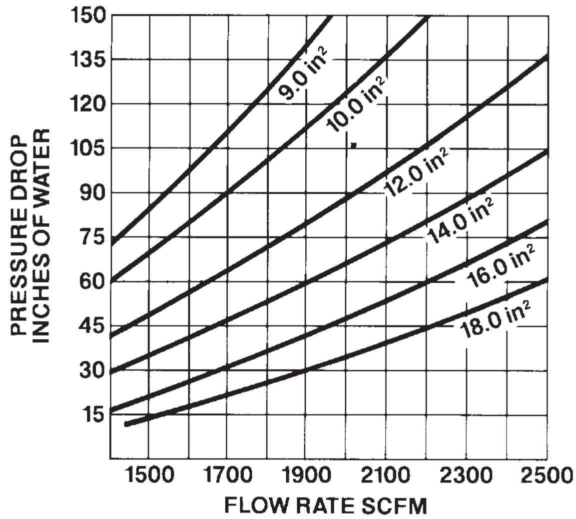
Area of Orifices Orifice Diameter in Inches		
Diameter in Inches	**Square Inches**	**Square Feet**
1/8	.01227	.000085
3/16	.02761	.00019
1/4	.04908	.00034
3/8	.11044	.00076
1/2	.19634	.00136
5/8	.30679	.00213
7/8	.60132	.00417
1.0	.78539	.00545

Orifice area (in sq. inches) = .25 X π X (orifice diameter in inches)^2
Orifice area (in sq. feet) = Area in sq. inches ÷ 144

ORIFICE PRESSURE DROP AS A FUNCTION OF FLOW AND ORIFICE AREA (C=.65)

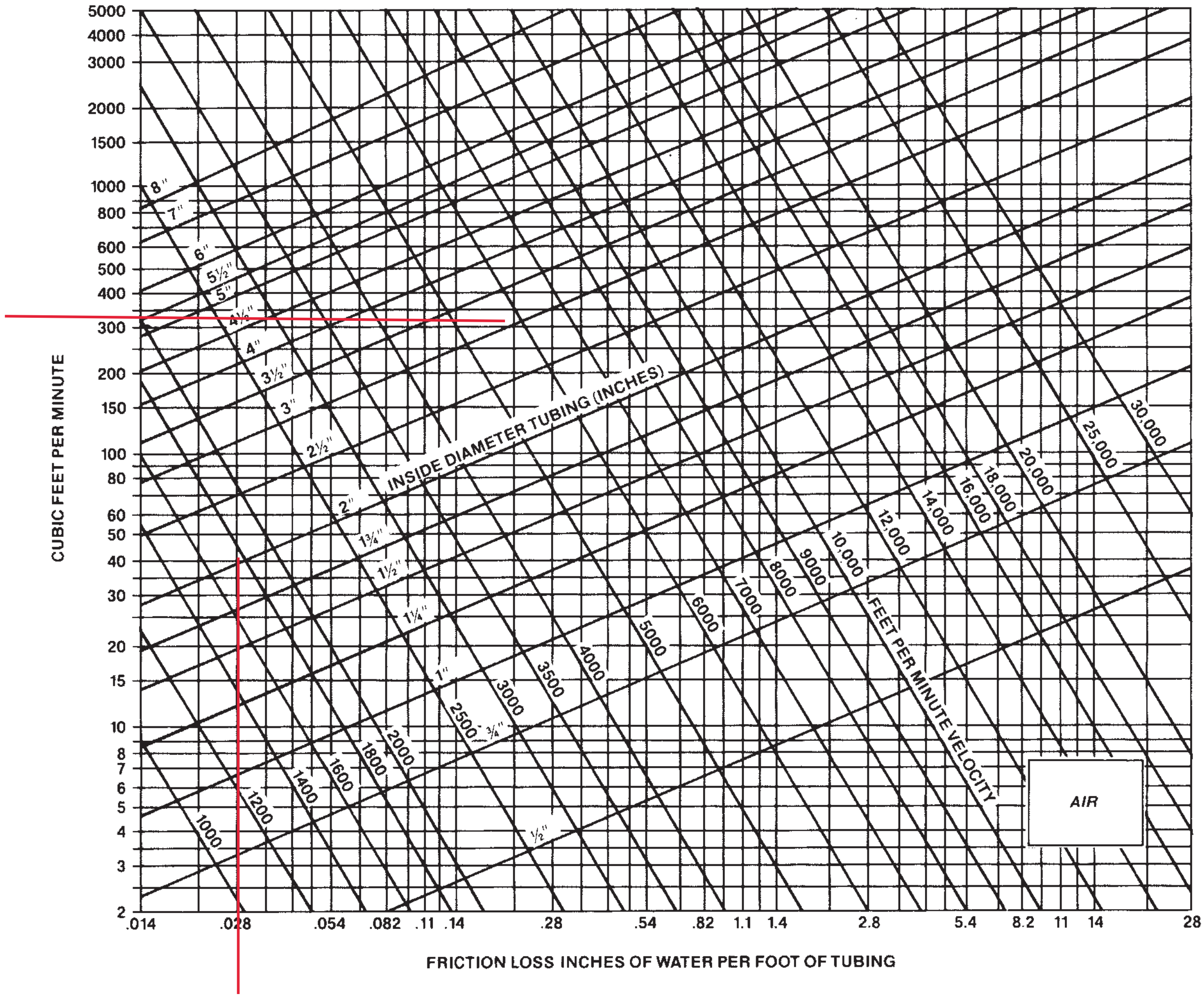






Application Engineering Basics

Friction Loss Per Foot of Tubing



Friction Loss in Fittings

To calculate friction loss in fittings use chart below. This chart will yield equivalent lengths (in feet) of tubing. Use this length with graph above to find friction loss in inches of water column.

NOMINAL PIPE SIZE (INCHES)	EQUIVALENT TUBING LENGTH (FEET)	
	90° EL	45° EL
1 1/4	3	1.5
1 1/2	4	2
2	5	2.5
2 1/2	6	3
3	7	4
4	10	5
5	12	6
6	15	7.5
8	20	10

Application Engineering Basics

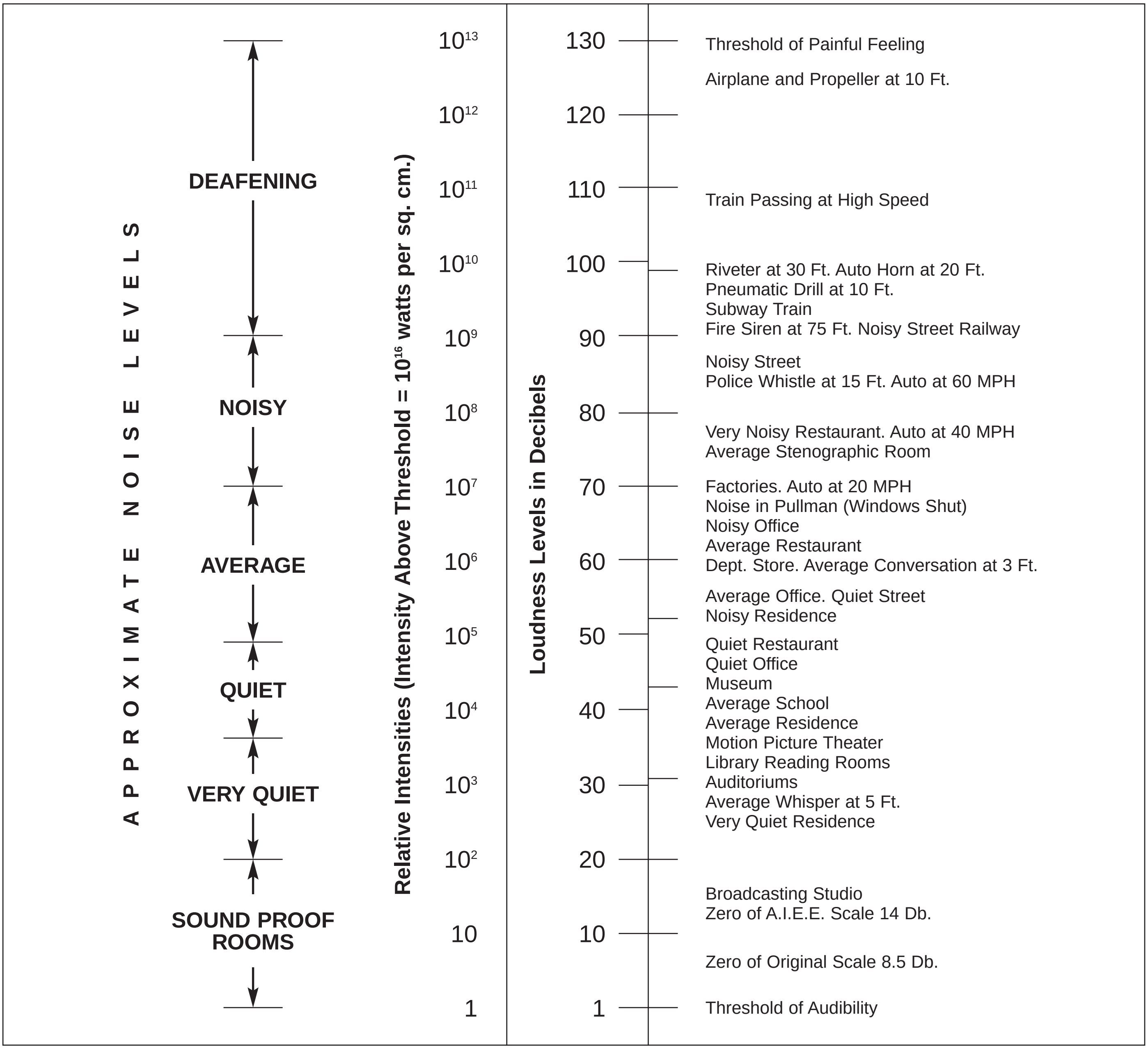
Noise Facts

- OSHA (Occupational Safety & Health Administration) regulates and monitors in-plant noise.
- Allowable noise is a function of dBA level at certain distance over an exposure time.
- OSHA regulations state 90 dBA for an 8 hour work period using slow responic setting on meter.
- Adding a second noise producer of equal dBA will add 3 dBA to the first dBA reading.
- Sound pressure level (SPL) decreases with distance (d)

  $(SPL)_2 = (SPL)_1 - 20LOG\left(\frac{d2}{d1}\right)$

  Therefore, each doubling of distance results in 6 dBA reduction.

Loudness Levels of Familiar Noises (Approximate Average Including Ear Network)



Application Engineering Basics

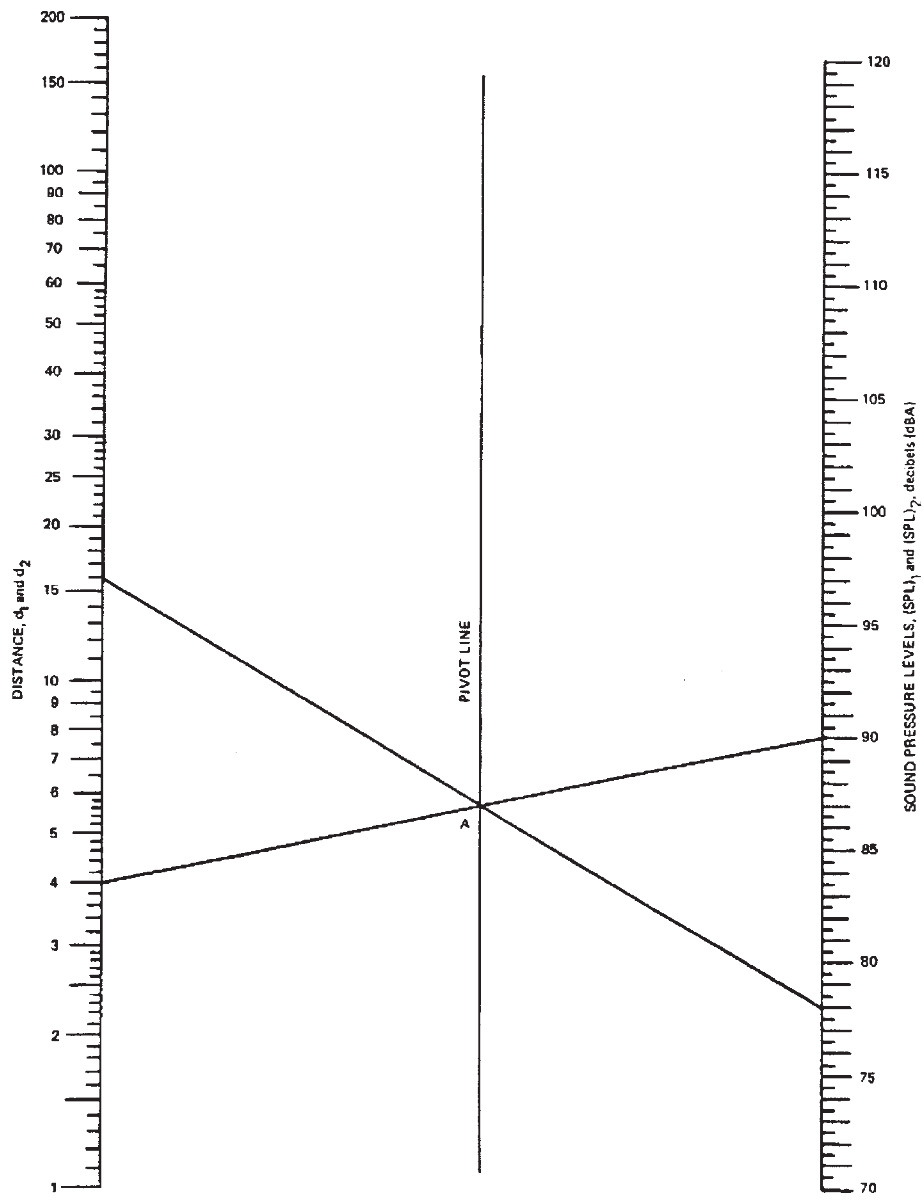
Industrial Blower Noise Chart* in dBA

* Average at 1 meter, 4 places around the blower

Model	Mode		Model	Mode		Model	Mode		Model	Mode		Model	Mode	
	Suction	Pressure		Suction	Pressure		Suction	Pressure		Suction	Pressure		Suction	Pressure
SE	60-62	60-62	101	65-67	66-68	513	80-81	80-81	707	83-85	84-86	S/P 9	90-91	90-91
MF	64-65	64-65	202M	67-69	68-70	505M	77-78	76-77	808	84-85	84-85	909	81-82	84-86
RDC	76-78	76-78	303M	65-67	67-69	523	82-83	82-83	623	81-82	81-82	1223	84-85	84-85
SL2	69-72	69-72	353M	72-73	73-74	555	80-81	80-81	S7	88-89	88-89	S/P 13	87-88	90-91
SL4	72-78	72-78	404M	73-74	74-75	656	82-83	82-83	858	84-85	84-85	14	86-87	86-87
SL5	76-79	76-79	454M	76-77	75-76	6	85-86	85-86	823	82-84	82-84	S/P 15	91-92	91-92

dBA at Distance Conversion Chart

To read, use straight edge to connect blower distance and dBA rating. A pivot point A will be developed. Use straight edge again with new distance and pivot point A to read dBA at new distance.



Friction Losses in Pipe Fittings
Resistance Coefficient K (use in formula $hf = Kv^2/2g$)

Fitting		LD	Nominal Pipe Size											
			½	¾	1	1¼	1½	2	2½-3	4	6	8-10	12-16	18-24
			K Value											
Angle Valve		55	1.48	1.38	1.27	1.21	1.16	1.05	0.99	0.94	0.83	0.77	0.72	0.66
Angle Valve		150	4.05	3.75	3.45	3.30	3.15	2.85	2.70	2.55	2.25	2.10	1.95	1.80
Ball Valve		3	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04
Butterfly Valve								0.86	0.81	0.77	0.68	0.63	0.35	0.30
Gate Valve		8	0.22	0.20	0.18	0.18	0.15	0.15	0.14	0.14	0.12	0.11	0.10	0.10
Globe Valve		340	9.2	8.5	7.8	7.5	7.1	6.5	6.1	5.8	5.1	4.8	4.4	4.1
Plug Valve Branch Flow		90	2.43	2.25	2.07	1.98	1.89	1.71	1.62	1.53	1.35	1.26	1.17	1.08
Plug Valve Straightaway		18	0.48	0.45	0.41	0.40	0.38	0.34	0.32	0.31	0.27	0.25	0.23	0.22
Plug Valve 3-Way Thru-Flow		30	0.81	0.75	0.69	0.66	0.63	0.57	0.54	0.51	0.45	0.42	0.39	0.36
Standard Elbow	90°	30	0.81	0.75	0.69	0.66	0.63	0.57	0.54	0.51	0.45	0.42	0.39	0.36
	45°	16	0.43	0.40	0.37	0.35	0.34	0.30	0.29	0.27	0.24	0.22	0.21	0.19
	long radius 90°	16	0.43	0.40	0.37	0.35	0.34	0.30	0.29	0.27	0.24	0.22	0.21	0.19
Close Return Bend		50	1.35	1.25	1.15	1.10	1.05	0.95	0.90	0.85	0.75	0.70	0.65	0.60
Standard Tee	Thru-Flow	20	0.54	0.50	0.46	0.44	0.42	0.38	0.36	0.34	0.30	0.28	0.26	0.24
	Thru-	60	1.62	1.50	1.38	1.32	1.26	1.14	1.08	1.02	0.90	0.84	0.78	0.72
90 Bends, Pipe Bends, Flanged Elbows, Butt-Welded Elbows	r/d=1	20	0.54	0.50	0.46	0.44	0.42	0.38	0.36	0.34	0.30	0.28	0.26	0.24
	r/d=2	12	0.32	0.30	0.28	0.26	0.25	0.23	0.22	0.20	0.18	0.17	0.16	0.14
	r/d=3	12	0.32	0.30	0.28	0.26	0.25	0.23	0.22	0.20	0.18	0.17	0.16	0.14
	r/d=4	14	0.38	0.35	0.32	0.31	0.29	0.27	0.25	0.24	0.21	0.20	0.18	0.17
	r/d=6	17	0.46	0.43	0.39	0.37	0.36	0.32	0.31	0.29	0.26	0.24	0.22	0.20
	r/d=8	24	0.65	0.60	0.55	0.53	0.50	0.46	0.43	0.41	0.36	0.34	0.31	0.29
	r/d=10	30	0.81	0.75	0.69	0.66	0.63	0.57	0.54	0.51	0.45	0.42	0.39	0.36
	r/d=12	34	0.92	0.85	0.78	0.75	0.71	0.65	0.61	0.58	0.51	0.48	0.44	0.41
	r/d=14	38	1.03	0.95	0.87	0.84	0.80	0.72	0.68	0.65	0.57	0.53	0.49	0.46
	r/d=16	42	1.13	1.05	0.97	0.92	0.88	0.80	0.76	0.71	0.63	0.59	0.55	0.50
	r/d=18	45	1.24	1.15	1.06	1.01	0.97	0.87	0.83	0.78	0.69	0.64	0.60	0.55

Mitre Bends	a=0°	2	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.02
	a=15°	4	0.11	0.10	0.09	0.09	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05
	a=30°	8	0.22	0.20	0.18	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.10	0.10
	a=45°	15	0.41	0.38	0.35	0.33	0.32	0.29	0.27	0.26	0.23	0.21	0.20	0.18
	a=60°	25	0.68	0.63	0.58	0.55	0.53	0.48	0.45	0.43	0.38	0.35	0.33	0.30
	a=75°	40	1.09	1.00	0.92	0.88	0.84	0.76	0.72	0.68	0.60	0.56	0.52	0.48
	a=90°	60	1.62	1.50	1.38	1.32	1.26	1.14	1.08	1.02	0.90	0.84	0.78	0.72
Note: Fittings are standard with full openings.														

Fitting	L/D	Minimum Velocity for Full Disc Lift		Nominal Pipe Size											
				½	¾	1	1¼	1½	2	2½-3	4	6	8-10	12-16	18-24
		General ft/sec	Water ft/sec	K Value											
Swing Check Valve	100	$35\sqrt{\bar{v}}$	4.40	2.70	2.50	2.30	2.20	2.10	1.90	1.80	1.70	1.50	1.40	1.30	1.20
	50	$48\sqrt{\bar{v}}$	6.06	1.40	1.30	1.20	1.10	1.10	1.00	0.90	0.90	0.75	0.70	0.65	0.60
Lift Check Valve	600	$40\sqrt{\bar{v}}$	5.06	16.2	15.0	13.08	13.2	12.6	11.4	10.8	10.2	9.0	8.4	7.8	7.2
	55	$140\sqrt{\bar{v}}$	17.7	1.50	1.40	1.30	1.20	1.20	1.10	1.00	0.94	0.83	0.77	0.72	0.66
Tilting Disc Check Valve	5	$80\sqrt{\bar{v}}$	10.13						0.76	0.72	0.68	0.60	0.56	0.39	0.24
	15	$30\sqrt{\bar{v}}$	3.80						2.30	2.20	2.00	1.80	1.70	1.20	0.72
Foot Valve with Strainer Poppet Disc	420	$15\sqrt{\bar{v}}$	1.90	11.3	10.5	9.70	9.30	8.80	8.00	7.60	7.10	6.30	5.90	5.50	5.0
Foot Valve with Strainer Hinged Disc	75	$35\sqrt{\bar{v}}$	4.43	2.00	1.90	1.70	1.70	1.70	1.40	1.40	1.30	1.10	1.10	1.00	0.90

Fitting	Description	All Pipe Sizes
		K Value
Pipe Exit	Projecting Sharp-Edged Rounded	1.00

Pipe Entrance	Inward Projecting	0.78
Pipe Entrance Flush	Sharp-Edged	0.50
	r/d=0.02	0.28
	r/d=0.04	0.24
	r/d=0.06	0.15
	r/d=0.10	0.09
	r/d<0.14	0.04

The K values given below are for making estimates of friction loss in cases not covered in the previous tables.

Type of Fitting	K Value
Disk or Wobble Meter	3.4 - 10
Rotary Meter (Star or Cog-Wheel Piston)	10
Reciprocating Piston Meter	15
Turbine Wheel (Double-Flow) Meter	5 - 7.5
Bends w/Corrugated Inner Radius	1.3 - 1.6 times value for smooth bend

Example: Determine L (friction loss in pipe fittings in terms of equivalent length in feet of straight pipe).
Assume a 6" angle valve for Schedule 40 pipe size.
Select the appropriate K value for such and select D and f for Schedule 40 pipe from the table below where K is the pipe diameter in feet.

Pipe Size Inches Sch. 40	D feet	f	Pipe Size Inches Sch. 40	D feet	f	Pipe Size Inches Sch. 40	D feet	f	Pipe Size Inches Sch. 40	D feet	f
½	0.0518	0.027	2½	0.2058	0.018	10	0.8350	0.014	24	1.8857	0.012
¾	0.0687	0.025	3	0.2557	0.018	12	0.9948	0.013	30	2.3333	0.011
1	0.0874	0.023	4	0.3355	0.017	14	1.0937	0.013	36	2.8333	0.011
1¼	0.1150	0.022	5	0.4206	0.016	16	1.250	0.013	42	3.3333	0.010
1½	0.1342	0.021	6	0.5054	0.015	18	1.4063	0.012	48	3.8333	0.010
2	0.1723	0.019	8	0.6651	0.014	20	1.5678	0.012			

Friction Loss of Water in Pipe Fittings in Terms of Equivalent Length - Feet of Straight Pipe

Nominal pipe size	Actual inside diameter inches d	Friction factor f	Gate valve - full open	90° elbow	Long radius 90° or 45° std elbow	Std tee - thru flow	Std tee - branch flow	Close return bend	Swing check valve - full open	Angle valve - full open	Globe valve - full valve	Butter-fly valve	90°Welding elbow r/d =	90°Welding elbow r/d =	Mitre bend 45°	Mitre bend 90°
½	.622	.027	.41	1.55	.83	1.04	3.11	2.59	5.18	7.78	17.6					
¾	.824	.025	.55	2.06	1.10	1.37	4.12	3.43	6.86	10.3	23.3					
1	1.049	.023	.70	2.62	1.40	1.75	5.25	4.37	8.74	13.1	29.7					
1¼	1.380	.022	.92	3.45	1.84	2.30	6.90	5.75	11.5	17.3	39.1					
1½	1.610	.021	1.07	4.03	2.15	2.68	8.05	6.71	13.4	20.1	45.6					
2	2.067	.019	1.38	5.17	2.76	3.45	10.3	8.61	17.2	25.8	58.6	7.75	3.45	2.07	2.58	10.3
2½	2.469	.018	1.65	6.17	3.29	4.12	12.3	10.3	20.6	30.9	70.0	9.26	4.12	2.47	3.08	12.3
3	3.068	.018	2.04	7.67	4.09	5.11	15.3	12.8	25.5	38.4	86.9	11.5	5.11	3.07	3.84	15.3
4	4.026	.017	2.68	10.1	5.37	6.71	20.1	16.8	33.6	50.3	114	15.1	6.71	4.03	5.03	20.1
5	5.047	.016	3.36	12.6	6.73	8.41	25.2	21.0	42.1	63.1	143	18.9	8.41	5.05	6.31	25.2
6	6.065	.015	4.04	15.2	8.09	10.1	30.3	25.3	50.5	75.8	172	22.7	10.1	6.07	7.58	30.3
8	7.981	.014	5.32	20.0	10.6	13.3	39.9	33.3	33.3	99.8	226	29.9	13.3	7.98	9.98	39.9
10	10.02	.014	6.68	25.1	13.4	16.7	50.1	41.8	41.8	125	284	29.2	16.7	10.0	12.5	50.1
12	11.938	.013	7.96	29.8	15.9	19.9	59.7	49.7	49.7	149	338	34.8	19.9	11.9	14.9	59.7
14	13.124	.013	8.75	32.8	17.5	21.8	65.6	54.7	54.7	164	372	38.3	21.8	13.1	16.4	65.6
16	15.00	.013	10.0	37.5	20.0	25.0	75.0	62.5	62.5	188	425	31.3	25.0	15.0	18.8	75.0
18	16.876	.012	16.9	42.2	22.5	28.1	84.4	70.3	70.3	210	478	35.2	28.1	16.9	21.1	84.4
20	18.814	.012	12.5	47.0	25.1	31.4	94.1	78.4	78.4	235	533	39.2	31.4	18.8	23.5	94.1
24	22.628	0.12	15.1	56.6	30.2	37.7	113	94.3	94.3	283	641	47.1	37.7	22.6	28.3	113
30	28	.011	18.7	70	37.3	46.7	140	117					46.7	28	35	140
36	34	.011	22.7	85	45.3	56.7	170	142					56.7	34	43	170
42	40	.010	26.7	100	53.3	66.7	200	167					66.7	40	50	200
48	46	.010	30.7	115	61.3	76.7	230	192					76.7	46	58	230
L/D			8	30	16	20	60	50	½ to 6 = 100 24 to 48 =50	150	340		20	12	15	60

INFILTRATION GALLERY DESIGN

Select gallery dimensions of:	10	ft, length (L)
	3	ft, width (W)
	3	ft, depth

Discharge rate (avg) = 0.5 gal/min = 96.3 ft^3/day
(avg. flow rate of discharge)

Gallery recharge rate = Discharge rate / (L*W) *= **4.81 ft/day**

Infiltration rate = **19.2 ft/day**

Based on the USDA data for Sparr fine sand, bouldery subsurface, 0 to 5 percent slopes; 68 micrometers per second

GALLERY RECHARGE RATE < INFILTRATION RATE

4.8 ft/day < 19.2 ft/day OK

pdblowers inc

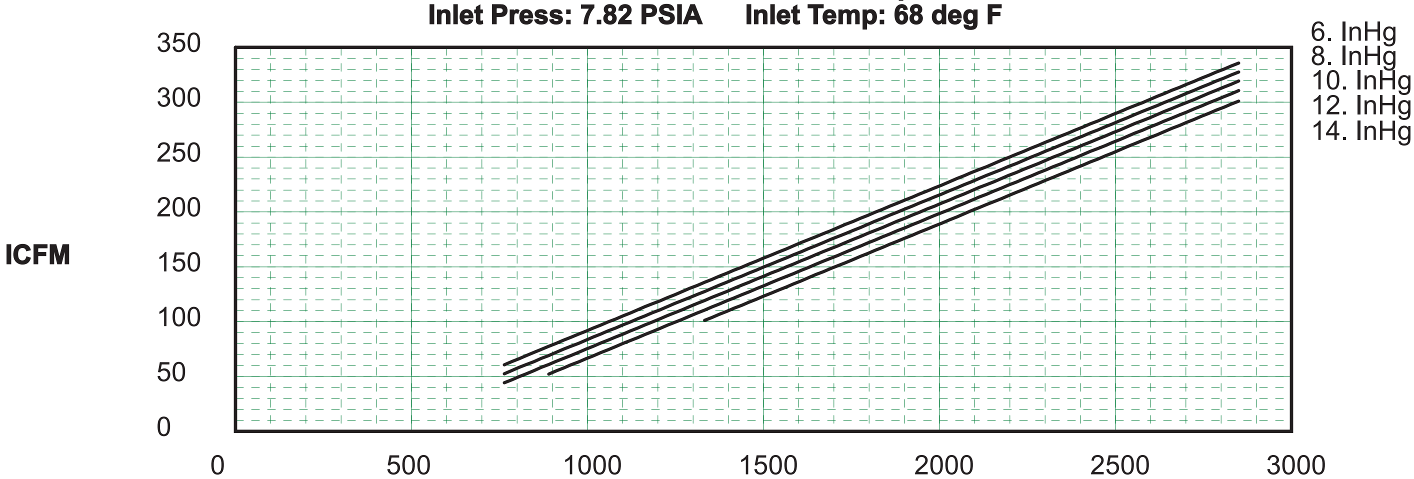
Blower Performance Curves

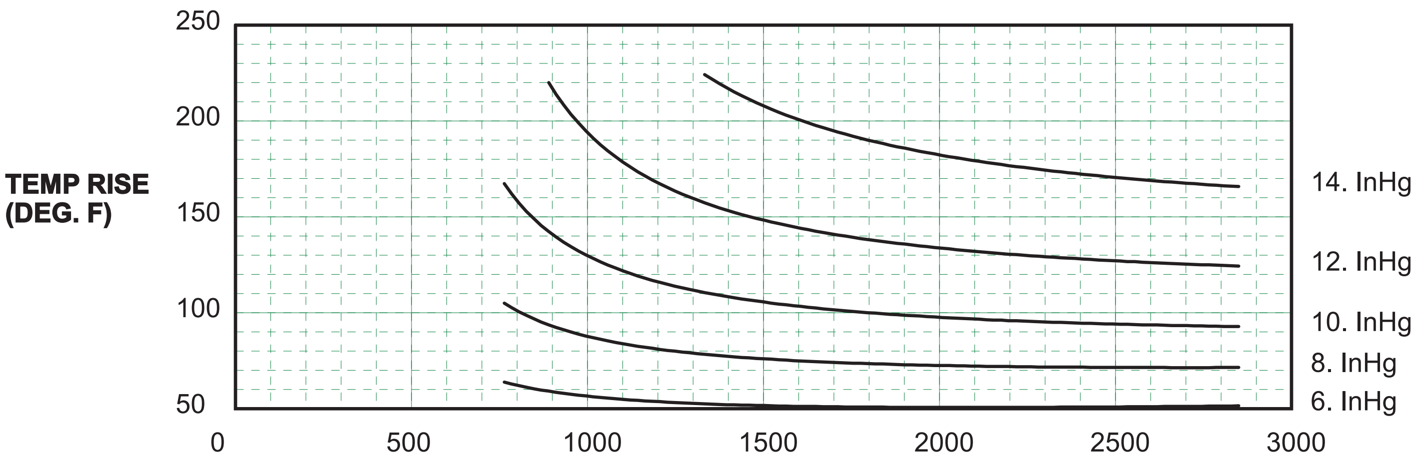
PDAnalysis 2013 Version 4.20

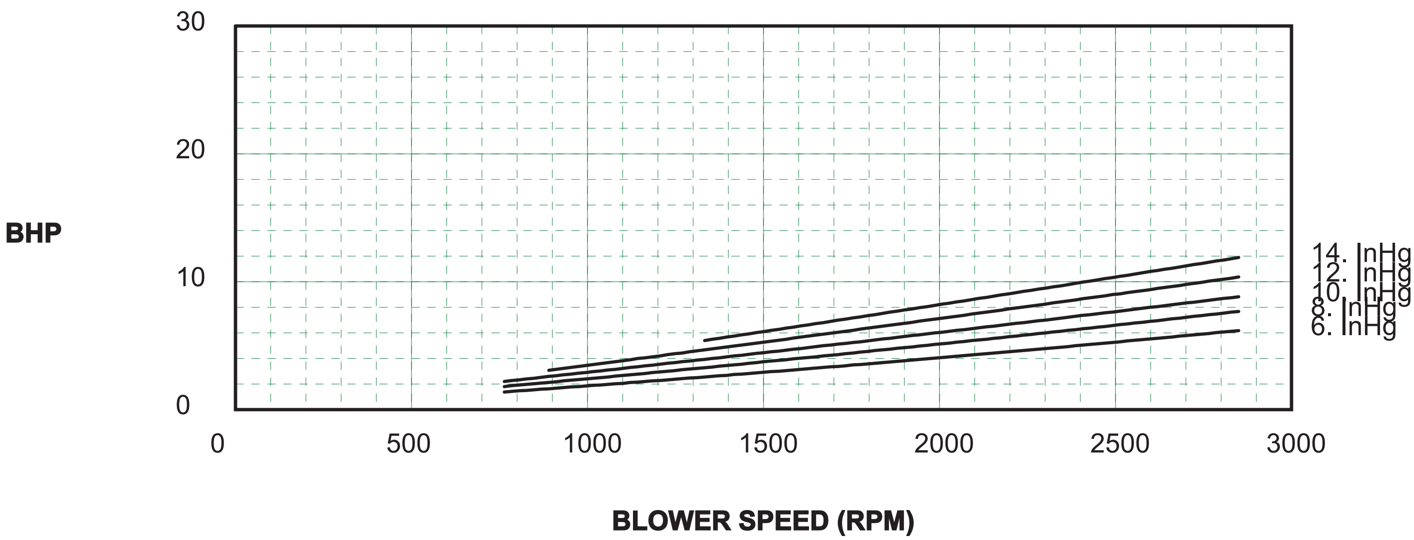
Saturday, May 20, 2017

Vacuum Performance
Roots Model 53 URAI

Maximum Vacuum: 16IN. HG **Maximum Speed: 2850 RPM**
Inlet Press: 7.82 PSIA **Inlet Temp: 68 deg F**







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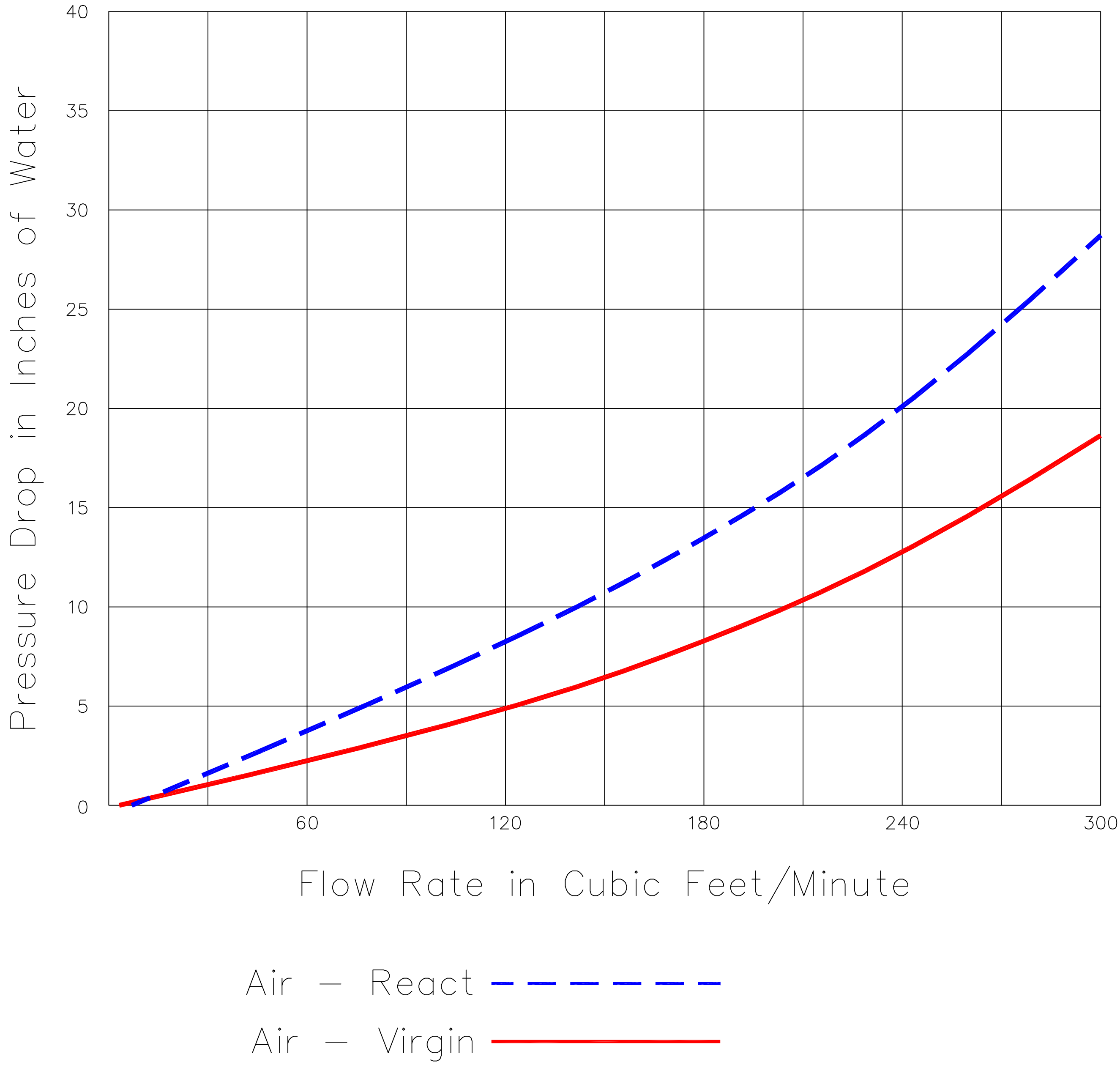
AIR 150 4" Top In Top Out Pressure Drop Curve



Customer: Customer's job: Drawn by	
Scale	
PDC–AIR 150 4" TT	

Ingersoll Rand 7.5-HP 80-Gallon Rotary Screw Air Compressor

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- More air for less horsepower reducing yearly energy cost

Smart Energy Controls

- Eliminate running unloaded by cycling the compressor on/off

Whisper Quiet Operation

- Allows for installation closer to point-of-use
- Sound levels as low as 68dBa

Compact Footprint Design

- Frees up valuable floor space and reduces install costs

Fewer Connections

- Eliminates leaks and pressures drops maximizing reliability

Simple Diagnostics

- Displays operating status and run hours reducing downtime

Poly-V Belt Drive

- Drive system eliminates belt stretch and increases air output

High-Efficiency Filter

- Clean air quality to run tools and equipment long term

Pump

CFM	28
CFM Rated @	125 PSI
Pump Type	Rotary
Max PSI	125 PSI
After Cooler	Yes
Pump Drive	Belt Drive
Oil Type	Oil Lubricated
Duty Cycle	100%

Tank

Tank Size	80 Gallons
Tank Outlet	3/4 Inch
Electronic Drain Valve	No
Tank Orientation	Horizontal

Accessories

Air Dryer	No
Air Filter	Yes

Overview

Certification	ASME
Weight	925 Pounds
Product Length	54 Inches
Product Width	29 Inches
Product Height	61 Inches
Consumer Warranty	1 Year
Commercial Warranty	1 Year
Power Type	Electric
UPC	678384030953

APPENDIX C

SYSTEM SAMPLING SCHEDULE

System/ Samples			Day 1	Day 2	Day 3	Week 2	Week 3	Week 4	Month 2	Month 3
AS/SVE	Air (TO-18)	Influent	x	x	x	x	x	x	x	x
		Effluent	x	x	x	x	x	x	x	x
		Mid			x	x	x	x	x	x
		Ambient in the store	x		x	x	x	x	x	x
SVE*	Effluent water (8260, 8270, TRPH)	effluent before carbon	x		x	x	x	x	x	x
		effluent after carbon	x		x	x	x	x	x	x

*Effluent water samples will be collected based on water accumulation (may not be collected if no water accumulated).

Monitoring Wells/Period	Y1Q1	Y1Q2	Y1Q3	Y1Q4	Y2Q1	Y2Q2	Y2Q3	Y2Q4
OB-1, OB-2, MW-12, MW-8R, MW-8I, MW-5R, MW-5I, MW-21D (proposed)	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs	8260 BTEX/MTBE, 8270 PAHs

MILESTONE SCHEDULE

Facility Name	AA Discount
Facility ID #	60/8516863

Baseline Sampling Date	6/22/2017
System Startup Date	

Baseline Constituent Concentrations (ug/l)

Contaminant Group Per March 1, 2004 RAI		Group 1	Group 2				Group 3				Group 4	Group 5	Group 6	Group 7
Milestone Well #	Monitoring Wells	Benzene	Toluene	Ethyl-benzene	Xylenes	Sum TEX	Naph-thalene	1-Methyl Naph.	2-Methyl Naph.	Sum Naphs	MTBE	TRPH	PAH (I)[1]	PAH (II)[2]
First Well	MW-5R	0.17	0.14	0.22	0.5	0.86	0.02	0.02	0.02	0.06	1.8			
Second Well	MW-5I	0.4	0.4	0.4	0.8	1.6	0.168	0.1	0.1	0.368	32.6			
Third Well	MW-8R	23.7	47.6	36.8	61	145.4	4.5	1.6	0.54	6.64	2.4			
Fourth Well	MW-8I	5.05	0.4	0.83	0.8	2.03	0.047	0.047	0.047	0.141	3.86			
Fifth Well						0				0				
Sixth Well						0				0				

Defined Cleanup Target Levels (ug/l)

Contaminant Group Per March 1, 2004 RAI		Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Cleanup Target		Benzene	Sum: Toluene, Ethylbenzene, Total Xylenes	Sum: Naphthalenes	MTBE	TRPH	PAH (I)[1]	PAH (II)[2]
Groundwater Cleanup Target Level (ug/l)		1	90	70	20	5000		
Natural Attenuation Default Conc. (ug/l)		100	900	700	200	50000		
70% Natural Attenuation Default Conc. (ug/l)		70	630	490	140	35000		
90% Baseline Reduction (ug/l)								
First Well	MW-5R	0	0	0	0	0	0	0
Second Well	MW-5I	0	0	0	3	0	0	0
Third Well	MW-8R	2	15	1	0	0	0	0
Fourth Well	MW-8I	1	0	0	0	0	0	0
Fifth Well	0	0	0	0	0	0	0	0
Sixth Well	0	0	0	0	0	0	0	0

Selected Active Remediation Goal

Groundwater Cleanup Target Level (ug/l)

Estimated Active Remediation Time	0.5 years

Milestones are based on pre-startup baseline sampling per Section C.2 of the March 1, 2004 FDEP RAI.

Groundwater Cleanup Target Levels and Natural Attenuation Default Concentrations (NADC) as established in Chapter 62-777, F.A.C.

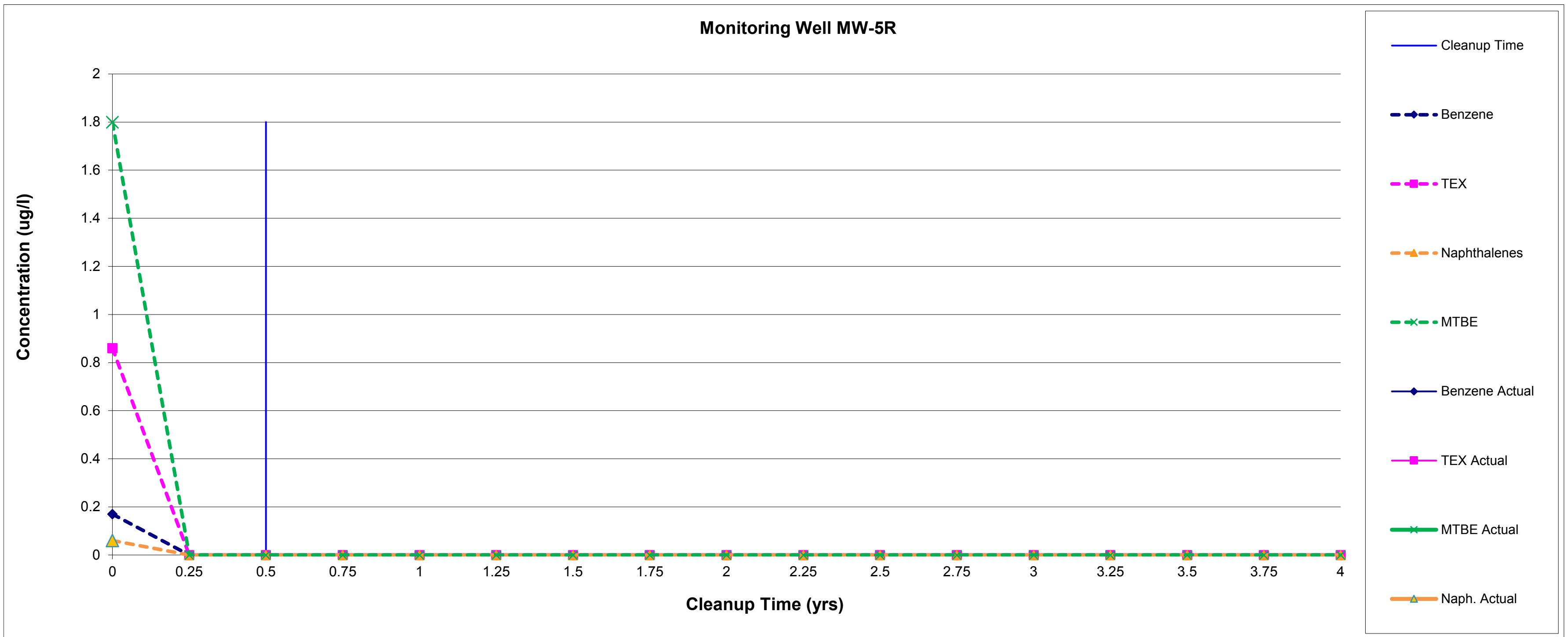
[1]Sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)flouranthene, Benzo(k)flouranthene, Dibenz(a,h)anthracene, Chrysene, and Indeno(1,2,3-cd)pyrene.

[2]Sum of other PAH's not included in Group 3 or Group 6

Monitoring Well MW-5R	Facility Name	AA Discount		Baseline Sampling Date	6/22/2017
	Facility ID #	60/8516863		System Startup Date	1/0/1900

Constituent Concentration Group Milestones (ug/l)

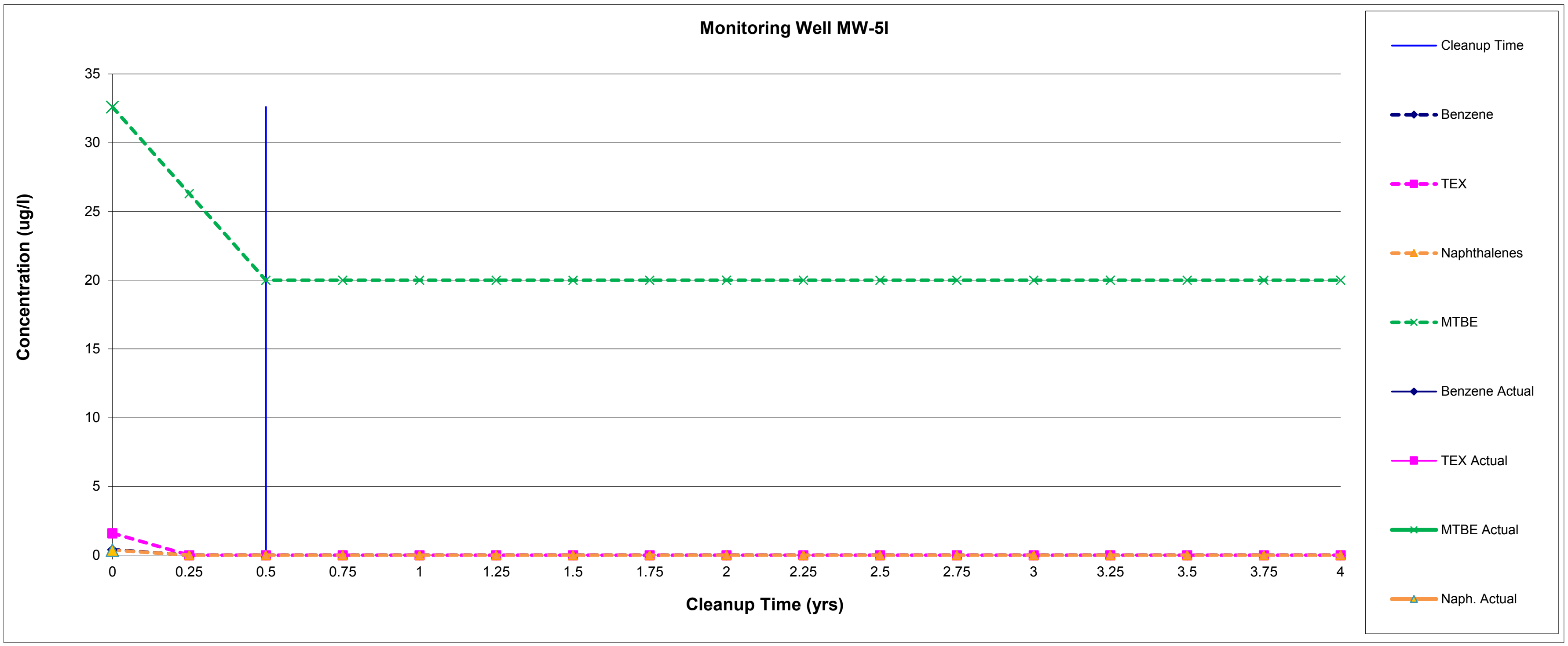
Projected Cleanup Time (yrs)	Actual Sampling Date	Actual Cleanup Time (yrs)	Group 1 Benzene		Group 2 Sum Toluene, Ethylbenzene, & Xylenes		Group 3 Naphthalenes		Group 4 MTBE		Group 5 TRPH		Group 6 PAH (I)		Group 7 PAH (II)	
			Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual
0.00	6/22/2017	0.00	0	0.17	1	0.86	0	0.06	2	1.8	NA	NA	NA	NA	NA	NA
0.25																
0.50																
0.75																
1.00																
1.25																
1.50																
1.75																
2.00																
2.25																
2.50																
2.75																
3.00																
3.25																
3.50																
3.75																
4.00																
Remediation Goal (ug/l)			1		90		70		20		5000		0		0	



Monitoring Well MW-5I	Facility Name	AA Discount	Baseline Sampling Date	6/22/2017
	Facility ID #	60/8516863	System Startup Date	1/0/1900

Constituent Concentration Group Milestones (ug/l)

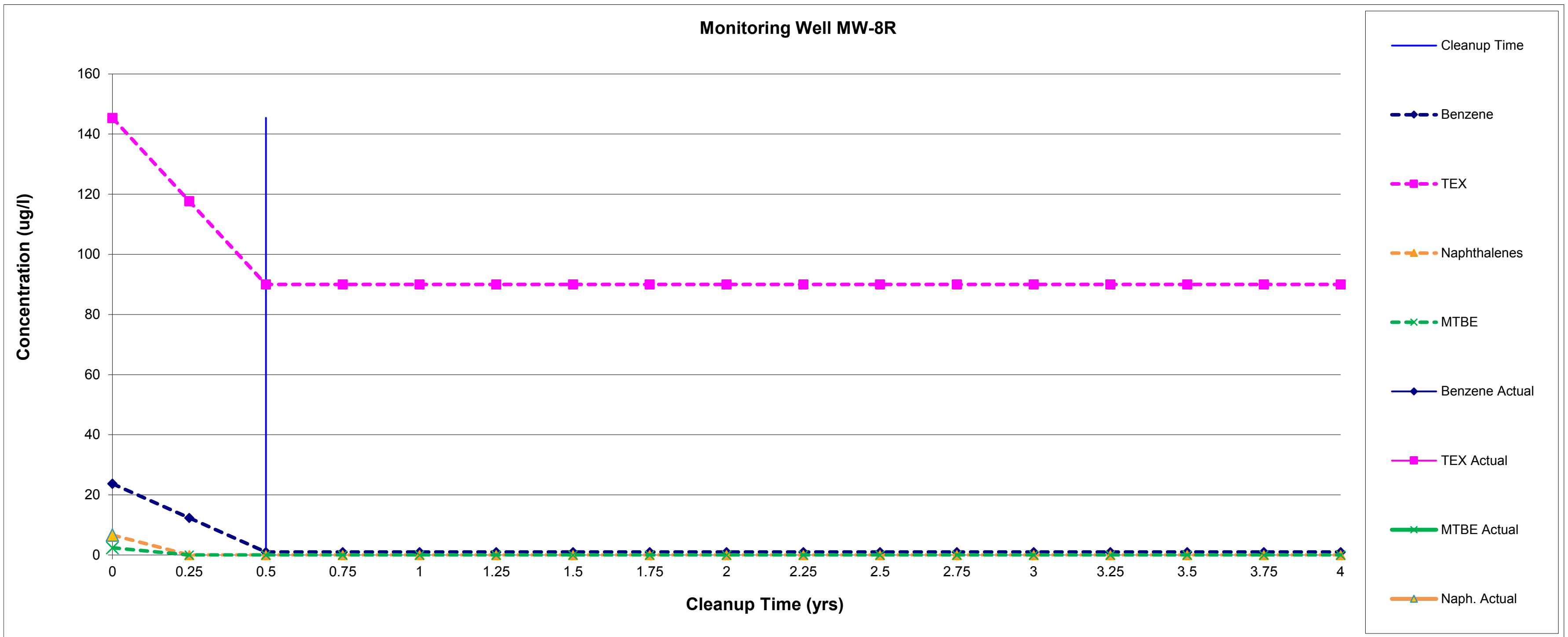
Projected Cleanup Time (yrs)	Actual Sampling Date	Actual Cleanup Time (yrs)	Group 1 Benzene Proj.	Group 1 Benzene Actual	Group 2 Sum Toluene, Ethylbenzene, & Xylenes Proj.	Group 2 Actual	Group 3 Naphthalenes Proj.	Group 3 Actual	Group 4 MTBE Proj.	Group 4 Actual	Group 5 TRPH Proj.	Group 5 Actual	Group 6 PAH (I) Proj.	Group 6 Actual	Group 7 PAH (II) Proj.	Group 7 Actual
0.00	6/22/2017	0.00	0	0.4	2	1.6	0	0.368	33	32.6	NA	NA	NA	NA	NA	NA
0.25									26							
0.50									20							
0.75									20							
1.00									20							
1.25									20							
1.50									20							
1.75									20							
2.00									20							
2.25									20							
2.50									20							
2.75									20							
3.00									20							
3.25									20							
3.50									20							
3.75									20							
4.00									20							
Remediation Goal (ug/l)			1		90		70		20		5000		0		0	



Monitoring Well MW-8R	Facility Name	AA Discount	Baseline Sampling Date	6/22/2017
	Facility ID #	60/8516863	System Startup Date	1/0/1900

Constituent Concentration Group Milestones (ug/l)

Projected Cleanup Time (yrs)	Actual Sampling Date	Actual Cleanup Time (yrs)	Group 1 Benzene		Group 2 Sum Toluene, Ethylbenzene, & Xylenes		Group 3 Naphthalenes		Group 4 MTBE		Group 5 TRPH		Group 6 PAH (I)		Group 7 PAH (II)	
			Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual	Proj.	Actual
0.00	6/22/2017	0.00	24	23.7	145	145.4	7	6.64	2	2.4	NA	NA	NA	NA	NA	NA
0.25			12		118											
0.50			1		90											
0.75			1		90											
1.00			1		90											
1.25			1		90											
1.50			1		90											
1.75			1		90											
2.00			1		90											
2.25			1		90											
2.50			1		90											
2.75			1		90											
3.00			1		90											
3.25			1		90											
3.50			1		90											
3.75			1		90											
4.00			1		90											
Remediation Goal (ug/l)			1		90		70		20		5000		0		0	

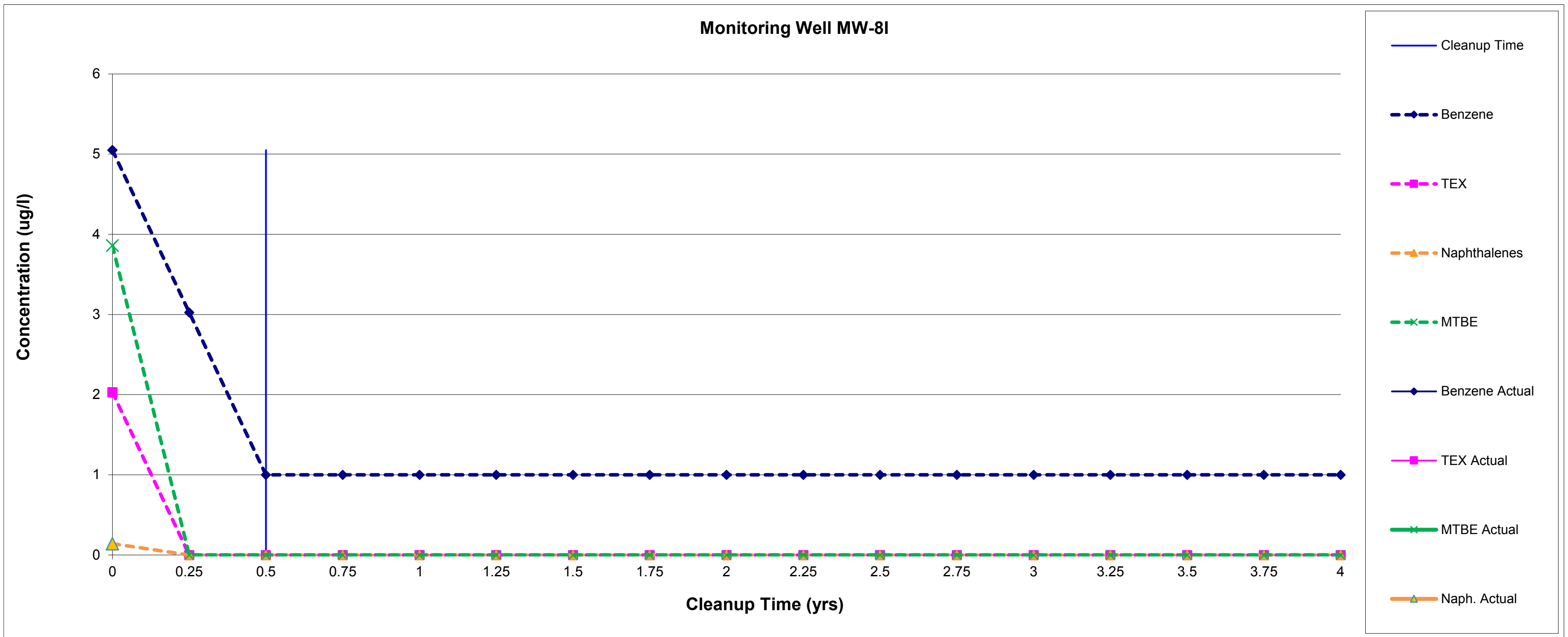


Monitoring Well MW-8I	Facility Name	AA Discount
	Facility ID #	60/8516863

Baseline Sampling Date	6/22/2017
System Startup Date	1/0/1900

Constituent Concentration Group Milestones (ug/l)

Projected Cleanup Time (yrs)	Actual Sampling Date	Actual Cleanup Time (yrs)	Group 1 Benzene Proj.	Group 1 Benzene Actual	Group 2 Sum Toluene, Ethylbenzene, & Xylenes Proj.	Group 2 Actual	Group 3 Naphthalenes Proj.	Group 3 Actual	Group 4 MTBE Proj.	Group 4 Actual	Group 5 TRPH Proj.	Group 5 Actual	Group 6 PAH (I) Proj.	Group 6 Actual	Group 7 PAH (II) Proj.	Group 7 Actual
0.00	6/22/2017	0.00	5	5.05	2	2.03	0	0.141	4	3.86	NA	NA	NA	NA	NA	NA
0.25			3													
0.50			1													
0.75			1													
1.00			1													
1.25			1													
1.50			1													
1.75			1													
2.00			1													
2.25			1													
2.50			1													
2.75			1													
3.00			1													
3.25			1													
3.50			1													
3.75			1													
4.00			1													
Remediation Goal (ug/l)			1		90		70		20		5000		0		0	



APPENDIX D

DEP Form # 62-785.900(4)
Form Title: Remedial Action Plan Summary
Effective Date: July 6, 1998

Remedial Action Plan Summary

Site Name AA Discount
Location 181 West Kings HWY, Center Hill, Sumter County, FL

FDEP BF Site ID No. 60/8516863
Current Date 04/25/2018
Date of Last GW Analysis 06/23/2017

CHECK ALL THAT APPLY:

Media Contaminated: ☑ Groundwater ☐ Sediment ☐ Soil ☐ Air

Type(s) of Product(s) Discharged:

☑ Gasoline / Kerosene Analytical Group
☐ Listed Hazardous Waste
☐ Other types of contaminants (solvents, etc.)
List: ____

Plume Characteristics:

- Estimated Mass (lbs):
  Groundwater 1 Soil ____
- Area of Plume 900 (ft^2)
- Depth of Plume 10 (ft)

Groundwater Recovery and Specifications:

- No. of Recovery Wells ____
  ☐ Vertical ☐ Horizontal
- Design Flow Rate/Well ____ (gpm)
- Total Flow Rate ____ (gpm)
- Hydraulic Conductivity ____ (ft/day)
- Recovery Well Screen Interval ____ (ft)
- Depth to Water ____ (ft)

Method of Groundwater Remediation:

☐ Pump-and-Treat:
  ☐ Air Stripper
    ☐ Low Profile ☐ Packed Tower
  ☐ Diffused Aerator
  ☐ Activated Carbon
    ☐ Primary Treatment ☐ Polishing

☑ In Situ Air Sparging - Pressure: 26.0000000000 (psi)
- No. of Sparge Points 13
  ☑ Vertical ☐ Horizontal
- Design Air Flow Rate/Well 2.0000000000 (cfm)
- Total Air Flow Rate 26.0000000000 (cfm)

☐ Biosparging:
- No. of Sparge Points ____
  ☐ Vertical ☐ Horizontal
- Design Air Flow Rate/Well ____ (cfm)

☐ Bioremediation:
  ☐ In Situ ☐ Ex Situ

☐ Other ____

Free Product Present: ☐ Yes ☑ No
- Estimated Volume ____ (gal)
- Maximum Thickness ____ (in)
- Method of Recovery (check all that apply):

Method of Groundwater Disposal:

☑ Infiltration Gallery ☐ Sanitary Sewer
☐ Surface Discharge/NPDES ☐ Injection Well
☐ Other ____

Method of Soil Remediation:

☐ Excavation:
  Volume to be excavated ____ (yds^3)
  ☐ Thermal Treatment ☐ Land Farming On Site
  ☐ Landfill ☐ Bioremediation
  ☐ Other ____

☑ Vapor Extraction System (VES):
- No. of Venting Wells 6
  ☑ Vertical ☐ Horizontal
- VES - Applied Vacuum 75.0000000000 (wg)
- Design Air Flow Rate 20.0000000000 (cfm)
- Design Radius of Influence 10.0000000000 (ft)
- Air Emissions Treatment
  ☐ Thermal Oxidizer ☐ Catalytic Converter
  ☑ Carbon ☐ Other ____

☐ Soil Bioventing:
- No. of Venting Wells ____
  ☐ Vertical ☐ Horizontal
- Design Air Flow Rate ____ (cfm)

☐ In Situ Bioremediation
☐ Other ____

Natural Attenuation:

☐ Groundwater ☐ Soil
- Method of Evaluation:
  ☐ Historical Trends
  ☐ Site-Specific Parameters

Estimated Time of Cleanup: 73 (days)
- Method of Estimation:
  ☐ Pore Volumes (no. of pore vols. =_)
  ☑ Exponential Decay (Decay Rate) ____ (day^{-1})
  ☐ Groundwater Transport Model ____
  ☑ Other First Order Decay Rate

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

RAP Approval Date & Technology:

FACILITY INFORMATION	
Facility ID Number: *(9 digit)*	608516863
Facility Name:	AA Discount
Location:	181 West Kings Highway, Center Hill
Special Circumstances:	
Reviewer	
ATC Name & CID#:	

NOTICING

GENERAL		
☑	RAP signed, sealed, and dated by Florida P.E. (per section 471.025, F.S.)	Yes
☑	Indication whether proposed plan is for Procurement, Non-program, or Voluntary cleanup	Yes
☑	Recap of SAR information and conclusions pertinent to RAP preparation	Yes
☑	Current sampling results [within nine (9) months] used for remediation system design	Yes
☑	Potable water considerations: • method of potable water supply to site and surrounding area • locations of private wells within ¼ mile, public wells within ½ mile radius of site • FDEP district office drinking water program has been notified if contaminated groundwater contamination may affect any public or private well. Method of notification, person notified, and date	Yes
☑	Identification of underground utility locations; any which may enhance transport of contaminants	Yes
☑	Estimated cleanup time for the groundwater and soil	Yes
☑	Fencing of treatment area (unless public access is restricted by institutional controls	Yes
☑	Local, state, and federal permits to be obtained, and conditions stated	Yes

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver   Purchase Order #: B1F490

☑	Recap of alternativeds discussed and/or alternatives selected during pre-RAP conference, or cost-effectiveness analysis of alternatives and identification of recommended alternative	Yes
☑	Statement, signed, and sealed as-built (record) drawings will be provided	Yes
☑	Nuisance noise and odor to neighbors avoided by careful location of equipment and exhaust stacks or other mitigating measures	Yes

REQUIREMENTS OF THE PROCUREMENT PROCESS		
☑	For cleanup projects affected by the Pre-Approval Program Remedial Action Initiative, the requirements of this section apply. The items listed below in this section are to be taken into account for each of the operations covered by the other sections of this checklist.	Yes
☑	Cleanup Goals established. End of the Active Remediation goal: 70% of natural attenuation default concentrations (NADC), or 90% reduction of each contaminant group, in each key well in the source area, whichever is more stringent, in the specific time frame (typically one to four years). Longer cleanup times to achieve end of active remedial action goal require special justification.	Yes
☑	Pilot testing of the proposed remediation strategy is generally required. Exceptions require special justification.	Yes
☑	Remediation equipment must meet the specifications contained in the Remedial Action Initiative including reasonable safety factors.	NA
☑	System design includes adequate source area treatment wells, e.g. a safety factor of 2, and consideration of using parallel or zoned systems.	NA
☑	Ultimate cleanup target levels need to be indicated, either (CTLs) of Chapter 62-780 for unconditional NFA, or Alternative CTLs for conditional NFA. For conditional NFA, owner's acknowledgement of future institutional controls at cleanup completion should be documented.	Yes
☑	End of Active Remediation to be followed by Natural Attenuation Monitoring (NAM). An evaluation of "time to switch" from active remedial action to NAM to reach ultimate cleanup target levels may be preformed to allow for the continuation of active remedial action if justified.	NA
☑	Milestones schedule must be included in the RAP using the BPSS milestone model. The schedule must identify key wells, contaminants of concern, baseline contaminant concentrations, and time to reach the end of active remedial action. A linear concentration vs. time profile shall apply to each contaminate group in each key well.	Yes
☑	RAP must include Construction Plan and a construction schedule.	Yes

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	RAP must include a Startup Test Plan, and startup testing must be conducted in accordance with manufacturer's recommendations.	Yes
☑	Analysis of designated / key monitoring well samples for appropriate contaminants of concern for the site.	Yes
☑	Sampling of influent from recovery well(s); daily first 3 days, monthly next 2 months, quarterly thereafter.	Yes
☑	Sampling of system effluent, daily for first three days, monthly for next two months, quarterly thereafter.	Yes
☑	Water level data collected at same time & frequency of monitoring well and recovery well sampling.	Yes

REMEDIAL ACTION OPTIONS

FREE PRODUCT REMOVAL		
☐	Free product plume identification	NA
☐	Description/design details of free product recovery system including: • Oil/water product separator sizing calculations and detention time	NA
☐	Automated product pump shutdown for high level in product tank	NA
☐	Safety considerations: • Static electricity	NA
☐	Proper disposal and safe handling of flammable free product	NA

SOIL REMEDIATION - GENERAL		
☐	Volume of contaminated soil.	NA
☐	Recap of Source Removal activities and soil volume already excavated, if any.	NA
☐	Indication that contaminated soil will be remediated, or provide rationale for "no action".	NA
☐	Soil cleanup target levels identified, extent of soil contamination should be delineated by use of both OVA screening results and laboratory analysis results.	NA
☐	Use of Level 1 Risk Management Options for soil considered, if applicable, including SPLP, TRPH fractionation, and calculation of site specific SCTLs based on soil properties.	NA
☐	Proper handling & treatment of excavated, contaminated soil, or proper handling & disposal of hazardous soil (e.g. ignitable, corrosive, reactive, toxic, or peteroleum refining waste).	NA

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

LAND FARMING OF SOIL		
☐	Adequate surface area available (______sq ft) to spread soil 6 to 12 inches thick.	NA
☐	Location of land farming operation.	NA
☐	Land farming area is flat (less than 5% slope).	NA
☐	Impermeable base provided. Type: ______________________	NA
☐	Surface water runoff controls provided.	NA
☐	Groundwater monitoring plan proposed if land farm is outside of immediate contamination area.	NA
☐	Frequency of tilling provided.	NA
☐	Frequency and details of nutrient application or other enhancements provided (if proposed).	NA
☐	Soil sampling frequency and sampling methods provided.	NA
☐	Potential for land farming causing nuisance conditions evaluated.	NA
☐	Underlying soil and groundwater monitoring procedures provided and acceptable.	NA
☐	Land farming will be continued until the contaminants of concern meet soil cleanup target levels.	NA
☐	Cost-effectiveness.	NA
☐	Ultimate disposition of soil discussed.	NA
☐	Need to fence land farm area considered.	NA

LANDFILLING OF SOIL		
☐	Landfill lined and permitted by FDEP.	NA
☐	Name and location of landfill provided along with conditions of acceptance.	NA
☐	Cost-effectiveness.	NA
☐	For out-of-state landfill disposal. Evidence provided that petroleum contaminated soil disposal in the landfill complies with the landfill regulations of the other state.	NA

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

SOIL THERMAL TREATMENT / COMMERCIAL BIOREMEDIATION OF SOIL		
☐	Name and location of thermal treatment or bioremediation facility provided.	NA
☐	Facility is permitted for thermal treatment or bioremediation of petroleum contaminated soil.	NA
☐	Pretreatment soil sample analyses.	NA
☐	Cost-effectiveness.	NA

IN-SITU BIOVENTING OF SOIL	
☐	Soil cleanup criteria indentifcation
☐	Estimated mass of contaminants of concern in the vadose zone
☐	Recap of inofmation and data from pilot test study that is pertinent full-scale system design
☐	Layout: • Well type – vertical or horizontal. • Well construction details. • Location of air injection and air extraction with respect to contaminated soil plume location and depth. • Location and depth of soil gas monitoring probes with respect to contaminated soil plume and the air
☐	Design and operating parameters, equipment sizing calculations, mechanical details.
☐	Instruments, controls, gauges, and valves.
☐	Monitoring plan: CO_2; pertinent bioremediation parameters; contaminants of concern.
☐	Air emissions: • Demonstration that primary mechanism of remediation will be bioremediation and volatilization. Air flow rates will be limited based on oxygen demand for bioremediation as demonstrated by pilot study results. • Evaluation of methods for off-gas treatment if pilot test indicated that a significant amount of hydrocarbon volatilization will occur.

SOIL VAPOR EXTRACTION		
☑	Prerequisites: • Relatively permeable soil	Yes

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Recap of information and data from pilot study that is pertinent to full-scale system design.	Yes
☑	Full-scale design.	Yes
☑	Layout and spacing of SVE wells (consideration given to radius of influence and overlapping radii)	Yes
☑	Vapor extraction well(s): • Number of wells • Cubic feet per minute (cfm) of each well • Total cfm • Well type (vertical or horizontal) • Well construction details	Yes
☑	Pneumatic design: • Operating vacuum @wellhead(s) (inches of water). • Piping system friction losses. • Pump motor (hp) based on system losses plus required vacuum at wellhead.	Yes
☑	Vacuum source type: regenerative blower, positive displacement vacuum pump, or other • Design specifications: cfm @ inches of water	Yes
☑	Moisture separator/condensation trap ("knock out pot") prior to inlet of vacuum pump	Yes
☑	Surface sealing provided for vacuum extraction, or existing concrete or asphalt adequate	Yes
☑	Safety • System operation at approximately 25% of Lower Explosive Limit (LEL).	Yes
☑	Instrumentation, gauges, and appurtenances	Yes
☑	Air emissions control (general) - method of off-gas treatment to be provided during first month of system operation (provide details in Section X or XI for carbon adsorption or themal oxidation of off-gas, or provide details of an alternative method.	Yes
☑	• Sample and analyze air emissions for total petroleum hydrocarbons, weekly for the first month, monthly for the next two months, quarterly thereafter. • Vacuum measurement locations (suggestion: use monitor wells at various radial distances from extraction wells). • Acknowledge that air emission controls must be provided for at least first 30 days, but may have to be continued longer until petroleum hydrocarbon emissions to the atmosphere are less than 13.7 lbs/day.	Yes

VAPOR-PHASE CARBON ADSORPTION (for control air emissions)		
☑	Recap information and data from pilot stude that is pertinent to full-scale system design, if a pilot was conducted.	Yes
☑	Cost-effectiveness evaluation in comparison to other alternatives for control of air emissions.	Yes
☑	Mechanical details, sizing calculations, and operating parameters.	Yes

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Instrumentation, controls, gauges, sampling, and valves.	Yes
☑	Safety: • Operation of system below LEL for type of vapors being handled	Yes

THERMAL/CATALYTIC OXIDATION (for control air emissions)		
☑	Cost-effectiveness evaluation in comparison to other alternatives for control of air emissions	NA
☑	Mechanical details, equipment sizing calcuations, and operating parameters	NA
☑	Instrumentation, controls, gauges, and valves. [Schematic or mobile unit manufacture's drawings indicating instrumentation, controls, gauges, and valves for all process streams (contaminant-laden influent, fuel gas, and combustion air)].	NA
☑	Safety considerations include (but not limited to): • Bleed valve or dilution control valve to maintain influent flammable vapor concentration at 25% of the LEL • Air purge prior to re-ignition • Observance of appropriate requirements in Series 500 articles of the National Electrical Code - equipment shall meet either Class 1, Group D, Division 1 or Class 1, Group D, Division 2 hazardous area requirements, whichever is applicable, when located in a hazardous area as defined by the code. • Use of thermal or catalytic oxidizers which meet appropriate fire codes for handling natural or propane gas and prevention of furnace explosions – National Fire Protection Association, Industrial Risk Insurer’s, Factory Mutual, etc. Some of the most important safety shutdowns for gas-fired burners occur upon: high gas pressure; low gas pressure; loss of combustion supply air; loss or failure to establish flame; loss of control system actuating energy; power failure.	NA

GROUNDWATER EXTRACTION		
☑	Feasibility of using existing on-site wells for groundwater extraction considered	NA
☑	Recovery well summary: • Recovery well or trench location(s) and construction details included (diameter, screen length, grout, etc.). • Recovery well depth and screen length for depth of contamination.	NA
☑	Predicted horizontal and vertical area of influence provided.	NA
☑	Expected drawdown in recovery well or trench.	NA

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Consideration of multiple well configuration to minimize drawdown.	NA
☑	Groundwater pump performance requirements, sizing, and description: • Hydraulic design considerations (friction losses and suction lift). • Pump performance curve or information provided (flow rate vs. pressure). • Pump manufacturer, model; hp, rpm.	NA
☑	Automated well level controls provided for stopping/starting groundwater pump(s).	NA
☑	Totalizing flowmeter installed on influent line from each groundwater recovery pump.	NA
☑	Check valve provided on pump discharge piping if not integral to pump.	NA
☑	Shutoff/throttling valve provided on pump discharge piping.	NA

GROUNDWATER TREATMENT SYSTEM - GENERAL		
☑	Influent concentrations for each contaminant of concern, for design of treatment system, based on either actual dynamic pump test sample, weighted averaging procedure, or other reasonable assumption.	NA
☑	Feasibility & cost-effectiveness of direct discharge of recovered contaminated groundwater to sewer treatment plant, instead of onsite treatment.	NA
☑	Site piping summary: • Schematics of all treatment components, piping, valves, controls and appurtenances provided. • Influent and effluent sampling ports provided. • Piping type and size provided.	NA
☑	Fouling & scaling considerations • Whether control of iron fouling is necessary, either by filtration of influent to remove particulate-bound iron, and/or by removal or sequestering of dissolved iron to prevent precipitation in process equipment items. • Whether pretreatment or other measures necessary to prevent precipitation of calcium carbonate (Langelier Index). • Whether pretreatment or scheduled O&M measures will be needed for control of biofouling.	NA

AIR STRIPPING TREATMENT PROCESS

Site Manager: Samuel Shiver Purchase Order #: B1F490

☐	Packed tower • Type, size, and surface area of packing. • Design and operating parameters, sizing calculations, mechanical details (tower height; packing type, height, surface area; air/water ratio; pressure drop; blower type, model, hp; mist eliminator; etc.).	NA
☐	Diffused aerator (tank type) - Design and operating parameters, sizing calculations, mechanical details (tank volume; contact time; air flow rate; pressure drop; removal efficiency of contaminants of concern; blower type, model, hp; etc.).	NA
☐	Low profile air stripper - Design and operating parameters, sizing calculations, mechanical details (number of trays; water flow rate; air flow rate; air/water ratio; pressure drop; blower type, model, hp; mist eliminator).	NA
☐	General: • Instrumentation, controls, gauges and valves. • Air emissions calculations; emissions stack height. • Equipment description if emissions treatment necessary. • Automated recovery well shutdown when blower failure occurs. • Sampling of effluent, daily for first three days, monthly for next two months, quarterly thereafter	NA

LIQUID-PHASE CARBON ADSORBTION		
☑	Recap of information and data from pilot study that is pertinent to full-scale system design, if a pilot was conducted.	Yes
☑	Indication whether adsorption is for primary treatment of groundwater or polishing of effluent.	Yes
☑	Carbon specifications.	Yes
☑	Carbon unit(s) sizing calculations (carbon usage rate, contact time, pressure losses) design assumptions.	NA
☑	TOC in groundwater determined and effect on carbon usage considered.	NA
☑	Need for sand filter or cartridge unit prior to carbon unit considered.	NA
☑	Pressure gauge and pressure relief valve provided on carbon (and sand) filter.	NA
☑	Carbon disposal and replacement method.	NA
☑	Series configuration of carbon units considered to allow for maximum carbon utilization and prevention of contaminant breakthrough to system effluent.	NA
☑	Automated recovery well shutdown if primary carbon unit pressure too high.	NA

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Schedule for sampling between and after carbon adsorption units.	NA

IN SITU AIR SPARGING OF GROUNDWATER		
☑	Prerequisites: • No or little free product which could spread via sparge turbulence, or prolong sparging. • Volatile (C3-C10) petroleum fractions with Henry's Constant ≥ 0.00001 atm*m3/mol (approx. rule of thumb, unless biosparging is proposed). • No high concentrations of metals (iron, magnesium) to form oxides which plug aquifer or well screens, or high concentrations of dissolved calcium, which could react with CO_2 in air to clog aquifer w/calcium carbonate.	Yes
☑	Recap of information and data from pilot study that is pertinent to full-scale system design.	Yes
☑	Groundwater contamination plume coverage: • Location(s) and radius of influence for full-scale air injection well(s). • Adequate coverage by overlapping radii of influence if multiple well system.	Yes
☑	Air injection well(s): no. of wells; well design; operating air pressure at wellheads; cfm each well; total cfm 26.	Yes
☑	Avoidance of long screen allowing air to diffuse at top portion only, where air flow resistance is least (typ screen is 1 to 3 ft long).	Yes
☑	Well depth and screened interval (or depth of sparge tip) appropriate with respect to depth of contamination.	Yes
☑	Vapor extraction well(s) in conjunction w/sparging situated properly to recover volatiles and prevent their release to atmosphere: • Injection cfm of air typically 20 to 80% of vapor extraction cfm (0.2 to 0.8). • Automatic shutdown of air injection upon loss of, or low, vapor extraction system vacuum, or failure of vacuum pump motor, to prevent air emissions. • Adequate and cost-effective treatment of vapor extraction system off-gas proposed to prevent air emissions.	Yes
☑	Compressor: • Design: cfm @ psig; operating cfm @ psig. • Type; manufacturer; model; motor hp; rpm; performance curves; air filter at compressor inlet; oil trap or oil-free compressor to avoid introducing more contamination to aquifer.	Yes
☑	Safety: pressure relief valve at discharge of compressor and/or high pressure switch for automatic shutdown.	Yes
☑	Instrumentation and gauges: pressure indicating gauges at each sparging well.	Yes
☑	Air flow control: shutoff/throttling valve at each well; other flow control device or method.	Yes

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

IN SITU AIR SPARGING OF GROUNDWATER		
☑	General: • Media to be remediated: groundwater; soil. • Application method: direct-injection; recirculating/re-injection type system; addition to excavation pit. • Aerobic or anaerobic. • Stimulation of indigenous microorganisms or addition of microorganisms.	Yes
☑	Recap of information and data from pilot study that is pertinent to full-scale system design.	Yes
☑	Design and operating parameters (e.g.: injection well construction details; layout and spacing of wells commensurate with injection radius of influence for adequate horizontal coverage; screened interval of injection wells commensurate with vertical extent of contamination for adequate vertical coverage; injection pump develops adequate pressure and flow rate for injection, for the site-specific conditions).	Yes
☑	Dosage (of nutrients and/or microorganisms, per pound of hydrocarbon contaminants to be biodegraded). (Some bioremediation products may express dosage as a required amount per cubic yard of contaminated media.)	Yes
☑	RAP (or RAP Mod) must contain the necessary underground injection control information required by Chapter 62-528 FAC. [That is, the RAP must contain enough information for a state or local program reviewer to fill out the 2-page UIC notification memorandum titled "Proposed Injection Well(s) for In Situ Aquifer Remediation at a Petroleum Remedial Action Site".] This includes the following information: • Chemical analysis (composition) of the fluid to be injected. Note: The injected fluid must meet primary and secondary drinking water standards of Chapter 62-550, FAC, and the minimum groundwater criteria of Chapters 62-520 and 62-777 FAC, otherwise Rule 62-522.300(2)(c) may apply and/or a zone of discharge variance may be necessary. • Number of injection wells. • Number of injection events. • Injection volume per well per injection event. • Total injection volume (i.e. the total for all injection wells, all injection events).	Yes
☑	Anticipated schedule of injection events for nutrients and/or microorganisms (i.e. the timing and frequency of injections over the life of the project).	Yes

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Provide additional oxygen, if necessary, if the bioremediation is aerobic and site's groundwater is lacking in dissolved oxygen. (method by which additional oxygen will be delivered; provide design details if method of delivery is mechanical, e.g. air sparge, O2 injection, iSOC, etc.; provide chemical information if oxygen is supplied chemically: e.g. magnesium peroxide, calcium peroxide, hydrogen peroxide, etc.).	Yes
☑	Sampling plan includes not just the analysis of samples for petroleum contaminants of concern at a site, but also analyses necessary for any of the following that apply: compliance with the underground injection control regulations of Chapter 62-528; compliance with Rule 62-522.300(2)(c); and compliance with the terms of an injection zone of discharge variance. Also, analysis for more than just the reagents may be necessary, depending on the situation. In some cases, if there are environmental or toxicological concerns, it may be necessary to include analysis for intermediate degradation products of the reagents, or intermediate by-products formed by the interaction of those reagents with the petroleum contaminants of concern at a site.	Yes
☑	Other samples and operating parameter measurements for a bioremediation project may include, but are not necessarily limited to the following: pH, DO, ORP, N, P, Temperature, TOC, Alkalinity., microbe counts.	Yes

INFILTRATION GALLERY		
☑	Recap of field percolation test results (preferably with double-ring infiltrometer).	Yes
☑	Infiltration gallery construction details and location (upgradient location if site layout allows).	Yes
☑	Gallery calculations/assumptions with mounding analysis.	Yes
☑	Piezometer and cleanout pipe in gallery.	Yes
☑	Geotextile filter fabric to be installed around and above gallery.	Yes
☑	Discussion or modeling of gallery for effect on plume migration.	Yes

INJECTION WELL (FOR EFFLUENT DISPOSAL)		
☑	Discussion of injection zone and relevant lithology information.	NA
☑	Recap of information and data from pilot study that is pertinent to full-scale system design, if a pilot was conducted.	NA
☑	Injection well location and construction details.	NA
☑	Screened interval appropriate.	NA

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Effluent discharge pump adequately sized for required injection flow rate and pressure.	NA
☑	Carbon polishing unit (or equivalent).	NA
☑	Air release valve at highest point of effluent discharge piping.	NA
☑	Injection rate (well hydraulics) calculations.	NA
☑	Underground Injection Control (UIC) inventory information provided. (RAP or RAP Mod must contain enough information for a technical reviewer to complete the 2-page UIC effluent injection notification.)	NA
☑	Evaluation of injection well's effect on potable wells and plume migration.	NA

IN SITU CHEMICAL OXIDATION		
☑	Media to be remediated: groundwater; soil.	NA
☑	Recap of information and data from pilot study that is pertinent to full-scale system design.	NA
☑	Design and operating parameters (e.g.: injection well construction details; layout and spacing of wells commensurate with injection radius of influence for adequate horizontal coverage; screened interval of injection wells commensurate with vertical extent of contamination for adequate vertical coverage; flow rates; temperatures; pressures; pH; concentrations, etc.).	NA
☑	Amount of reagents required per pound of hydrocarbons to be destroyed (theoretical amount, actual amount).	NA
☑	RAP (or RAP Mod) must contain the necessary underground injection control information required by Chapter 62-528 FAC. [That is, the RAP must contain enough information for a state or local program reviewer to fill out the 2-page UIC notification memorandum titled "Proposed Injection Well(s) for In Situ Aquifer Remediation at a Petroleum Remedial Action Site".] This includes the following information: • Chemical analysis (composition) of the fluid to be injected. Note: The injected fluid must meet primary and secondary drinking water standards of Chapter 62-550, FAC, and the minimum groundwater criteria of Chapters 62-520 and 62-777 FAC, otherwise Rule 62-522.300(2)(c) may apply and/or a zone of discharge variance may be necessary. • Number of injection wells. • Number of injection events. • Injection volume per well per injection event. • Total injection volume (i.e. the total for all injection wells, all injection events).	NA

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

☑	Sampling plan includes not just the analysis of samples for petroleum contaminants of concern at a site, but also analyses necessary for any of the following that apply: compliance with the underground injection control regulations of Chapter 62-528; compliance with Rule 62-522.300(2)(c); and compliance with the terms of an injection zone of discharge variance. Also, analysis for more than just the reagents may be necessary, depending on the situation. In some cases, if there are environmental or toxicological concerns, it may be necessary to include analysis for intermediate degradation products of the reagents, or intermediate by-products formed by the interaction of those reagents with the petroleum contaminants of concern at a site.	NA
☑	Other samples and operating parameter measurements for a chemical oxidation project may inlcude, but are not necessarily limited to the following: pH, DO, ORP, Temperature, and Alkalinity.	NA
☑	Anticipated schedule of injection events for reagents (i.e. the timing and frequency of injections over the life of the project).	NA
☑	Safety (items applicable to fire, explosion, toxicological and safe handling of chemicals may include, but are not necessarily limited to those listed below): • Material safety data sheets, toxicity, or other information pertinent to the chemicals and catalysts involved. • Safe handling of chemicals: avoidance of mixing, premature mixing, or improper storage of incompatible chemicals. • Lower Explosive Level (LEL) considerations. • Potential for vapor migration, either passively or by convection, or driven by air or other gases used, or generated by the heat of exothermic chemical reactions or the vaporization of free product by such heat. • The minimum tolerable distance between underground storage tanks and product piping and any in situ heat-generating process. • The need to replace the flammable contents of petroleum storage tanks and their associated piping with non-flammable inerts such as nitrogen or carbon dioxide, to reduce risk of fire and explosion. • Observance of National Electrical Code (typically Series 500 articles for Class I, Group D, Division 1 or 2 hazardous area requirements) (for electrical equipment items located in a hazardous area). • Appropriate chemical-resistant and/or spark-resistant materials of construction for equipment items. • Personal protection of workers. • Safety considerations regarding neighbors and passersby.	NA

LEAD (This section may be adapted to other heavy metals if necessary.)		
	Discussion of area(s) where groundwater lead concentration exceeds 15 ppb.	NA
	Lead concentrations (ppb): unfiltered (____); filtered (____); background (____).	NA

Remedial Action Plan (RAP) Checklist

Site Manager: Samuel Shiver Purchase Order #: B1F490

	Proposal for lead removal by filtration if unfiltered sample is greater than 15 ppb and filtered sample is less than 15 ppb.	NA
	Method of lead removal, including pertinent design calculations.	NA
	If lead (or other heavy metals) will not be removed by filtration, then provide details of proposed treatment.	NA

ALTERNATIVE EFFLUENT DISPOSAL METHODS		
☑	Cost-effectiveness comparison of alternatives (including general permit fee of $2,500 per year in the cost estimate for NPDES disposal, if it is one of the alternatives being compared).	NA
☑	For surface water discharge: • Conditions for NPDES general permit met. • Indication that notice of intent for NPDES permit will be submitted after RAP approval.	NA
☑	If applicable, consumptive use permit obtained from Water Management District.	NA
☑	Approval from municipality for sewer discharge, and conditions and effluent standards to be met.	NA
☑	Applicable permits for stormwater discharge.	NA

APPENDIX E

Memorandum **Florida Department of Environmental Protection**

TO: Cathy McCarty, P.G.
Florida Department of Environmental Protection
Bureau of Water Facilities Regulation
Underground Injection Control Section – MS 3530
2600 Blair Stone Road, Tallahassee, Florida 32399-2400

THROUGH: John F. Wright, P.E.
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 2 – MS 4545

FROM: Robert Schroeder & Thomas H. Bennett
(An employee of a contracted local cleanup program)
MAS Environmental, LLC

DATE: 4/25/2018

SUBJECT: **In Situ Air Sparging Aquifer Remediation Well(s) at a Petroleum Remedial Action Site**

Pursuant to paragraph 62-528.630(2)(c), F.A.C., inventory information is provided below to notify you of proposed Class V, Group 4, aquifer remediation well(s) to be constructed for groundwater remediation at a petroleum remediation site. The remediation system has been designed to inject atmospheric air only with no additional chemical additives.

Facility name: AA Discount Beverage

Facility address: 181 West Kings Highway

City/County: Center Hill, Sumter County, FL

Latitude/Longitude: 28°38’58.85’’N -82º0’2.37’’ W
(of center of air sparging well field)

FDEP Facility Number: 60/8516863

Facility owner’s name: Gautambhai & Falguni Patel

Facility owner’s address: 7300 SR 471
Bushnell, FL

Well contractor’s name: MAS Environmental LLC
(or environmental cleanup contractor responsible for design)

Well contractor’s (or environmental cleanup contractor) address: 1808 N Franklin St
Tampa, Fl 33602

The design of the treatment system consists of the following:

Design total air flow rate: 3 (cfm) at 30 (psi)
Number of air sparging wells: 10
Total estimated aquifer area affected by air sparging: 1000

The air sparging wells will be installed in the surficial aquifer. The following is a summary description of the affected aquifer:

Name of aquifer: surficial
Depth to groundwater (feet): 22
Aquifer thickness (feet): at least 50 feet
Areal extent of contamination (square feet): 900

A site map showing the air sparging well locations and depicting composite radii of influence is attached. The air sparging wells will be designed as follows:

Number of wells: AS-1 through AS-10
Diameter of well(s) (i.e., riser pipe & screen) (inches): 2
Total range of depths of screened intervals of all air sparging well(s) (feet):
43 to 45 feet below land surface

Note: As the site rehabilitation proceeds, it may be necessary to cease operation of some air sparging wells, modify air flow rates to other wells, or add additional wells based on changes in the extent and degree of groundwater contamination. Such changes to increase contaminated groundwater cleanup efficiency do not need to be reported to the UIC Section.

The RAP estimates that site rehabilitation will take 0.2 years.

The proposed remediation plan was approved on _________ by an enforceable approval order. A copy is attached. The remediation system installation is expected to commence within 60 days. Please call me at ______________ if you require additional information.

APPENDIX F

RA CONSTRUCTION AND START-UP PLAN OF ACTION

Remedial Action Plan

Sunoco Station-American Inn

	MONTH 1				MONTH 2				MONTH 3				MONTH 4				MONTH 5				MONTH 6			MONTH 7		
TASK	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12	WEEK 13	WEEK 14	WEEK 15	WEEK 16	WEEK 17	WEEK 18	WEEK 19	WEEK 20	WEEK 21	WEEK 22	WEEK 23	WEEK 24	WEEK 25	WEEK 26
PE Sealed Construction Drawings																										
Equipment Order																										
Permit application																										
Baseline Sampling																										
Pre-Construction Meeting(s)																										
Well Installations (including preburn collection)																										
Underground Construction																										
Equipment Delivery / Setup																										
Electrical Inspection /Power Release																										
System Start-up																										
As-built Drawings																										
Start-up Report																										