Five-Year Review Report

First Five-Year Review Report
for
United Metals, Inc.
FLD098924038

Marianna
Jackson County, Florida

October 2014

United States Environmental Protection Agency
Region 4
Atlanta, Georgia

Approved by: Carol J Monell for

Date: 10/8/14

Randall Chaffins
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First Five-Year Review Report
for
United Metals, Inc.
Highway 71 South
Marianna
Jackson County, Florida

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FYR	Five-Year Review
GCTL	Groundwater Cleanup Target Level
HQ	Hazard Quotient
IC	Institutional Control
LTRA	Long-Term Response Action
MCL	Maximum Contaminant Level
µg/kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
MNA	Monitored Natural Attenuation
mg/kg	Milligrams per Kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCOR	Preliminary Close Out Report
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RG	Remedial Goal
ROD	Record of Decision
RPM	Remedial Project Manager
RSLs	Regional Screening Levels
SCTL	Soil Cleanup Target Levels
SPLP	Synthetic Precipitation Leaching Procedure
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
UMI	United Metals, Inc.
VOCs	Volatile Organic Compounds

Executive Summary

The 175-acre United Metals, Inc. (UMI) Superfund site (the Site) is located in a rural area about 1,000 feet east of Highway 71 and about 3 miles south of Interstate 1-10 in Marianna, Jackson County, Florida. Battery recycling operations took place on the Site between 1979 and 1991. Operations consisted of cutting the tops off batteries, separating the lead plates from the plastic casings, crushing and pelletizing the casings, and sending them off site for further processing. Facility activities also included the discharge of wastewater to an unlined holding pond via a concrete-lined trench. In the early 1990s, the Florida Department of Environmental Protection (FDEP) determined that these activities resulted in contamination of soil, sediment and ground water with heavy metals. The United States Environmental Protection Agency (EPA) placed the Site on the Superfund program's National Priorities List (NPL) on April 30, 2003.

EPA selected a remedy to address the Site's contamination in a 2006 Record of Decision (ROD) and updated the remedy with an Explanation of Significant Differences (ESD) in September 2010. The final selected remedy consisted of monitored natural attenuation (MNA) of contaminated ground water; excavation, solidification and capping of contaminated soils and sediment; and the implementation of institutional controls. After completion of remedy construction, EPA issued the Site's Preliminary Close Out Report (PCOR) on September 14, 2011. Ground water monitoring will continue until cleanup goals are met.

This is the first Five-Year Review (FYR) for the Site. The triggering action for this FYR was the on-site construction start date of the remedial action on October 14, 2009.

The remedy at the Site is protective of human health and the environment in the short term. Contaminated soils and sediment were excavated, treated and contained in a capped monolith. The cap prevents potential exposure to contaminants of concern (COCs) in surface soils and sediment and helps prevent contaminants from leaching into the ground water below. Additionally, institutional controls protect the integrity of the monolith and further limit the potential of contaminant exposure by prohibiting digging in areas of remaining soil contamination under building foundations and restricting ground water use. In general, ground water sampling results indicate that ground water quality at the Site has improved since the soil remedial action; this improvement is expected to continue. However, in order for the remedy to be protective in the long term, more information and data is necessary for manganese in the surficial and Floridan aquifers to determine if additional actions are necessary, including monitoring wells and/or institutional controls.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: United Metals, Inc.		
EPA ID: FLD098924038		
Region: 4	**State:** FL	**City/County:** Marianna/Jackson County

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA **If "Other Federal Agency" selected above, enter Agency name:** Click here to enter text.
Author name: Eric Marsh and Melissa Oakley (Reviewed by EPA)
Author affiliation: Skeo Solutions
Review period: 03/01/2014 – 10/14/2014
Date of site inspection: 03/27/2014
Type of review: Statutory
Review number: 1
Triggering action date: 10/14/2009
Due date *(five years after triggering action date)*: 10/14/2014

Five-Year Review Summary Form (continued)

Issues/Recommendations

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Monitoring			
	Issue: The extent of manganese contamination in surficial ground water is not fully defined.			
	Recommendation: Further evaluate manganese in the surficial ground water to determine if additional monitoring wells and institutional controls are needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA/State	10/14/2017

OU(s): 1	Issue Category: Monitoring			
	Issue: The extent of manganese contamination in the Floridan Aquifer is not fully defined.			
	Recommendation: Further evaluate manganese in the Floridan Aquifer to determine if additional monitoring wells and institutional controls are needed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA/State	10/14/2017

Five-Year Review Summary Form (continued)

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Addendum Due Date (if applicable):*

Protectiveness Statement:
The remedy at the Site is protective of human health and the environment in the short term. Contaminated soils and sediment were excavated, treated and contained in a capped monolith. The cap prevents potential exposure to contaminants of concern in surface soils and sediment and helps prevent contaminants from leaching into the ground water below. Additionally, institutional controls protect the integrity of the monolith and further limit the potential of contaminant exposure by prohibiting digging in areas of remaining soil contamination under building foundations and restricting ground water use. In general, ground water sampling results indicate that ground water quality at the Site has improved since the soil remedial action; this improvement is expected to continue. However, in order for the remedy to be protective in the long term, more information and data is necessary for manganese in the surficial and Floridan aquifers to determine if additional actions are necessary, including monitoring wells and/or institutional controls.

Environmental Indicators
- Current human exposures at the Site are under control. *- Contaminated ground water migration is under control.*

Are Necessary Institutional Controls in Place?
☒ All ☐ Some ☐ None

Has EPA Designated the Site as Sitewide Ready for Anticipated Use?
☒ Yes ☐ No

Has the Site Been Put into Reuse?
☒ Yes ☐ No

First Five-Year Review Report
for
United Metals, Inc. Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

EPA prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

Skeo Solutions, an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the United Metals, Inc. Superfund site (the Site) in Marianna, Jackson County, Florida. EPA's contractor conducted this FYR from March to October 2014. EPA is the lead agency for developing and implementing the remedy for the Superfund-financed cleanup at the Site. The Florida Department of Environmental Protection (FDEP), as the support agency representing the State of Florida, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the first FYR for the Site. The triggering action for this statutory review is the on-site construction start date of the remedial action. The FYR is required because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Battery recycling facility constructed on site	September 1979
United Metals, Inc. (UMI) began battery recycling operations on site	November 1979
UMI applied to Florida Department of Environmental Regulation (FDER) for a permit to construct holding ponds	June 17, 1980
UMI filed a Notification of Hazardous Waste Activity with EPA	August 1980
UMI and FDER entered a Consent Order to address site issues	August 1981
UMI met Consent Order requirements and received a permit for operation	June 1984
EPA discovered numerous violations during a Resource Conservation and Recovery Act (RCRA) inspection at the Site	July 1986
Anrich purchased UMI	June 1989
FDER discovered numerous RCRA violations during a site inspection	May 22, 1991
FDER filed a complaint for injunctive relief, civil penalties and costs against UMI in the Jackson County Circuit Court	February 1992
Court issued a Final Judgment against UMI	November 6, 1992
FDEP (Florida Department of Environmental Protection) conducted a site investigation	June 1993
EPA completed the site inspection report	March 1, 1994
FDEP conducted an expanded site investigation	December 1994
EPA completed the expanded site inspection report	June 1, 1995
EPA began the first removal action	January 1996
EPA completed the first removal action	March 6, 1996
Faircloth Properties, Inc. purchased the property pursuant to a tax sale for delinquent taxes	1998
EPA placed the Site on the National Priorities List (NPL)	April 30, 2003
EPA issued the combined remedial investigation/feasibility study	December 2005
EPA began the second removal action	January 25, 2006
EPA completed the second removal action	May 26, 2006
EPA issued Record of Decision (ROD) and initiated remedial design	September 28, 2006
EPA completed remedial design	September 29, 2008
EPA initiated remedial action	October 14, 2009
EPA issued an Explanation of Significant Differences (ESD)	September 10, 2010
FDEP and EPA conducted pre-final inspection	October 14, 2010
EPA submitted Ground Water Implementation Status Report	January 2011
EPA submitted Ground Water Implementation Status Report	May 2011
EPA conducted the final site inspection	June 21, 2011
Construction completed, EPA issued the Preliminary Close Out Report (PCOR)	September 14, 2011
Remedial action completed and remedial action report published	October 20, 2011
EPA submitted Ground Water Implementation Status Report	November 2011
EPA submitted Ground Water Implementation Status Report	April 2012
EPA submitted Ground Water Implementation Status Report	July 2012
EPA submitted Ground Water Implementation Status Report	October 2012
EPA submitted Ground Water Implementation Status Report	January 2013
Cumbaa Family Trust purchased the Site	February 2013
EPA submitted Ground Water Implementation Status Report	July 2013
Property owner and FDEP entered restrictive covenant	August 22, 2013

3.0 Background

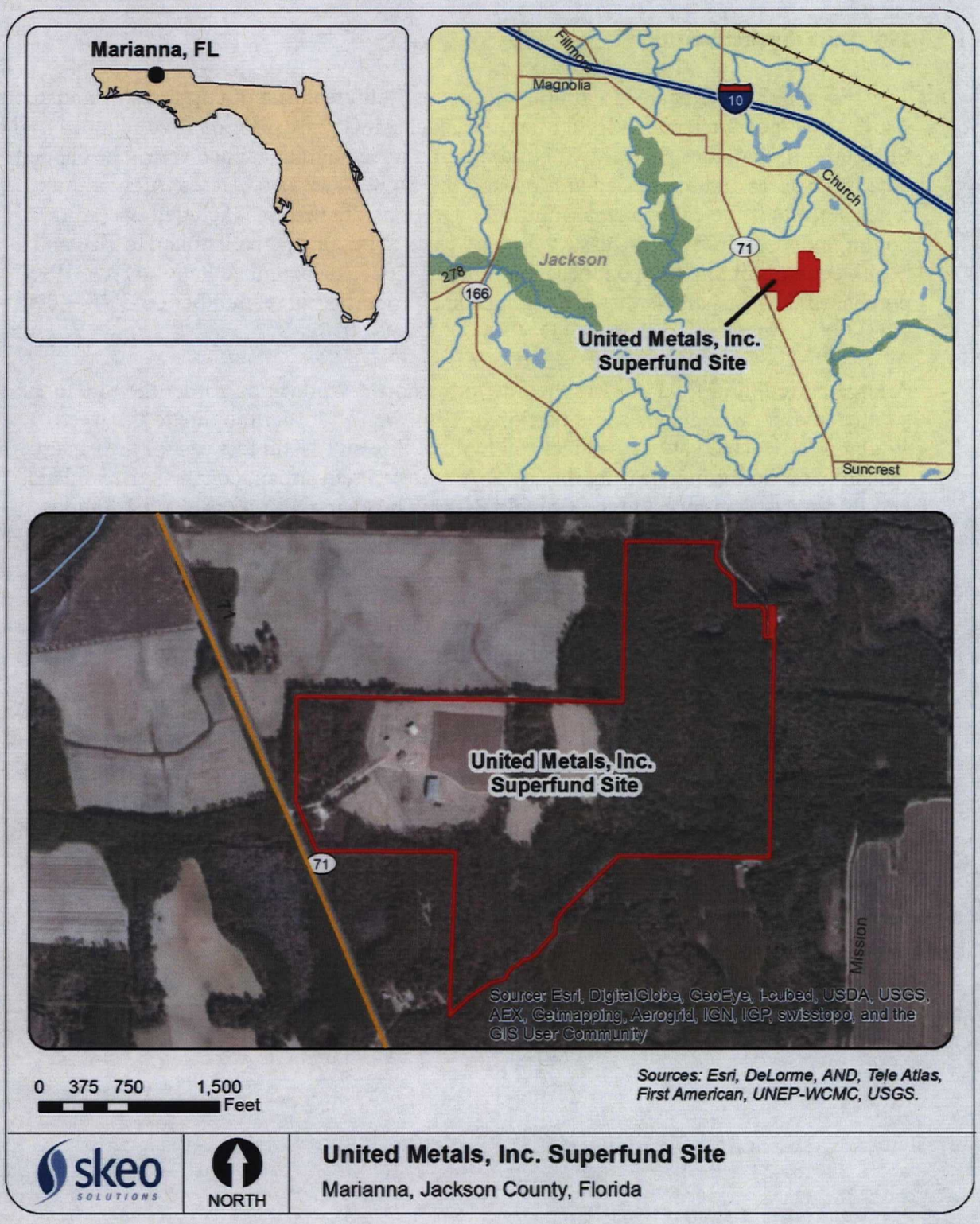
3.1 Physical Characteristics

The 175-acre Site is located in a rural area about 1,000 feet east of Highway 71 and about 3 miles south of Interstate 1-10 in Marianna, Jackson County, Florida (See Figure 1). The Site currently includes a shed, two buildings and a rectangular capped area. The capped area is 5.6 acres and the fenced area around the capped area is 6.3 acres. A chain-link fence surrounds the capped area (Figure 2). Original site features included two unlined holding ponds, a battery processing facility, truck shop, plastic pellet plant, office and health center building (Appendix J). In February 2013, the Cumbaa Family Trust 1995 purchased the two parcels that make up the site property (parcel number 06-3N-09-0000-0060-0000 and parcel number 06-3N-09-0000-0060-0010).

A large agricultural field borders the Site to the north. Woodlands border the Site to the south and east. Woodlands and a portion of Highway 71 border the Site to the west. Wetlands are located about 700 feet south of the Site and 1,000 feet east of the eastern fenceline of the former UMI facility area. An intermittent stream connects the wetlands and flows west-southwest to the Chipola River. The Chipola River is about 1.5 miles west of the Site. An unoccupied residence is about 1,600 feet northwest of the Site.

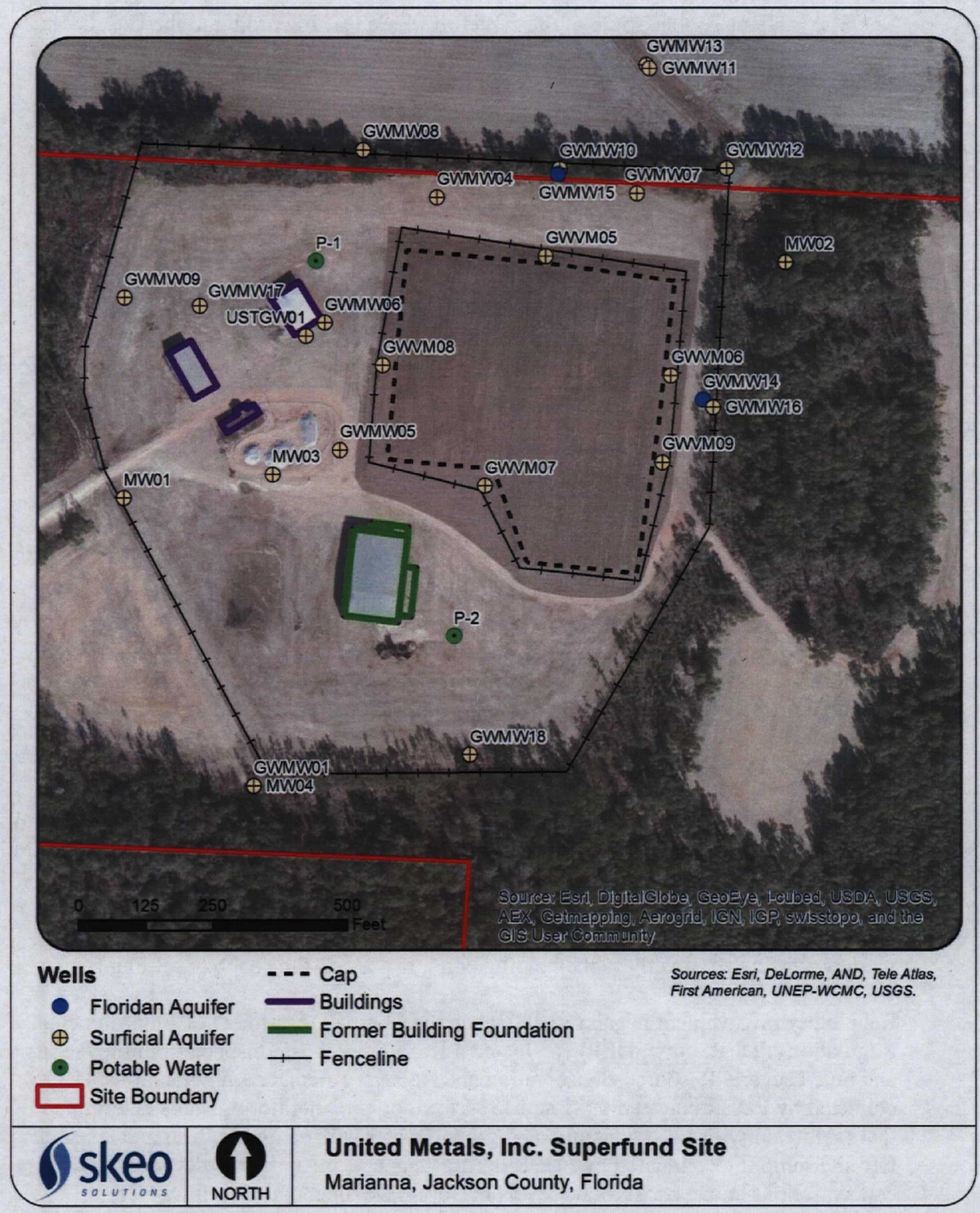
The Site is fairly level and has an average elevation of 100 feet above mean sea level. The property is located in the Marianna River Valley Lowlands physiographic province. Surface soils are generally sandy and underlain by clays. Sinkhole formation in the Site area is prevalent. The ground water occurs in two aquifer systems at the Site. The surficial aquifer system consists of sand, sandy clay, clayey sand and clay. The thickness of the surficial aquifer averages about 40 feet at the Site. The Floridan Aquifer system is separated from the surficial aquifer system by a clayey semi-confining unit. The Floridan Aquifer system (Suwannee Limestone) is generally 50 to 60 feet below land surface in the site area. There is a ground water divide east of the former battery recycling building. The surficial ground water generally flows to the west on the western side of the divide and to the east on the eastern side of the divide. Near the Site, ground water in the Floridan Aquifer flows to the west and southwest, where it discharges to the Chipola River.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

3.2 Land and Resource Use

The Site is about 7 miles south of the center of Marianna. According to the U.S. Census Bureau, the City of Marianna had a population of about 9,000 people in 2013. The area around the Site is sparsely populated and is primarily agricultural and wooded. Battery recycling occurred on the Site between 1979 and 1991. The former battery recycling operations area occupies about 24 acres. The former operations area includes a 6.3-acre fenced area, which includes a 5.6-acre capped area that is unused. The rest of the site property is zoned for light residential development. The current tenant leases the Site for auto-scrapping operations. The tenant also leases roll-off storage containers, which are stored on site. All site use activities occur outside of the fenced, capped area.

The Floridan Aquifer system is the primary source of potable water and irrigation water in Jackson County. Most residents in the area rely on private wells for potable water. There are two wells on the Site that were previously used to provide production water for facility operations. According to the 2011 remedial action report, a previous property owner who resided on the Site obtained drinking water from one of these production wells; this well is installed in the Floridan Aquifer. Uses of the nearby Chipola River include recreational fishing, swimming and boating.

3.3 History of Contamination

Construction of the battery recycling facility began in September 1979 and operations began in November 1979. The UMI facility primarily recycled lead-acid batteries, but the facility also recycled nickel-cadmium batteries. Operations included cutting the tops off batteries and separating the lead plates from the plastic casings. Additional processing activities included crushing and pelletizing the plastic battery casings and sending them to an off-site extruding facility. Operations also included transporting the lead components and lead oxide from the batteries to an off-site lead smelting facility.

The liquid in the batteries drained to a reservoir and flowed through a channel in the floor to a series of concrete basins. Facility operators used lime to neutralize the wastewater in the basins. The lead-oxide residues were precipitated for reclamation. The wastewater then flowed from the concrete basins to an unlined holding pond east of the recycling operations building via a concrete-lined trench. It was reported that some of the wastewater flowed directly to the holding pond, bypassing the concrete settling basins.

Regulatory involvement began in 1980 when the Florida Department of Environmental Regulation (FDER, now FDEP) conducted a Hazardous Waste Inspection of the facility and noted several Resource Conservation and Recovery Act (RCRA) violations. Data collected by FDER between 1981 and 1984 from on-site monitoring wells determined that facility activities had contaminated ground water with cadmium, lead and arsenic. Off-site sampling conducted by FDER during May and June of 1981 detected metal concentrations above background levels in a drainage ditch under Highway 71, immediately south of the UMI site entrance.

Between 1986 and 1991, EPA and FDER investigations determined that site activities also resulted in the contamination of holding pond sediment and surface water with high concentrations of lead, copper and zinc.

3.4 Initial Response

Following the 1980 FDER site inspection, in 1981 UMI entered into a Consent Order with FDER to address the operational and pollution concerns noted during the inspection. In June 1983, UMI completed the construction of a closed-loop wastewater treatment system, removed contaminated soils and sediments from the drainage ditch and holding pond, and implemented a limited ground water monitoring program. UMI stored the excavated soil and sediment from the pond and ditch in the on-site Materials Storage Building (Appendix J shows historical building locations). In June 1984, FDER determined that UMI met the requirements of the Consent Order.

EPA conducted an inspection in July 1986 and found numerous RCRA violations. Violations noted during the EPA inspection included improper closure of the holding pond, improper storage of hazardous waste, improper ground water monitoring, and operation of a hazardous waste storage and treatment facility without a permit.

In 1989, UMI sold the property to Anrich. Anrich renovated the process area, installed new pollution control devices and conducted limited battery reclaiming operations at the Site. In 1991, FDER conducted another Hazardous Waste Inspection of the facility and noted several violations, including storage of a hazardous waste pile without a permit and unapproved transportation of hazardous waste to Taiwan. Anrich ceased operations at the Site in July 1991 and notified FDER shortly thereafter that it had ceased doing business in the United States.

FDEP conducted a site investigation in June 1993 and an expanded site investigation in December 1994. Sampling results confirmed that site activities resulted in the contamination of soil, sediment and ground water with heavy metals. Sampling detected the highest surface soil lead concentrations north of the Battery Recycling Building, south of the plastic pellet plant, in the drainage ditch leading to Highway 71, and in the drainage ditch along Highway 71 (see Appendix J for historical site feature locations). Sampling also detected elevated concentrations of chromium, iron, manganese, nickel and zinc.

The results of the expanded site investigation led to a limited removal action by EPA in 1996. Cleanup activities included the removal and proper disposal of six 55-gallon drums of hazardous waste found on site. EPA also solidified and disposed of several hundred gallons of sulfuric acid sludge discovered in a 6,000-gallon tank on the Site.

EPA placed the Site on the National Priorities List in April 2003 and conducted another removal action at the Site in summer 2006. Activities included the separation of the 2,500-cubic yard waste pile, previously stored in the Materials Storage Building, into soil and debris. EPA disposed of the hazardous waste debris at a hazardous waste landfill and

treated the remaining hazardous soil. Rendered non-hazardous by treatment, EPA disposed of the soil at an off-site landfill. This material represented the principal threat to human health and the environment, and the greatest potential source for ground water contamination.

3.5 Basis for Taking Action

EPA conducted a remedial investigation of the Site in three phases. EPA conducted the primary remedial investigation in June and July 2002, followed by a supplemental remedial investigation in December 2003, and an additional remedial investigation sampling event in March 2005. EPA completed the Site's combined remedial investigation/feasibility study in December 2005.

The Site's risk assessment, which was completed in May 2005 and included in the remedial investigation, identified the former lead battery recycling operation as the primary source of site contamination. The primary release mechanisms were spills and poor housekeeping in the battery processing areas and discharges to the unlined holding ponds (see Appendix J for historical site feature locations). Truck traffic and stormwater runoff spread the contamination throughout the Site, to Highway 71 and the ditches that line it.

The remedial investigation determined that surface soil contamination was generally confined to the facility boundary as defined by the fenceline (the outer fenceline depicted in Figure 2), but there was also contamination west and southwest of the fenceline. The investigation identified lead, antimony and arsenic as the most significant surface soil contaminants. Subsurface soil contamination was less widespread than surface soil contamination. Lead, antimony and arsenic were also the most significant contaminants in the subsurface soils.

The remedial investigation identified lead as the most significant contaminant in site sediments. The highest level of soil/sediment contamination was found in the ditches that border the site access road west of the former operations area. Lesser but significant contamination was found along Highway 71 north and south of the access road and downstream of the drainage ditch that empties into a wetland west of Highway 71.

The remedial investigation determined that ground water contamination appeared to be confined to part of the surficial aquifer immediately downgradient of the battery plant, especially near the unlined waste pond. The investigation found no evidence that contamination had spread to the underlying Floridan Aquifer. The investigation also determined that the two potable water wells on the Site and the six residential wells on properties around the Site were installed in the deeper Floridan Aquifer. Remedial investigation sampling detected several constituents in the potable water samples. However, none exceeded maximum contaminant levels (MCLs). Based on this assessment, EPA determined that the potable ground water wells were not impacted by site contamination.

In 2005, the risk assessment identified visitors and trespassers as the only receptors for potential exposure to surface soil and sediment contamination via ingestion, dermal contact or inhalation of particulates. The risk assessment found no risk of contaminant exposure to workers due to the lack of a worker population in the contaminated area.

Under a future residential redevelopment scenario, EPA found unacceptable risk from exposure to contaminants in site soils and ingestion of drinking water from a future on-site well installed in the surficial aquifer.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP. The nine criteria are:

1. Overall Protection of Human Health and the Environment
2. Compliance with ARARs
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

4.1 Remedy Selection

EPA selected a remedy to address soil, sediment and ground water contamination in the Site's September 2006 Record of Decision (ROD). The ROD listed the following remedial action objectives (RAOs):

Soil and Sediment

- Prevent ingestion, inhalation or direct contact with surface soil that contains concentrations above the remedial goals (RGs).
- Control migration and leaching of contaminants in surface and subsurface soil to ground water that could result in ground water contamination above MCLs or health-based remedial goals.
- Prevent ingestion or inhalation of sediment particulates in air that contain concentrations above the RGs.
- Protect the wetlands environment and its biota from exposure to contaminants above RGs.
- Permanently and/or significantly reduce the mobility/toxicity/volume of hazardous waste with treatment.
- Control future releases of contaminants to ensure protection of human health and the environment.

Ground Water

- Prevent ingestion of ground water with contaminant concentrations above RGs.
- Restore the ground water aquifer system by cleanup to the RGs.
- Prevent migration of pollutants beyond the known contaminant plume or established point of compliance.

- Control future releases of contaminants of concern to ground water to ensure protection of human health and the environment.
- Permanently or significantly reduce the mobility/toxicity/volume of characteristic principal-threat hazardous waste with treatment.

The selected remedy, as stated in the ROD, consisted of:

- Decontamination (as appropriate) and demolition of the Battery Plant and Materials Storage buildings and other site structures and buildings as necessary.
- Recycling of metal debris.
- Excavation and stockpiling of contaminated soil and sediment.
- Ex situ stabilization and solidification of contaminated soil and sediments and possibly concrete building debris.
- Additional excavation necessary to create a sitewide disposal area.
- Backfill of clean soil into areas outside the fenceline where contaminated soil and sediment were removed.
- Compaction and disposal of waste (treated soil/sediment and possibly concrete building debris), assuming a 20 percent increase in soil/sediment volume due to stabilization/solidification into the on-site disposal cell.
- Installation of a geosynthetic clay liner over the treated material in the disposal cell.
- Installation of a 1.5-foot clean soil cover over the disposal site.
- Installation of a 6-inch topsoil cover and grass seeding over the disposal cell and soil/sediment excavation area.
- Restoration of the remediated wetlands.
- Institutional controls to protect the long-term integrity of the monolith, such as a restrictive covenant that limits on-site land use activities to those consistent with the remedy and engineering controls to limit access, such as fencing. Institutional controls will also restrict the installation of irrigation or potable wells in the area of the contaminant plume without the notification and approval of EPA and FDEP.
- Implementation of monitored natural attenuation (MNA) or other ground water monitoring system until the ground water RGs are met. In situ treatment of contaminated ground water via injection of treatment additives at selected monitoring wells may be implemented if 1) ground water contaminants do not decline to concentrations below the State of Florida's Chapter 62-777 Florida Administrative Code natural attenuation default criteria in a reasonable time following completion of the soil remedy; 2) ground water contamination is determined to be migrating past the present known extent of the plume; or 3) the contaminant plume is not attenuating at an acceptable rate of decline or has reached asymptotic levels.

On September 10, 2010, EPA signed an Explanation of Significant Differences (ESD), amending two components of the selected remedy. The ROD stated that the 36 milligrams per kilogram (mg/kg) lead ecological cleanup value was a "not-to-exceed" concentration in the RG table. The ESD clarified that the 36 mg/kg lead concentration is

an average concentration for the purpose of the ecological cleanup, rather than a "not-to-exceed" value. The ESD also provided an explanation for elevated antimony concentrations allowed in the Synthetic Precipitation Leaching Procedure (SPLP) leachate from stabilized/solidified contaminated soil. See section 4.2 for additional information.

The ROD derived site cleanup goals from the human health risk assessment and ARARs. The ROD based soil cleanup goals on a cancer risk of 1×10^{-6} and a non-cancer hazard quotient of 1 using residential exposure assumptions. According to the ROD, soil cleanup goals calculated for protection from direct exposure and ingestion of soil applied to the first two feet of soil. The soil cleanup goals for prevention of contaminants of concern (COCs) leaching to ground water applied to the entire soil column, to the top of the ground water table. The ecological cleanup goals for protection of terrestrial biota from soil and aquatic biota from sediment applied to the top 6 inches of soil and sediment.

The ROD based ground water cleanup goals on federal and state MCLs, and if not available, a cancer risk of 1×10^{-6} and a non-cancer hazard index of 1, using residential exposure assumptions.

Table 2 presents cleanup goals and COCs for soil, sediment and ground water.

Table 2: Soil, Sediment and Ground Water Cleanup Goals

COC	Cleanup Goal[a]	Basis[a]
Soil		
Arsenic	2.1 mg/kg	Direct contact
Iron	23,400 mg/kg	Direct contact
Manganese	3,500 mg/kg	Direct contact
Lead	400 mg/kg	Direct contact
Antimony	31 mg/kg	Direct contact
Lead	400 mg/kg	Migration to ground water
Antimony	5.4 mg/kg	Migration to ground water
Cadmium	7.5 mg/kg	Migration to ground water
Lead	500 mg/kg	Ecological protection
Sediment		
Lead	36 mg/kg	Ecological protection
Ground Water		
Aluminum	15,643 µg/L	HQ = 1
Antimony	6 µg/L	FL MCL
Cadmium	5 µg/L	FL MCL
Iron	4,700 µg/L	HQ = 1
Lead	15 µg/L	FL MCL
Manganese	375 µg/L	HQ = 1
Vanadium	36 µg/L	HQ = 1
Trichloroethene	3 µg/L	FL MCL
a) Cleanup goals as defined in the 2006 ROD mg/kg – Milligrams per kilogram µg/L – Micrograms per liter HQ – Hazard quotient		

4.2 Remedy Implementation

EPA began the Site's remedial design on September 28, 2006, and completed it on September 29, 2008. In August 2009, EPA received $7.4 million through the American Recovery and Reinvestment Act to assist with cleanup costs. Project mobilization began on October 14, 2009, for the site clearing and site preparation work. Mobilization occurred on December 1, 2009, for the decontamination and demolition of the former battery plant and storage building. On February 8, 2010, mobilization began for the full-scale remedial action implementation of soil excavation, cell construction, soil treatment, capping, monitoring well construction and site restoration.

During the remedial action, EPA excavated 43,324 cubic yards of soil and treated about 61,985 tons of soil and sediment. The debris from the screening process was treated with 5 percent Portland cement and sampled for toxicity characteristic leaching procedure (TCLP) metals and SPLP analysis. If samples failed the TCLP analysis, EPA added 2.5 percent Portland cement and re-sampled. Based on the results of the TCLP testing, EPA shipped about 1,215 tons of stabilized debris, considered non-hazardous waste, to an off-site landfill. EPA shipped the remaining 1,890 cubic yards of contaminated debris to a hazardous waste landfill.

EPA performed confirmatory sampling to ensure the treated soil and sediment met the standards set for the stabilization of soil at the Site. After excavation and/or treatment, EPA placed the soil and sediment in a containment cell (monolith).

Antimony was the only metal that consistently failed SPLP testing. Treatability studies indicated that antimony concentrations in leachate from treated soil may exceed the SPLP performance standard (6 µg/L) established in the ROD. EPA determined that finding a soil stabilization formula to lower the antimony concentrations in the leachate was technically infeasible and would compromise the formulation's ability to achieve all other stabilization specifications. EPA explained this variance in the 2010 ESD.

EPA also performed confirmatory sampling in the excavated areas. EPA compared analytical results to RGs for direct contact and migration to ground water. In most locations, results from confirmatory sampling met the cleanup goals. Exceptions included the side walls at the northeast corner and west side of the foundation/concrete slab of the Plastics Building and the northeast corner and east side of the foundation/concrete slab of the Office Building. Following excavation, lead concentrations in those areas still exceeded RGs. According to the September 2011 remedial action report, lead concentrations in those excavated areas ranged from 420 mg/kg to 3,130 mg/kg, which are above the RG of 400 mg/kg. Additional excavation was not considered feasible as it would compromise the integrity of the structures and foundations. Following excavation, those areas were backfilled with clean fill, effectively eliminating the potential exposure pathway for direct contact to the contaminated soil. EPA implemented institutional controls for those areas to prevent potential contaminant exposure. For a detailed description of these institutional controls, see Section 6.3, Institutional Control Review.

The property owner entered into a Declaration of Restrictive Covenants with FDEP on August 22, 2013. The restrictive covenant restricts land and ground water use on the two parcels that make up the Site. See section 6.3 for a detailed discussion of the Site's institutional controls.

Remedial investigation sampling identified the highest wetland sediment lead concentrations (as high as 13,000 mg/kg) in the top six inches of wetland sediment. Based on this finding, the ROD identified truck traffic and surface water runoff from the main operational area of the Site as the likely mechanisms for the spread of contamination to the wetland area. Lead concentrations below the 6-inch depth ranged from 7 mg/kg to 109 mg/kg. The ROD stated that the 36 mg/kg lead ecological cleanup value was a "not-to-exceed" concentration. However, the ESD clarified that the 36 mg/kg lead concentration is an average concentration for the purpose of the ecological cleanup, rather than a "not-to-exceed" value. Therefore, EPA remediated the wetland area across from the Site by removing the top six inches of sediment and backfilling the area with clean topsoil. EPA also re-planted about 500 dogwoods in the wetland area.

EPA installed new monitoring wells at the Site to further characterize the ground water and provide performance monitoring of stabilized soils in the monolith. EPA ground water sampling in October 2010 and May 2011 verified the natural attenuation of the Site's ground water contaminants. Based on these results, EPA determined that the optional in situ ground water treatment included in the ROD was not necessary. Installation of the new monitoring wells and development and sampling of all pre-existing site monitoring wells were the only actions required for construction of the ground water remedy. Ground water monitoring will continue until all cleanup goals have been met for two consecutive years.

EPA performed a pre-final site inspection on October 14, 2010, and a final site inspection on June 21, 2011. FDEP took over operation and maintenance of the soil remedy including the containment cell and monolith on June 21, 2012. Following the completion of remedy construction, EPA issued the Site's Preliminary Close Out Report (PCOR) on September 14, 2011.

4.3 Operation and Maintenance (O&M)

The Site's 2010 O&M Plan (revised in February 2012) establishes the Site's O&M requirements. General components of the remedy addressed in the O&M Plan include:

- Inspection of installed remedial systems and integrity of monitoring wells;
- Maintenance of the installed remedial systems and final cover over the monolith;
- Ground water monitoring for performance and natural attenuation;
- Site security for protection of the remedial systems; and
- Documentation of enforcement of deed restrictions applied to the Site.

Following the completion of soil remediation, EPA's long-term response action (LTRA) contractor, Black & Veatch Special Projects Corp. (Black & Veatch), conducted quarterly ground water monitoring from December 2010 through October 2012, and semi-annual monitoring thereafter.

FDEP's O&M contractor, TetraTech, performs all other site O&M activities. According to quarterly site inspection reports, O&M activities include cap inspections for erosion, settlement and evidence of animal intrusion, as well as inspections of monitoring wells, fencing and vegetation in the restored wetland and ditch areas. TetraTech performs quarterly O&M inspections. The Site's O&M Plan states the specific inspection schedules for each O&M item. FDEP plans to have the cap mowed four times per year, from the spring through the fall. FDEP will adjust the mowing schedule as needed. The site tenant mows the area outside of the cap. FDEP also has a separate "Critical Response" task assignment that it can use to check or respond to the facility after a major storm or hurricane.

The ROD estimated annual O&M costs for the soil and sediment remedy of $23,750 over 30 years. The ROD estimated annual O&M costs for the ground water remedy of $66,200 over 30 years. Table 3 displays LTRA and some O&M costs for the Site between 2010 and 2014. Annual LTRA costs are currently in line with or lower than the estimated costs. The change in ground water monitoring frequency from quarterly to semi-annually provides a significant cost savings, as evidenced by the O&M costs for 2012 and 2013. The quarterly O&M costs for 2014 are $446.

Table 3: Annual O&M Costs

	Annual LTRA Cost	Annual O&M Cost
2010	$100,000	NA
2011	$100,000	NA
2012	$50,000	NA
2013	$50,000	NA
2014	NA	$892[a]

[a] O&M cost for the first half of 2014.
NA – Not available

5.0 Progress Since the Last Five-Year Review

This is the Site's first FYR.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated the FYR in March 2014 and scheduled its completion for October 2014. The EPA remedial project manager (RPM) Joe Alfano led the EPA site review team, which also included the EPA community involvement coordinator L'Tonya Spencer and contractor support provided to EPA by Skeo Solutions. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

In April 2014, EPA published a public notice in the *Jackson County Floridan* newspaper announcing the commencement of the FYR process for the Site, providing contact information for the EPA RPM and CIC and inviting community participation. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. Upon completion of the FYR, EPA will place copies of the document in the designated site repository: Jackson County Public Library at 2929 Green Street, Marianna, Florida 32446.

6.3 Document Review

ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

- Applicable requirements are those cleanup standards, standards of control and other substantive requirements, criteria or limitations promulgated under federal environmental, state environmental or facility siting laws that specifically address a hazardous substance, remedial action, location or other circumstance found at a CERCLA site.

- Relevant and appropriate requirements are those standards that, while not "applicable," address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards more stringent than federal requirements may be applicable or relevant and appropriate.

- To-Be-Considered criteria are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary remedial action. For example, To-Be-Considered criteria may be particularly useful in determining health-based levels where no ARARs exist or in developing the appropriate method for conducting a remedial action.

Chemical-specific ARARs are health- or risk-based numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. These values establish an acceptable amount or concentration of a chemical that may remain in, or discharged to, the ambient environment. Examples of chemical-specific ARARs include maximum contaminant levels (MCLs) under the federal Safe Drinking Water Act and ambient water quality criteria enumerated under the federal Clean Water Act.

Action-specific ARARs are technology- or activity-based requirements or limits on actions taken with respect to a particular hazardous substance. These requirements are triggered by a particular remedial activity, such as discharge of contaminated ground water or in-situ remediation.

Location-specific ARARs are restrictions on hazardous substances or the conduct of the response activities solely based on their location in a special geographic area. Examples include restrictions on activities in wetlands, sensitive habitats and historic places.

Remedial actions are required to comply with the chemical-specific ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Ground Water ARARs
According to the 2006 ROD, the ground water ARARs for the eight ground water COCs are the National Primary Drinking Water Standards and Florida Drinking Water Standards. This FYR compared current federal and Florida MCLs to the 2006 ARARs for the Site's ground water COCs. The ARARs associated with the Site's ground water have not changed since 2006 (Table 4).

Table 4: Previous and Current ARARs for Ground Water COCs

COC[a]	2006 ROD ARARs (µg/L)	Current ARARs (µg/L)[b]	ARAR Changes
Aluminum	NA[c]	NA[c]	NA
Antimony	6	6	None
Cadmium	5	5	None
Iron	NA[c]	NA[c]	NA
Lead	15[d]	15[d]	None
Manganese	NA[c]	NA[c]	NA
Vanadium	NA[c]	NA[c]	NA
Trichloroethene	3	3	None

a) COCs as identified in the Site's 2006 ROD.
b) More stringent of the federal and state MCLs. The source for the National Primary Drinking Water MCLs is http://water.epa.gov/drink/contaminants/ (accessed on 03/17/2014). State standards are based on Florida State Primary Drinking Water MCLs: http://www.dep.state.fl.us/water/drinkingwater/standard.htm (accessed on 03/17/2014).
c) ARAR not identified in ROD. Cleanup goal based on risk.
d) Lead is regulated by a treatment technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. 15 µg/L is the Action Level for lead.

µg/L – Micrograms per liter

Soil and Sediment ARARs

The 2006 ROD did not establish chemical-specific ARARs for the soil or sediment COCs. Action-specific soil and sediment ARARs specified in the 2006 ROD were relevant during the remedy's construction, but are not relevant to the remedy's continued protectiveness. See Section 7.2 for a discussion of soil cleanup goals and any changes in toxicity levels for COCs.

Institutional Control Review

The ROD requires the implementation of land use and ground water use restrictions for the Site. The purpose of these institutional controls is to prevent human exposure to contamination above site cleanup goals and to ensure the long-term integrity of the monolith.

The property owner entered into a Declaration of Restrictive Covenants with FDEP on August 22, 2013. The restrictive covenant states that no one will dig into, excavate or otherwise disturb the capped monolith without first notifying and obtaining approval from EPA and FDEP, and that no one will construct any ground water wells on the restricted portions of the Site or use the shallow ground water for any purpose without receiving written prior approval from EPA and FDEP. EPA based the institutional control boundary for surficial ground water on a November 2011 plume map (Appendix I). The restrictive covenant also established "do not disturb" areas under portions of the former office and plastic pellet plant building foundations. The covenant restricts any activities that could disturb the soil in those areas (Figure 3).

The restrictive covenant applies to the two site parcels owned by Cumbaa Family Trust 1995 (see Figure 3). Surficial ground water contamination above RGs extends across the two site parcels and a third parcel to the north of the Site. FDEP has not enacted a restrictive covenant limiting ground water use on this northern property. Ground water monitoring wells located on the northern property routinely have manganese concentrations above RGs (Appendix F). However, EPA is coordinating with the Northwest Florida Water Management District to restrict future well placement on the northern property. EPA considers this an adequate institutional control for the ground water plume on the northern property.

There are two potable water wells, P-1 and P-2, installed in the Floridan Aquifer on the Site. The Site's remedial investigation determined that these wells were not impacted by site contamination. According to the 2011 remedial action report, ground water use is not restricted for these wells. The 2011 remedial action report also states that the previous site tenant used P-1 for drinking water. According to the Site's remedial investigation report, P-2 is not connected to an electrical power line. P-1 can be used by the current site occupants for potable water. As deep ground water at the Site flows toward the west/southwest, P-1 is immediately downgradient of the capped monolith (Figure 4). EPA sampled both wells repeatedly in 2010. Data indicates that the wells have not been impacted by site-related contamination.

Remedial investigation findings in 2002 determined that residential wells near the Site are installed in the Floridan Aquifer and are not impacted by site contamination. COC concentrations were all below MCLs during remedial investigation sampling of these wells. However, manganese has been consistently detected above RGs in the Floridan Aquifer wells (GWMW14 and GWMW15) since sampling began in 2010. EPA will continue to evaluate manganese in the Floridan Aquifer to determine if additional actions are needed in the future. The nearest residential well is located about 1,600 feet northwest of the Site; the well's pump was previously dismantled and is no longer in use.

In March 2014, Skeo staff conducted research on the Jackson County Clerk's Office website and found the deed restrictive covenant information pertaining to the Site listed in Table 5.

Table 5: Documents from Jackson County Public Records Office

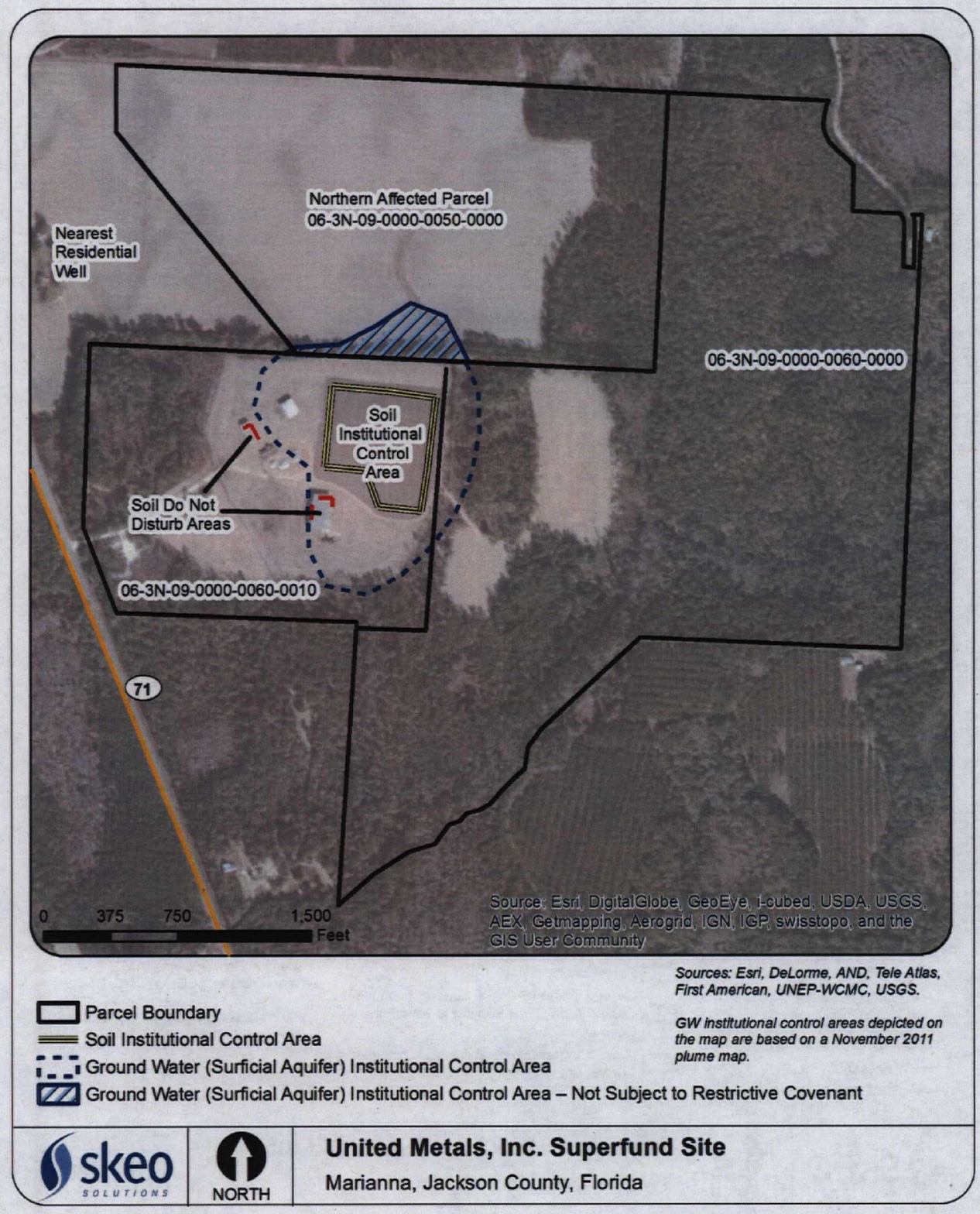
Date	Type of Document	Description	Book #	Page #
04/23/2012	Warranty Deed	Transfer of site property ownership from Faircloth Properties, Inc. to the Cumbaa Family Trust 1995.	1346	0156
02/01/2013	Warranty Deed	Transfer of ownership of the 50-acre site parcel from Harry Cumbaa, as Trustee of the Cumbaa Family Trust 1995, to the Cumbaa Family Trust 1995.	1376	0636
02/01/2013	Warranty Deed	Transfer of ownership of the 125-acre site parcel from Harry Cumbaa, as Trustee of the Cumbaa Family Trust 1995, to the Cumbaa Family Trust 1995.	1376	0637
09/25/2013	Restrictive Covenant	Restrictive covenant between the Cumbaa Family Trust 1995 and FDEP defines shallow ground water and land use restrictions for the two site parcels.	1400	0030

Tables 6 lists the institutional controls associated with areas of interest at the Site.

Table 6: Institutional Control (IC) Summary Table

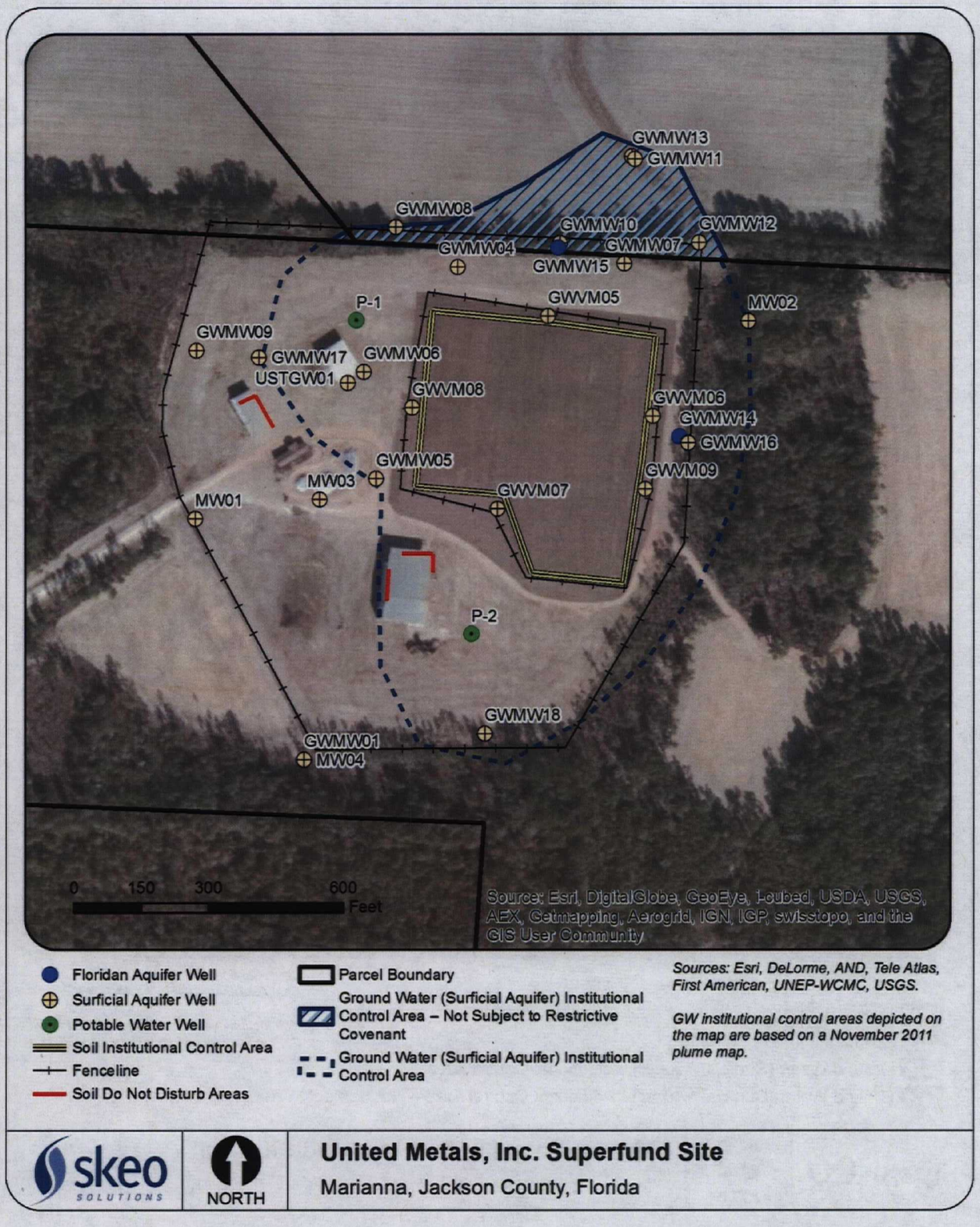
Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place
On-site Parcels					
Shallow Ground Water	Yes	Yes	06-3N-09-0000-0060-0000 06-3N-09-0000-0060-0010	Restrict ground water use and the installation of ground water wells in the surficial aquifer.	August 2013 Restrictive Covenant
Soil/Sediment	Yes	Yes	06-3N-09-0000-0060-0000 06-3N-09-0000-0060-0010	Restrict any activities that could disturb the capped monolith.	August 2013 Restrictive Covenant
Off-site Parcel					
Shallow Ground Water	Yes	Yes	06-3N-09-0000-0050-0000	Restrict ground water use and the installation of ground water wells in the surficial aquifer.	EPA is using a governmental control by coordinating with the Florida Northwest Water Management District to restrict well installation on the property north of the Site.

Figure 3: Institutional Control Base Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 4: Institutional Control Base Map Showing Well Locations



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.4 Data Review

Ground Water

FDEP conducted limited ground water monitoring at the Site in the early 1990s. EPA conducted additional ground water monitoring during the remedial investigation in 2002 and 2003. Regular ground water monitoring at the Site began in 2010 to monitor the effectiveness of the soil remedy.

EPA contractors collected ground water samples from five verification performance monitoring wells (GWVM05 through GWVM09) and 20 additional monitoring wells (MW04/GWMW01, GWMW04 through GWMW18, USTGW01, and MW01 through MW03) (Figure 4). Contractors performed this sampling quarterly between December 2010 and October 2012 and semi-annually thereafter. Samples from shallow wells GWVM05 through GWVM09, located around the monolith, monitor the performance of the containment cell. Initially, EPA analyzed ground water samples for different contaminants based on well type. Beginning in May 2012, all wells were monitored for the same metals. Although trichloroethene (TCE) is a ground water COC, it was eliminated from the sampling program in 2011 because no VOCs had been detected during recent monitoring events. Field measurements were also collected from each well.

For this data review, ground water results were compared to RGs and MNA values (10 times the RG) for seven metals: aluminum, antimony, cadmium, iron, lead, manganese and vanadium.

Verification Performance Monitoring

The five verification wells – all shallow and intermediate ground water wells – are located along the perimeter of the soil monolith (Figure 4). All seven ROD-established COCs exceeded RGs at least once in the five verification performance monitoring wells sampled from October 2010 to August 2013; however, the COCs most frequently detected above cleanup goals were manganese, cadmium and aluminum. Well GWMV08, located immediately west of the soil monolith, reported the highest concentrations of all COCs, except for cadmium in GWVM09 (Table H-1).

COC concentrations in most wells have decreased since initial sampling in October 2010, at the end of the soil remedial action. During the July/August 2013 sampling event, only two COCs exceeded RGs: manganese (16,000 µg/L in GWVM05) and antimony (7.2 µg/L in GWVM06). Manganese in GWVM05 also exceeded the MNA value. Although GWVM08 historically had the highest COC concentrations in verification performance monitoring wells, no COCs exceeded RGs in GWVM08 during the two most recent sampling events in January and July/August 2013(Table H-1). Ground water concentrations are expected to continue to improve because of the soil remedial action and source removals.

An exception to the downward concentration trends was observed for manganese in GWVM05. This well is located along the northern edge of the capped monolith. Manganese concentrations in this well increased from 1,400 µg/L in October 2010 to 16,000 µg/L in August 2013, with a maximum detection of 20,000 µg/L in October 2012.

Additional Ground Water Monitoring

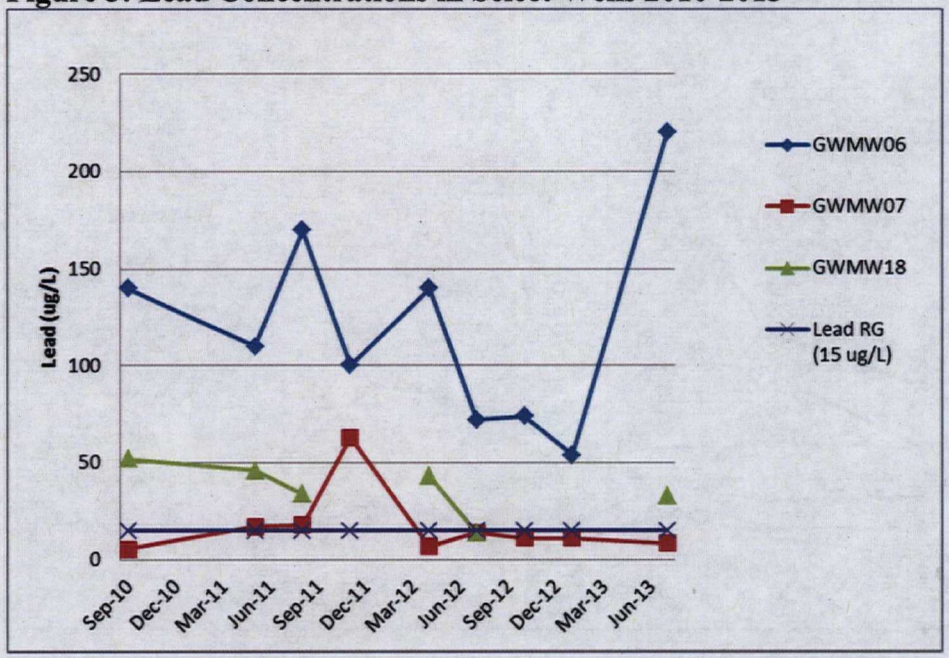
Twenty additional monitoring wells were sampled between September and October 2010 and July 2013. These wells are located on site and off site. Most of these wells monitor the shallow and intermediate aquifers. Two wells (GWMW14 and GWMW15) monitor the upper Floridan Aquifer. Results are presented in Appendix F. The COCs most frequently detected above RGs in the shallow and intermediate depth aquifer wells between 2010 and 2013 were manganese, cadmium, aluminum and lead. Manganese is the only COC detected above RGs in the Floridan Aquifer wells. Wells with the highest COC concentrations and the most consistent detections above RGs (GWMW07 and GWMW04) are located in ground water with low pH (between 3 and 4), which indicates an acidic environment due to past disposal of battery acid (see Table H-2). Well GWMW04 is located immediately north of the capped monolith. Well GWMW07 is located north of the capped area and immediately south of the northern site boundary (Figure 2). The July 2013 Groundwater Implementation Status Report states that the pH is expected to slowly return to normal over time through the natural buffering capacity of the surrounding ground water and soils, but that it may take decades to fully recover.

COC Concentration Trends

To evaluate trends by COC, time series graphs were prepared for aluminum, cadmium, iron, lead, manganese and vanadium in wells that had consistent RG exceedances (Appendix H).

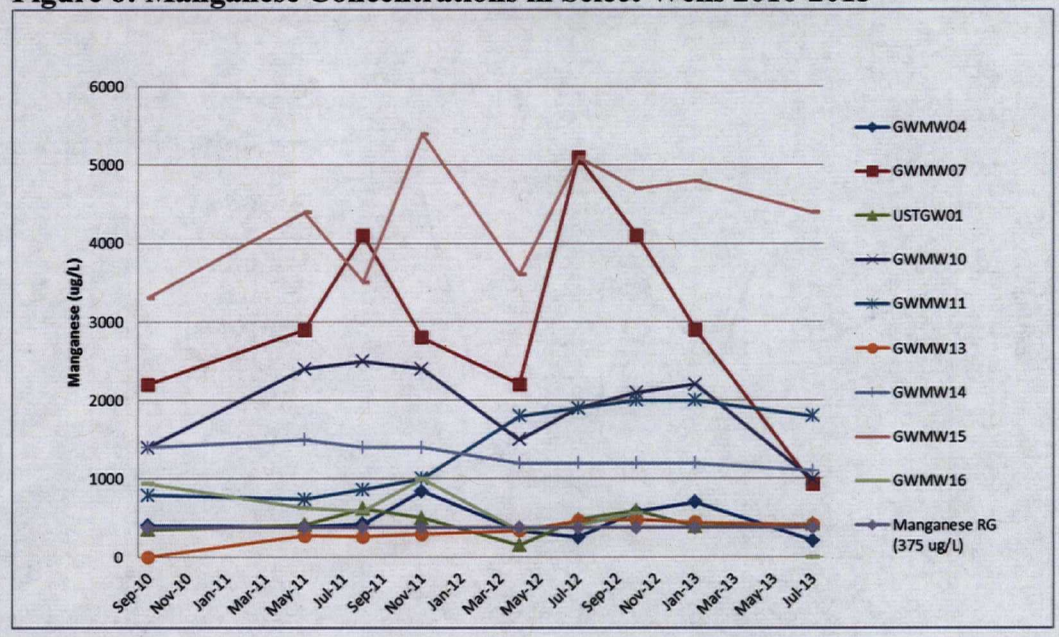
In general, lead concentrations do not show clear trends. However, the data show an increase in lead concentrations in GWMW06 between the January 2013 (54 µg/L) and July/August 2013 (220 µg/L) sampling events (Figure 5). GWMW06 is located immediately downgradient from the capped monolith.

Figure 5: Lead Concentrations in Select Wells 2010-2013



Trends in manganese concentrations vary by well. Some wells have increasing trends (GWMW11, GWMW13, GWMW15), others have decreasing trends (GWMW14) and others have no trends (GWMW07, GWMW10) (Figure 6). Manganese has been consistently detected above RGs in the two Floridan Aquifer wells (GWMW14 and GWMW15) since sampling began in 2010 (Appendix F). While manganese can occur naturally, the 2005 remedial investigation reported non-detectable background manganese concentrations in site ground water from the surficial aquifer. This suggests that elevated ground water manganese concentrations in the surficial aquifer are likely site-related. Elevated concentrations of manganese in the Floridan Aquifer may or may not be site related.

Figure 6: Manganese Concentrations in Select Wells 2010-2013



During the most recent sampling event in July 2013, aluminum, cadmium, lead and manganese were the only COCs detected above RGs. Concentrations of lead in GWMW06 and manganese in Floridan Aquifer well GWMW15 also exceeded their MNA values during the July 2013 sampling event (see Appendix F).

Data Review Summary

In general, ground water quality at the Site has improved since the soil remedial action. However, there are localized areas where COC concentrations have increased and COCs exceed MNA criteria. Highly acidic conditions, such as battery acid, will mobilize metals in soil. Battery acid also contains high concentrations of dissolved metals. In the areas showing elevated and increasing COC concentrations, it is possible that those COCs are leaching from the soil to the ground water due to the acidity of site ground water. However, it is common for COC concentrations in ground water to fluctuate early in the MNA process, but ultimately fall below RGs after time allows for the completion of the attenuation process. Continued monitoring will determine if the elevated and increasing COC concentrations are isolated incidents or may require additional attention.

While data indicate an overall decrease in most COC concentrations at most well locations there have been some exceedances in certain wells that will continue to require attention. In July/August 2013, the northern extent of manganese contamination in the surficial aquifer was north of the northernmost monitoring wells, GWMW11 and GWMW13. Both of those wells recently had manganese concentrations above RGs as did both of the Floridan Aquifer wells (GWMW14 and GWMW15). Well GWMW18 is one of the southernmost monitoring wells at the Site and was not sampled in October 2012 or January 2013. Lead concentrations at that well rose from 14 µg/L in July 2012 to 33 µg/L in July 2013. EPA has determined that the delineation on the southern boundary is adequate and does not require further study. The potentiometric surface indicates that the ground water in the vicinity of GWMW18 flows west toward MW-1. MW-1 does not

have lead above RGs. EPA is also aware of the exceedence of RGs for manganese in the Floridan Aquifer wells and will continue to evaluate if additional Floridan Aquifer wells are needed.

Soil

No new soil data have been collected since implementation of the soil remedy in 2010.

6.5 Site Inspection

On March 27, 2014, Joe Alfano (EPA), Eric Marsh and Claire Marcussen (Skeo Solutions) met with John Sykes (FDEP) and Amber Igoe (TetraTech, FDEP's O&M contractor) at the Site. Joe Alfano and FDEP gave a tour of the Site. The group toured the Site to observe the condition of all remedial components, including site fencing, monitoring wells, the capped area and restored wetland area.

Overall, the Site was well-maintained and the remedy appeared to be in working order. Signs located on fencing throughout the Site clearly marked the presence of a Superfund site. Access to the main former facility area is secured by a locked gate and fence. The capped area is surrounded by another locked gate and fence within the larger fenced area. Site inspection participants observed a small section of damaged fencing around the capped area. One small tree was also observed growing on the cap. The FDEP O&M contractor stated that the tree will be removed during the next mowing.[1] The capped area of the landfill and non-capped area of the Site were well-vegetated. Cap vegetation appeared healthy and well-maintained, with no signs of animal burrowing or surface disruptions. Site inspection participants located and identified all monitoring wells. All wells appeared to be in good condition and were locked at the time of the inspection. Landfill settlement monuments also appeared to be in good condition, with no evidence of cap settlement observed. The remediated wetland area west of the Site and Highway 71 appeared to be in good condition. Wetland vegetation appeared to be healthy. Site inspection participants also observed current land use activities, which include an auto-scrapping and roll-off storage container leasing operation. Scrap vehicles, piles of scrap metal and roll-off containers were observed throughout the Site. The capped area is not in use.

As part of the site inspection, Skeo Solutions staff visited the designated site repository, the Jackson County Public Library, located at 2929 Green Street, in Marianna. No site-related documents were on file at the repository.

Appendix D includes a completed Site Inspection Checklist. Appendix E includes photographs taken during the site inspection.

[1] The site tenant has since repaired the hole in the fence with more wire. FDEP has since had the capped area mowed twice. The saplings are no longer an issue.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the regulatory agencies involved in site activities or aware of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. The interviews are summarized below. Appendix C provides the complete interviews.

Joe Alfano: Joe Alfano is the EPA RPM for the Site. Mr. Alfano submitted his interview responses on April 2, 2014, via email. Overall, Mr. Alfano has a positive impression of the Site, stating that the cleanup was successful and the remedy is being well-maintained and performing as designed. EPA is not aware of any community concerns regarding the remedy's operations or management, or of any adverse effects on the surrounding community. Mr. Alfano also stated that the institutional controls are in place and adequate.

Joe Gunn: Joe Gunn is the representative for EPA's LTRA contractor, Black & Veatch. Mr. Gunn submitted his interview responses on April 2, 2014, via email. Overall, Mr. Gunn has a positive impression of the Site's cleanup, stating the project was very well planned and allowed for reuse of part of the property. The cleanup met the soil cleanup requirements, with the exception of a few areas under existing building foundations, which have been identified in the Restrictive Covenant. Maintenance is low due to cap design and vegetative cover. While there have been no performance assessments to date, Mr. Gunn believes that the stabilized monolith will last for many years if left undisturbed. The ground water contains a few metals above cleanup goals or FDEP Groundwater Cleanup Target Level (GCTL) limits, but overall the trends seem to show improvement in ground water quality. The pH of the ground water will take several years to stabilize and improve. Mr. Gunn stated that the pH of the ground water may be the cause for some of the metals (solubility) in the ground water. He also stated that under normal pH soil conditions, the metals may be less soluble and mobile. No changes have been required from the original ground water monitoring requirements; ground water is now monitored semi-annually.

John Sykes: John Sykes is FDEP's O&M manager for the Site. Mr. Sykes has a good impression of the project overall but is concerned about the reuse of the Site as an auto salvage and roll off storage business. He noted that one nearby resident also expressed concern about how the site is being reused. Mr. Sykes noted that the monolith appears to be performing well. He thought that ground water concentrations would decrease faster, but EPA continues to monitor it. Mr. Sykes requested that FDEP's Northwest District inspect the on-site business, however staff did not note any significant violations of FDEP rules.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions and the site inspection indicate that the remedy is functioning as intended by the site's decision documents. Contaminated soils and sediment were excavated, treated and contained within a capped monolith. Following treatment, soil and sediment were analyzed to make sure they met cleanup goals in the ROD. Confirmatory sampling revealed that contaminant concentrations for treated soil and excavated areas met the Site's cleanup goals at all but a few locations. Soil contamination remains under sections of the foundation/concrete slabs of the former plastics building and office building. However, a restrictive covenant restricts digging and excavation in those areas without prior FDEP/EPA approval to prevent potential contaminant exposure.

The restrictive covenant also restricts the use of ground water from the shallow aquifer for the two on-site parcels and prohibits any activities that could disturb the integrity of the capped monolith without first notifying and obtaining approval from EPA and FDEP. EPA is also coordinating with the Northwest Florida Water Management District to restrict future well placement on the northern property. EPA considers this an adequate institutional control for the ground water plume on the northern property. The cap over the treated soil and sediment prevents potential exposure to COCs in surface soils and sediment with concentrations above appropriate risk levels and helps prevent contaminants from leaching into the shallow ground water below. Additionally, a fence surrounds the capped area, further limiting the potential for exposure to site contaminants.

The on-site potable water well, P-1, is installed in the Floridan Aquifer and can be used by the current site tenant. The Site's remedial investigation determined that the on-site potable ground water wells and the off-site private potable water wells, installed in the Floridan Aquifer, were not impacted by Site contamination. More recent sampling of well P-1 in 2010 did not shown COC concentrations above RGs.

In general, ground water sampling results indicate that ground water quality at the Site has improved since the soil remedial action; this improvement is expected to continue. However, there are localized areas where COC concentrations have increased and areas where COCs still exceed MNA criteria. Continued monitoring of both surficial ground water and the Floridan Aquifer will determine if the elevated and increasing COC concentrations are isolated incidents, or may require additional attention. Data also suggests that the extent of manganese contamination in both the surficial and Floridan aquifers is not fully defined. More information and data is necessary for manganese in the surficial and Floridan aquifers to determine if additional actions are necessary, including monitoring wells and/or institutional controls.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

The exposure assumptions, toxicity data and RAOs used at the time of remedy selection are still valid. All cleanup levels for soil are still valid, except one: antimony. ARARs used at the time of remedy selection are also still valid. The ground water ARARs have not changed for any of the COCs since the 2006 ROD.

The 2006 ROD did not identify vapor intrusion as a site risk. One of the Site's ground water COCs, TCE, may result in vapor intrusion. However, EPA approved the elimination of TCE from the Site's ground water sampling program in 2011 because no VOCs had been detected during recent monitoring events. The lack of detectable VOC concentrations in site ground water indicates that vapor intrusion does not currently pose a risk to human health.

In 2005, the Site's risk assessment concluded that the Site principally posed a threat to visitors and trespassers through potential exposure to surface soil and sediment. The risk assessment found no risk of contaminant exposure to workers due to the lack of a worker population within the extent of contamination. The cap over the treated soil and sediment prevents exposure to COCs in surface soils above appropriate risk levels and helps prevent contaminant leaching into the shallow ground water below. The excavation and treatment of contaminated wetland sediment and its placement in the on-site monolith prevents exposure to sediment above appropriate risk levels.

The soil cleanup goals were established to prevent leaching to ground water and unacceptable cancer or noncancer risks to residents. Because cancer toxicity values became more stringent for arsenic and a noncancer toxicity value is now available, the protectiveness of the cleanup goals established in the ROD was reviewed. To evaluate the effect of the toxicity value changes on the cleanup goals established in the ROD, the cleanup goals were compared to EPA Regional Screening Levels (RSLs) for direct contact and migration to ground water (Tables K-1 and K-2). The analysis indicates that the cleanup goal for arsenic, based on direct contact, remains valid because the level is equivalent to a residential cancer risk of 3.44×10^{-6}, which falls well within EPA's risk management range of 1×10^{-6} to 1×10^{-4}. The equivalent noncancer hazard index of 0.06 is also well below the noncancer hazard index of 1.0.

The ecological cleanup goals, based on the protection of terrestrial biota for soil and aquatic biota for sediment, applied to the top six inches of soil and sediment. The ecological removal action in the wetland area involved the excavation of the top six inches of soil and sediment, thereby meeting the Site's soil and sediment ecologically-based cleanup goals.

The soil cleanup goals were also compared to the residential Florida soil cleanup target levels (SCTLs) for direct contact and migration to ground water. Although the current SCTL for antimony of 27 mg/kg is lower than the cleanup goal of 31 mg/kg, the selected

remedy of treatment and covering of contaminated soil eliminates the direct exposure pathway. Therefore the soil remedy remains protective.

The ROD did not specify the Florida leachability criteria as the Site's RGs for the protection of ground water; however, the RGs are equal to the Florida criteria. EPA's current soil screening levels for the protection of ground water are lower than the ROD's cleanup goals based on COC migration to ground water (Table K-3). The selected remedy of soil treatment and capping helps prevent the leaching of COCs to ground water at levels above ground water cleanup goals. Routine ground water monitoring will determine the remedy's effectiveness.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions and the site inspection indicate that the remedy is functioning as intended by the Site's decision documents. Contaminated soils and sediment were excavated, treated and contained within a capped monolith. Following treatment, soil and sediment were analyzed to make sure they met cleanup goals in the ROD. Soil contamination remains under sections of the foundation/concrete slabs of the former plastics building and office building. However, a restrictive covenant restricts digging and excavation in those areas without prior FDEP/EPA approval to prevent potential contaminant exposure. In general, ground water sampling results indicate that ground water quality at the Site has improved since the soil remedial action; this improvement is expected to continue. Institutional controls restrict any site activities that may disturb the integrity of the capped monolith area and restrict the use of surficial ground water on the Site. Additionally, coordination between EPA and the Northwest Florida Water Management District restricts future well placement on the northern property.

There are localized areas where COC concentrations have increased and areas where COCs still exceed MNA criteria. Continued monitoring of both surficial ground water and the Floridan Aquifer will determine if the elevated and increasing COC concentrations are isolated incidents, or may require additional attention. Data also suggests that the extent of manganese contamination in both the surficial and Floridan aquifers is not fully defined. More information and data is necessary for manganese in the surficial and Floridan aquifers to determine if additional actions are necessary, including monitoring wells and/or institutional controls.

8.0 Issues

Table 7 summarizes the current site issues.

Table 7: Current Site Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
The extent of manganese contamination in surficial ground water is not fully defined.	No	Yes
The extent of manganese contamination in the Floridan Aquifer is not fully defined.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 8 provides recommendations to address the current site issues.

Table 8: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
The extent of manganese contamination in surficial ground water is not fully defined.	Further evaluate manganese in the surficial ground water to determine if additional monitoring wells and institutional controls are needed.	EPA	EPA and State	10/14/2017	No	Yes
The extent of manganese contamination in the Floridan Aquifer is not fully defined.	Further evaluate manganese in the Floridan Aquifer to determine if additional monitoring wells and institutional controls are needed.	EPA	EPA and State	10/14/2017	No	Yes

The following item, though not expected to affect protectiveness, warrants additional follow-up:

- Verify that site information is properly maintained and accessible in the site repository.

10.0 Protectiveness Statement

The remedy at the Site is protective of human health and the environment in the short term. Contaminated soils and sediment were excavated, treated and contained in a capped monolith. The cap prevents potential exposure to COCs in surface soils and sediment and helps prevent contaminants from leaching into the ground water below. Additionally, institutional controls protect the integrity of the monolith and further limit the potential of contaminant exposure by prohibiting digging in areas of remaining soil contamination under building foundations and restricting ground water use. In general, ground water sampling results indicate that ground water quality at the Site has improved since the soil remedial action; this improvement is expected to continue. However, in order for the remedy to be protective in the long term, more information and data is necessary for manganese in the surficial and Floridan aquifers to determine if additional actions are necessary, including monitoring wells and/or institutional controls.

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A: List of Documents Reviewed

CERCLA Information System Site Information accessed from website http://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0400804. Accessed March - April 2014.

Explanation of Significant Differences, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. United States Environmental Protection Agency Region 4. September 10, 2010.

Final (100%) Remedial Design for United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. United States Environmental Protection Agency Region 4. September 2008.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. January 2011.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. May 2011.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. November 2011.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. April 2012.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. July 2012.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. October 2012.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. January 2013.

Groundwater Implementation Status Report, United Metals, Inc., Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. July 2013.

Operations and Maintenance Plan, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch Special Projects Corp. Revision 4, February 2012.

Preliminary Close Out Report, United Metal, Inc. Superfund Site, Marianna, Jackson County, Florida. United States Environmental Protection Agency Region 4. September 14, 2011.

Record of Decision, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. United States Environmental Protection Agency Region 4. September 28, 2006.

Remedial Action Report, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch. Revision 2, September 2011.

Remedial Investigation/Feasibility Study, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by CDM Federal Programs Corporation. December 2005.

Revised Final Baseline Risk Assessment for Human Health, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by CDM Federal Programs Corporation. May 2005.

Site Inspection Report, United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida. Prepared for United States Environmental Protection Agency Region 4 by Black & Veatch. May 2012.

Appendix B: Press Notice

The U.S. Environmental Protection Agency, Region 4 Announces the First Five-Year Review for the United Metals, Inc. Superfund Site, Marianna, Jackson County, Florida

Purpose/Objective: EPA is conducting a Five-Year Review of the remedy for the United Metals, Inc. Superfund site (the Site) in Marianna, Florida. The purpose of the Five-Year Review is to make sure the selected cleanup actions effectively protect human health and the environment.

Site Background: The 180-acre Site is surrounded by farmland, woods and wetlands. The Site includes about 24 acres where a battery reclaiming facility operated from 1979 until 1991. Facility operations included reclaiming lead from batteries, shredding the battery cases and sending the materials off site for further processing. Following the neutralization of liquid battery wastes in concrete basins, site operators discharged the waste to an unlined holding pond. Facility operations contaminated soil, sediment and ground water with various metals, including lead, cadmium and antimony. EPA placed the Site on the Superfund program's National Priorities List (NPL) in April 2003.

Cleanup Actions: EPA selected the Site's remedy in the Site's September 2006 Record of Decision (ROD) and updated the remedy in an Explanation of Significant Differences (ESD) in 2010. The final remedy consisted of monitored natural attenuation (MNA) for contaminated ground water and solidification/stabilization for contaminated soils. The remedy also included a cap for treated soils, removal of contaminated structures and wetlands restoration. EPA completed two short-term cleanups, or removal actions, at the Site in 1996 and 2006. Construction of the long-term remedy started in 2009 and finished in September 2011. The remedy also calls for ground water and land use restrictions. Ground water monitoring is ongoing.

Five-Year Review Schedule: The National Contingency Plan requires review of remedial actions that result in any hazardous substances, pollutants or contaminants remaining at the Site above levels that allow for unlimited use and unrestricted exposure every five years to ensure the protection of human health and the environment. The first Five-Year Review for the Site will be completed by October 2014.

EPA Invites Community Participation in the Five-Year Review Process: EPA is conducting this Five-Year Review to evaluate the effectiveness of the Site's remedy and to ensure that the remedy remains protective of human health and the environment. As part of the Five-Year Review process, EPA staff is available to answer any questions about the Site. Community members who have questions about the Site or the Five-Year Review process, or who would like to participate in a community interview, are asked to contact:

Joseph Alfano, EPA Remedial Project Manager
Phone: (404) 562-8933
Email: alfano.joe@epa.gov

L'Tonya Spencer, EPA Community Involvement Coordinator
Phone: (404) 562-8463 | (877) 718-3752 (toll-free)
Email: spencer.latonya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, GA 30303-8960

Additional site information is available at the Site's local document repository, located at the Jackson County Public Library, 2929 Green Street, Marianna, Florida 32446, and online at: *http://www.epa.gov/region4/superfund/sites/npl/florida/unitmfl.html*.

Appendix C: Interview Forms

United Metals, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: United Metals, Inc. **EPA ID No.:** FLD098924038

Interviewer Name: _____ **Affiliation:** _____

Subject Name: Joe Alfano **Affiliation:** EPA Region 4

Subject Contact Information: 404-858-8726, alfano.joe@epa.gov

Time: _____ **Date:** _____

Interview Location: _____

Interview Format (circle one): In Person Phone Email Other:

Interview Category: EPA Remedial Project Manager

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   The cleanup was successful and the remedy is being well maintained.

2. What have been the effects of this Site on the surrounding community, if any?
   I am not aware of any adverse effects on the surrounding community.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities since the implementation of the cleanup?
   I am not aware of any complaints regarding remedial activities since implementation of the cleanup.

4. What is your assessment of the current performance of the remedy in place at the Site?
   The remedy is performing well.

5. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   The institutional controls are in place and adequate.

6. Are you aware of any community concerns regarding the Site or the operation and management of its remedy? If so, please provide details.
   I am not aware of any community concerns regarding the remedy's operations or management.

7. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?
   No.

United Metals, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: United Metals, Inc. **EPA ID No.:** FLD098924038

Interviewer Name: _____ **Affiliation:** _____

Subject Name: Joe Gunn **Affiliation:** Black & Veatch

Subject Contact Information: 1120 Sanctuary Parkway Suite 200 Alpharetta, Ga 30009

Time: 5:00pm EST **Date:** April 2, 2014

Interview Location: Office

Interview Format (circle one): In Person Phone Email Other:

Interview Category: EPA's LTRA Contractor

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   This was a very well-planned project, met all the soil cleanup requirements except a few areas that may be under existing building foundations (which have been identified in the Restrictive Covenants). Maintenance is low due to cap design and vegetative cover. The site remedy allowed for the reuse of the property with the exception of the monolith area (treated soils).

2. What is your assessment of the current performance of the remedy in place at the Site?
   There have been no performance assessments to date; the stabilized monolith will last for many years if left undisturbed. The performance data taken on the stabilized material daily during production and construction of the monolith met all geotechnical and chemical performance goals established for the project.

3. What are the findings from the ground water monitoring data? What are the key trends in contaminant levels that are being documented over time at the Site?
   The ground water does contain a few metals above goals or FDEP GCTL limits, but overall, the trends seem to show improvement in ground water quality due to the soil remediation efforts and monolith capped area protecting underlying soils and ground water. The pH of the ground water will take several years to stabilize and improve, and may be the cause for some of the metals (solubility) in the ground water. Under normal pH conditions in the soils, the metals may be less soluble and mobile.

4. Have there been any significant changes in ground water monitoring requirements? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and impacts.
   No changes have been required from original ground water monitoring requirements. The first few years were quarterly monitoring; now under semi-annual monitoring.

5. Please describe any additional activities related to the ground water remedy you are performing.
   There are no additional activities planned for the ground water at this time.

6. Have there been opportunities to optimize ground water monitoring or related activities? Please describe changes and any resulting or desired cost savings or improved efficiencies.
   No response.

7. Do you have any additional comments, suggestions or recommendations regarding on-going ground water monitoring or related activities at the Site?
   No response.

United Metals, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: United Metal, Inc. **EPA ID No.:** FLD098924038

Interviewer Name: _____ **Affiliation:** _____

Subject Name: John Sykes **Affiliation:** FDEP

Subject Contact Information: (850) 245-8960 John.Sykes@dep.state.fl.us

Time: 10:15 am **Date:** 6/24/14

Interview Location: via e-mail

Interview Format (circle one): In Person Phone Mail Other: E-mail

Interview Category: State Agency – FDEP

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   Generally good, but concerned about reuse as an auto salvage business & rolloff storage. Will continue to monitor this closely.

2. What is your assessment of the current performance of the remedy in place at the Site?
   Monolith appears to be performing well, but thought that groundwater concentrations would decrease faster. EPA is monitoring this, however.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?
   Some concern from one nearby resident about the reuse as an auto graveyard. No actual complaints.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.
   Aside from routine O&M visits, the one call described in #3, above, and routine communications with EPA and our O&M contractor, no.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?
   No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   Yes. No problems with ICs that I am aware of.

7. Are you aware of any changes in projected land use(s) at the Site?
   Not since auto salvage & rolloff business relocated there.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No. Will continue routine O&M and have requested DEP Northwest District to inspect auto salvage & rolloff business – they did not note any significant violations of DEP rules.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: United Metals, Inc.	**Date of Inspection: 3/27/2014**
Location and Region: Marianna, Florida/EPA Region 4	**EPA ID: FLD098924038**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature: Partly cloudy, 50° F**

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☒ Monitored natural attenuation
- ☐ Ground water containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☒ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** Joe Gunn (Name) | EPA's LTRA Contractor (Black & Veatch) (Title) | 04/02/2014 (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone: email: gunnjf@bv.com

Problems, suggestions ☒ Report attached: Section 6.6 includes summarized interview question responses.

2. **O&M Staff** _____ (Name) | _____ (Title) | mm/dd/yyyy (Date)

Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____

Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

Agency FDEP
Contact John Sykes _____ 6/24/2014 (850) 245-8960
Name Title Date Phone No.
Problems/suggestions ☒ Report attached: Section 6.6 includes summarized interview question responses.

Agency _____
Contact _____Name _____ _____ _____
Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☒ Report attached: Section 6.6 includes summarized interview question responses.

Joe Alfano - EPA's RPM Phone: (404) 858-8726
Submitted interview questions responses via email on April 2, 2014.

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☐ Up to date	☐ N/A
☒ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: FDEP completes quarterly O&M reports.

2. **Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A
☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A

Remarks:_____

3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☐ N/A

Remarks: No settlement was observed during the site inspection.

7. **Ground Water Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: FDEP completes quarterly O&M reports.

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house	☒ Contractor for state
☐ PRP in-house	☐ Contractor for PRP
☐ Federal facility in-house	☐ Contractor for Federal facility

☒ See report. LTRA costs were available and are discussed in section 4.3.

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	
From: mm/dd/yyyy	To: mm/dd/yyyy	_____	☐ Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Site inspection participants observed slight damage to a small part of the cap fence. However, the capped fenced area is within a larger fenced area surrounding the Site.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☒ Location shown on site map ☐ N/A

Remarks: Signs located on fencing throughout the Site clearly marked the presence of a Superfund site. Access to the main former facility area is secured by a locked gate and fence. The capped area is surrounded by another locked gate and fence within the larger fenced area.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: EPA/FDEP

Contact	Joe Alfano	EPA Region 4, RPM	mm/dd/yyyy	(404) 562-8933
	Name	Title	Date	Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: A restrictive covenant restricts the use of ground water from the shallow aquifer on the Site and prohibits any activities that could disturb the integrity of the capped monolith or contaminated soil left in place under building foundations. EPA is also coordinating with the Northwest Florida Water Management District to restrict future well placement on the northern property. EPA considers this an adequate institutional control for the ground water plume on the northern property.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☐ N/A

Remarks: A tenant leases the property for auto-scrapping and as a roll-off storage container operation (they store the roll-off containers on site and lease them).

3. **Land Use Changes Off Site** ☐ N/A

Remarks: There have been no recent off-site land use changes.

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots)	☐ Location shown on site map	☒ Settlement not evident
Arial extent: _____		Depth: _____
Remarks: _____		
2. **Cracks**	☐ Location shown on site map	☒ Cracking not evident
Lengths: _____	Widths: _____	Depths: _____
Remarks: _____		
3. **Erosion**	☐ Location shown on site map	☒ Erosion not evident
Arial extent: _____		Depth: _____
Remarks: _____		
4. **Holes**	☐ Location shown on site map	☒ Holes not evident
Arial extent: _____		Depth: _____
Remarks: _____		
5. **Vegetative Cover**	☒ Grass	☒ Cover properly established
☒ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
Remarks: Site inspection participants observed one small tree growing on the cap. It will be mowed down during the next mowing.		
6. **Alternative Cover** (e.g., armored rock, concrete)		☒ N/A
Remarks: _____		
7. **Bulges**	☐ Location shown on site map	☒ Bulges not evident
Arial extent: _____		Height: _____
Remarks: _____		
8. **Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
☐ Wet areas	☐ Location shown on site map	Arial extent: _____
☐ Ponding	☐ Location shown on site map	Arial extent: _____
☐ Seeps	☐ Location shown on site map	Arial extent: _____
☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
Remarks: _____		
9. **Slope Instability**	☐ Slides	☐ Location shown on site map
☒ No evidence of slope instability		
Arial extent: _____		
Remarks: _____		
B. Benches	☐ Applicable	☒ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

C. Letdown Channels ☐ Applicable ☒ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement

Arial extent: _____ Depth: _____

Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation

Material type:_____ Arial extent: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion

Arial extent: _____ Depth: _____

Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting

Arial extent: _____ Depth: _____

Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions

☐ Location shown on site map Arial extent: _____

Size: _____

Remarks: _____

6. **Excessive Vegetative Growth** Type: _____

☐ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Arial extent: _____

Remarks: _____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents**	☐ Active	☐ Passive	
☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
☐ Evidence of leakage at penetration		☐ Needs maintenance	☒ N/A
Remarks: _____			
2. **Gas Monitoring Probes**			
☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
☐ Evidence of leakage at penetration		☐ Needs maintenance	☒ N/A
Remarks: _____			
3. **Monitoring Wells** (within surface area of landfill)			
☒ Properly secured/locked	☒ Functioning	☒ Routinely sampled	☒ Good condition
☐ Evidence of leakage at penetration		☐ Needs maintenance	☐ N/A
Remarks: _____			
4. **Extraction Wells Leachate**			
☐ Properly secured/locked	☐ Functioning	☐ Routinely sampled	☐ Good condition
☐ Evidence of leakage at penetration		☐ Needs maintenance	☒ N/A
Remarks: _____			
5. **Settlement Monuments**	☒ Located	☐ Routinely surveyed	☐ N/A
Remarks: No indication of settlement observed.			
E. Gas Collection and Treatment	☐ Applicable	☒ N/A	
1. **Gas Treatment Facilities**			
☐ Flaring	☐ Thermal destruction		☐ Collection for reuse
☐ Good condition	☐ Needs maintenance		
Remarks: _____			
2. **Gas Collection Wells, Manifolds and Piping**			
☐ Good condition	☐ Needs maintenance		
Remarks: _____			
3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)			
☐ Good condition	☐ Needs maintenance	☐ N/A	
Remarks: _____			
F. Cover Drainage Layer	☐ Applicable	☒ N/A	
1. **Outlet Pipes Inspected**	☐ Functioning	☐ N/A	
Remarks: _____			
2. **Outlet Rock Inspected**	☐ Functioning	☐ N/A	
Remarks: _____			
G. Detention/Sedimentation Ponds	☐ Applicable	☒ N/A	

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUND WATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Ground Water Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☒ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of ground water treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☒ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☒ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☒ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☒ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☒ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Ground water plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

The remedy at the Site is being implemented as required by the Site's decision documents. Contaminated soils and sediment were excavated, treated and contained in a capped monolith. The cap prevents potential exposure to COCs in surface soils and sediment and helps prevent contaminants from leaching into the ground water below. Additionally, institutional controls protect the integrity of the monolith and further limit the potential of contaminant exposure by prohibiting digging in areas of remaining soil contamination under building foundations and restricting ground water use. In general, ground water sampling results indicate that ground water quality at the Site has improved since the soil remedial action; this improvement is expected to continue. While there are localized areas where ground water COC concentrations have increased and areas where COCs still exceed MNA criteria, continued monitoring will ensure the continued protectiveness of the remedy.

B. Adequacy of O&M

Overall, the site is well maintained. A small section of damaged cap fence needs to be repaired, and a tree growing on the cap needs to be removed. The change in ground water monitoring frequency from quarterly to semi-annually provides a significant cost savings, as evidenced by comparing O&M costs for 2012 and 2013.

C. Early Indicators of Potential Remedy Problems

There are no early indicators of potential remedy problems.

D. Opportunities for Optimization

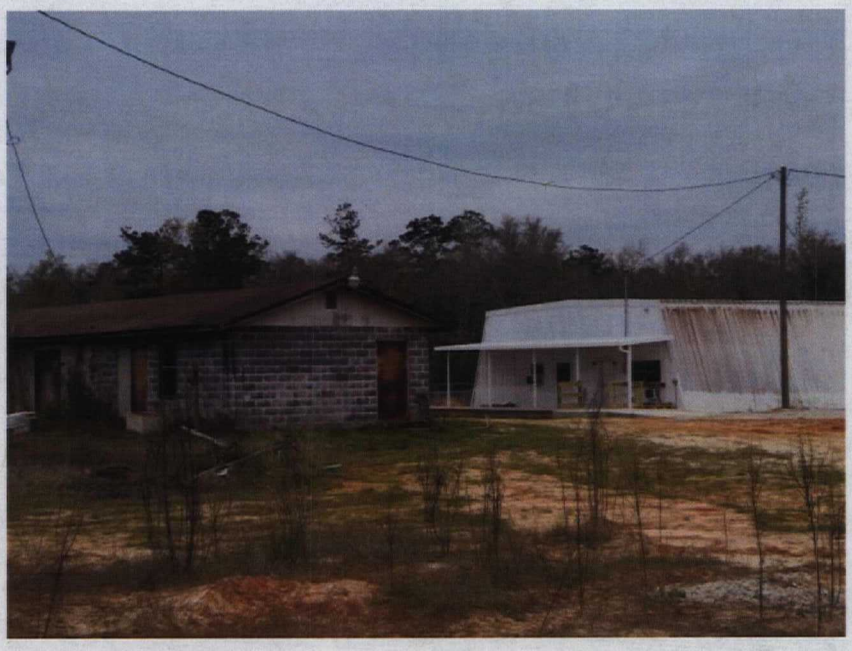
There are no known opportunities for optimization.

Appendix E: Photographs from Site Inspection Visit

Locked gate to enter disposal cell area.

Entrance to site off of Highway 71.

View of vegetated cell, looking north to an agricultural area.



View looking southwest of cell; abandoned building on left and improved office building on right.

Secure monitoring well MW-04/GWMW-01.

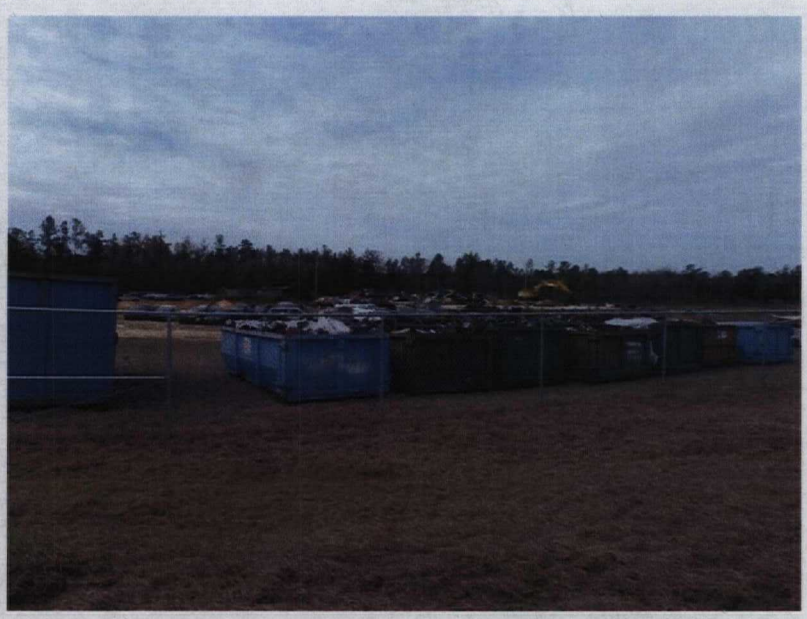
Small damaged section of fence that surrounds the capped area.

View of vegetative cover on cell and one of four settlement markers.

Scrap metal operations on the slab of the former one-story building.

Scrap metal located in southwest corner of the Site.

Junk cars parked outside of capped area.



On-site scrap metal storage.

Borrow area 3 located southwest of the Site, filled with water.

Vegetative cover on the restored wetland.

Appendix F: Ground Water Monitoring Results 2010 – 2013

Table 1-2
Groundwater Quality - Above Remedial Goals
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
	Remedial Goal	15643	6	5	4700	15	375	36
	Laboratory MDLs							
Historical Wells (µg/L)								
MW04 / GWMW01 ** (UMGW01 *)	7/1/2002	340			200			
	12/1/2003				1100		200	
	10/10/2010							
	5/11/2011	170					4.2	
	8/11/2011						3.2	
	11/11/2011							
	4/11/2012	76					8.4	
	7/1/2012						10	
	10/1/2012							
	1/1/2013							
	8/13/2013							
GWMW04 ** (UMGW04 *)	12/1/2003	27000		44	1100		320	
	3/1/2005	46000		64	8800		380	
	9/1/2010	42000		58	8200	4	400	9.8
	5/11/2011	44000		61	15000	9.2	390	6.6
	8/11/2011	40000		60	17000	9.1	420	14
	11/11/2011	95000		130	34000	6.6	840	81
	4/11/2012			61	14000	4.6	340	26
	7/1/2012	28000		32	1300		250	
	10/1/2012	66000		96	30000	7.5	580	100
	1/1/2013	80000		110	27000	5.3	700	140
	7/13/2013	17000		22	1800	7.4	210	6.2
GWMW05 ** (UMGW05 *)	7/1/2002							
	12/1/2003	71			340			
	9/1/2010					1.1		
	5/11/2011	150					3	
	8/11/2011					1.2	3.3	
	11/11/2011							
	4/11/2012	55					4.8	
	7/1/2012							
	10/1/2012					1.6		
	1/1/2013	280			110	1.9		
	7/13/2013					1.5	3.1	
GWMW06 ** (UMGW06 *)	12/1/2003	8300			12000	95	200	
	3/1/2005						31	
	10/10/2010	190			400	140	85	
	5/11/2011	260			120	110	100	
	8/11/2011	320			53	170	88	
	11/11/2011					100	110	2.3
	4/11/2012					140	96	
	7/1/2012					72	79	
	10/1/2012	450			670	74	150	
	1/1/2013				400	54	76	
	7/13/2013					220	140	
GWMW07 ** (UMGW07 *)	12/1/2003	59000	9.2	90	430	7	2600	
	3/1/2005	150000		190		22	4600	
	10/10/2010	32000		42		5.3	2200	
	5/11/2011	89000		130	51	17	2900	
	8/11/2011	120000		190	96	18	4100	
	11/11/2011	91000		300		63	2800	2.4
	4/11/2012	63000	2	78	200	6.8	2200	
	7/1/2012	160000		180		14	5100	
	10/1/2012	130000		140	540	11	4100	
	1/1/2013	91000		100	150	11	2900	
	7/13/2013	11000		16		8.4	930	2

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Groundwater Quality - Above Remedial Goals
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
	Remedial Goal	15643	6	5	4700	15	375	36
	Laboratory MDLs							
Historical Wells - Cont'd. (µg/L)								
GWMW08 (UMGW08)	12/1/2003	120			53		120	
	9/1/2010	480		5			170	
	5/11/2011	450		3.1			99	
	8/11/2011	940		4.3			160	
	11/11/2011	1100		7.8			270	
	4/11/2012	380		3.1			100	
	7/1/2012	630		3.8			130	
	10/1/2012	720		4			140	
	1/1/2013	650		5.8			170	
	8/13/2013	420		3.3			110	
MW-01 ** (MW-1 *)	7/1/2002	180			110		17	
	12/1/2003	39			220		17	
	9/1/2010				100		7.9	
	5/11/2011	230				1.2	12	
	8/11/2011						11	
	11/11/2011							
	4/11/2012	100					14	
	7/1/2012							
	10/1/2012							
	1/1/2013							
	8/13/2013	170					7.5	
MW-02 ** (MW-2 *)	7/1/2002	290			620			
	12/1/2003				1900			
	10/10/2010	180			130			
	5/11/2011	180			82		1.3	
	8/11/2011	240			69		1.4	
	11/11/2011							
	4/11/2012							
	7/1/2012							
	10/1/2012							
	1/1/2013							
	8/13/2013	59						
MW-03 ** (MW-3 *)	7/1/2002	480			1900		140	
	12/1/2003				800			
	9/1/2010	120			2600	1.6	100	
	5/11/2011	150			72		32	
	8/11/2011				73		32	
	11/11/2011						34	
	4/11/2012			1.1			54	
	7/1/2012						56	
	10/1/2012			0.61	100		42	
	1/1/2013						21	
	8/13/2013						15	
USTGW01 ** (UST-01 *)	7/1/2002	550		1.5	3000	440		
	12/1/2003	1100			2100	1000		
	9/1/2010	550		1.5	880	1.2	350	
	5/11/2011	410					410	
	8/11/2011	680		2	180		620	5
	11/11/2011			2.2			500	
	4/11/2012			0.88	220		150	
	7/1/2012	240				4	480	
	10/1/2012	430		1.9	420	1.3	590	
	1/1/2013			1.3	250		390	
	7/13/2013	460		2.3	120		420	1.8

Table 1-2
Groundwater Quality - Above Remedial Goals
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United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
	Remedial Goal	15643	6	5	4700	15	375	36
	Laboratory MDLs							
Historical Wells - Cont'd. (µg/L)								
GWMW09 ** (UMGW09 *)	12/1/2003		270			19		
	9/1/2010							
	5/11/2011					0.98	2.7	
	8/11/2011						2.4	
	11/11/2011							2.3
	4/11/2012					9.6	1.9	
	7/1/2012							
	10/1/2012							
	1/1/2013					1.1		
	7/13/2013							
New Wells (µg/L)								
GWMW10	10/1/2010			13			1400	
	5/11/2011	16000		17	360		2400	
	8/11/2011	17000		13	81	5.7	2500	
	11/11/2011	15000		20			2400	
	4/11/2012	11000		11	350	2.6	1500	
	7/1/2012	16000		10		3.8	1900	
	10/1/2012	16000		11	300	4.1	2100	
	1/1/2013	19000		21	450	4.1	2200	
	7/13/2013	7500		4	2600	2.4	990	
GWMW11	10/1/2010						790	
	5/11/2011	340					740	
	8/11/2011	350					860	
	11/11/2011			1.2			1000	
	4/11/2012	350		2			1800	
	7/1/2012	290					1900	
	10/1/2012	230		2.6			2000	
	1/1/2013			2.5			2000	
	8/13/2013	220		2.5			1800	
GWMW12	10/1/2010							
	5/11/2011			2.8			130	
	8/11/2011	280		3.6			120	
	11/11/2011			5.5			150	
	4/11/2012	68		2.4			73	
	7/1/2012			3.1			87	
	10/1/2012			2.8			96	
	1/1/2013	320		3.4	110		100	
	7/30/2013			2.7			78	
GWMW13	9/1/2010							
	5/11/2011						270	
	8/11/2011	320			81		260	
	11/11/2011			0.45			290	
	4/11/2012	68					340	
	7/1/2012						460	
	10/1/2012	160			160		480	
	1/1/2013						440	
	8/13/2013	64					410	
GWMW14	10/1/2010						1400	
	5/11/2011	280		1.3	62	8.8	1500	
	8/11/2011			2.3		5.5	1400	
	11/11/2011			2.9			1400	5.9
	4/11/2012			2.3			1200	
	7/1/2012			3.1	2400		1200	
	10/1/2012			3.3			1200	
	1/1/2013			3			1200	
	7/13/2013			2.8			1100	

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United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
	Remedial Goal	15643	6	5	4700	15	375	36
	Laboratory MDLs							
New Wells - Cont'd. (µg/L)								
GWMW15	10/1/2010						3300	
	5/11/2011	330					4400	
	8/11/2011				77	5.8	3500	
	11/11/2011			0.45			5400	12
	4/11/2012						3600	
	7/1/2012				2500		5100	
	10/1/2012			0.5			4700	
	1/1/2013						4800	
	7/13/2013					1.3	4400	3.5
GWMW16	10/1/2010						940	
	5/11/2011	3700		1.3	120		630	
	8/11/2011	4400			220	2.3	580	
	11/11/2011	6400		2.6			1000	
	4/11/2012	2400				2	340	
	7/1/2012	3800					410	
	10/1/2012	5200		1.7	100	3.2	560	
	1/1/2013							
	7/13/2013							
GWMW17	9/1/2010							
	5/11/2011				100		71	
	8/11/2011	260				4.9	130	
	11/11/2011							
	4/11/2012					7.3	55	
	7/1/2012						43	
	10/1/2012					2.1	48	
	1/1/2013							
	7/13/2013					4.3	36	
GWMW18	10/1/2010					52	380	
	5/11/2011	240			850	46	370	
	8/11/2011	290			2500	34	690	
	11/11/2011							
	4/11/2012	110			530	43	130	
	7/1/2012				1500	14	220	
	10/1/2012							
	1/1/2013							
	7/13/2013	240			290	33	110	3.7
GWVM05	10/1/2010			8.9		26	1400	
	5/11/2011	13000		10	490	34	2700	
	8/11/2011	1300			130	4.3	5400	
	11/11/2011							
	4/11/2012	1200		5.3	1100		6000	
	7/1/2012	4900		8	530	7.2	2600	
	10/1/2012						20000	
	1/1/2013						14000	
	8/13/2013						16000	
GWVM06	10/1/2010	140000					26000	
	5/11/2011	23000		2.4	280	10	3700	
	8/11/2011	4000			68	4.3	2700	
	11/11/2011	47000		11	3900	16	5800	12
	4/11/2012	5400					1500	
	7/1/2012	30000		4.3	490	5.1	3500	
	10/1/2012	37000		8.4	1200	5.4	4100	
	1/1/2013							
	8/13/2013	140	7.2				220	

Table 1-2
Groundwater Quality - Above Remedial Goals
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
	Remedial Goal	15643	6	5	4700	15	375	36
	Laboratory MDLs							
New Wells - Cont'd. (µg/L)								
GWVM07	10/1/2010						550	
	5/11/2011	140					5.7	
	8/11/2011	200					4.5	
	11/11/2011			1.9			75	2.1
	4/11/2012							
	7/1/2012			3.2			160	
	10/1/2012	120		5.1		1.2	290	
	1/1/2013			2.2			81	
	8/13/2013							
GWVM08	10/1/2010	110000		21	340000	86	22000	94
	5/11/2011	100000		62	550000	90	29000	18
	8/11/2011	140000	12	2.9	350000	110	22000	19
	11/11/2011	76000		44	260000	200	11000	90
	4/11/2012	56000		38	130000	39	7200	39
	7/1/2012	72000		36	140000	55	12000	10
	10/1/2012	29000		16	38000	14	3300	
	1/1/2013			2.2	260		160	
	8/13/2013			3.9			170	
GWVM09	10/1/2010	28000		72			2900	
	5/11/2011	1400		8.1		3	400	
	8/11/2011	2600		11		4.2	640	
	11/11/2011							
	4/11/2012	360		3.5		12	160	
	7/1/2012	1400		7.7			400	
	10/1/2012	1900		7.6	170	1.2	400	
	1/1/2013							
	8/13/2013	260		0.75			50	

Notes:
blank cell = below detection limit
µg/L = micrograms per liter
* Well identification numbers for 2002, 2003, and 2005.
** Current well identification numbers in database.

Represents Exceedance of Remedial Goals.
Represents Exceedance of MDLs.
No measurable amount of water in well. No sample collected

MDL = method detection limits
EPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

Table 1-3
Groundwater Quality - Monitored Natural Attenuation
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
Monitored Natural Attenuation		156430	60	50	47000	150	3750	360
Laboratory MDLs								
Historical Wells (µg/L)								
MW04 / GWMW01 ** (UMGW01 *)	Jul-02	340			200			
	Dec-03				1,100		200	
	Oct-10							
	May-11	170					4	
	Aug-11						3	
	Nov-11							
	Apr-12	76					8	
	Jul-12						10	
	Oct-12							
	Jan-13							
	Aug-13							
GWMW04 ** (UMGW04 *)	Dec-03	27,000		44	1,100		320	
	Mar-05	46,000		64	8,800		380	
	Sep-10	42,000		58	8,200	4	400	9.8
	May-11	44,000		61	15,000	9.2	390	6.6
	Aug-11	40,000		60	17,000	9.1	420	14
	Nov-11	95,000		130	34,000	6.6	840	81
	Apr-12			61	14,000	4.6	340	26
	Jul-12	28,000		32	1,300		250	
	Oct-12	66,000		96	30,000	7.5	580	100
	Jan-13	80,000		110	27,000	5.3	700	140
	Jul-13	17,000		22	1,800	1.5	210	6.2
GWMW05 ** (UMGW05 *)	Jul-02							
	Dec-03	71			340			
	Sep-10					1.1		
	May-11	150					3	
	Aug-11					1.2	3.3	
	Nov-11							
	Apr-12	55					4.8	
	Jul-12							
	Oct-12					1.6		
	Jan-13	280			110	1.9		
	Jul-13					1.5	3.1	
GWMW06 ** (UMGW06 *)	Dec-03	8,300			12,000	95	200	
	Mar-05						31	
	Oct-10	190			400	140	85	
	May-11	260			120	110	100	
	Aug-11	320			53	170	88	
	Nov-11					100	110	2.3
	Apr-12					140	96	
	Jul-12					72	79	
	Oct-12	450			670	74	150	
	Jan-13				400	54	76	
	Jul-13					220	140	
GWMW07 ** (UMGW07 *)	Dec-03	59,000	9.2	90	430	7	2,600	
	Mar-05	150,000		190		22	4,600	
	Oct-10	32,000		42		5.3	2,200	
	May-11	88,000		130	51	17	2,900	
	Aug-11	120,000		190	96	18	4,100	
	Nov-11	91,000		300		63	280	2.4
	Apr-12	63,000	2	78	200	6.8	2,200	
	Jul-12	160,000		180		14	5,100	
	Oct-12	130,000		140	540	11	4,100	
	Jan-13	91,000		100	150	11	2,900	
	Jul-13	11,000		16		8.4	930	2
GWMW08 (UMGW08)	Dec-03	120			53		120	
	Sep-10	480		5			170	
	May-11	450		3.1			99	
	Aug-11	940		4			160	
	Nov-11	1,100		7.8			270	
	Apr-12	380		3.1			100	
	Jul-12	630		3.8			130	
	Oct-12	720		4			140	
	Jan-13	650		5.8			170	
	Aug-13	420		3.3			110	

Table 1-3
Groundwater Quality - Monitored Natural Attenuation
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
Monitored Natural Attenuation		156430	60	50	47000	150	3750	360
Laboratory MDLs								
Historical Wells - Cont'd. (µg/L)								
MW-01 ** (MW-1 *)	Jul-02	180			110		17	
	Dec-03	39			220		17	
	Sep-10				100		7.9	
	May-11	230				1.2	12	
	Aug-11						11	
	Nov-11							
	Apr-12	100					14	
	Jul-12							
	Oct-12							
	Jan-13							
	Aug-13	170					7.5	
MW-02 ** (MW-2 *)	Jul-02	290			620			
	Dec-03				1,900			
	Oct-10	180			130			
	May-11	180			82		1	
	Aug-11	240			69		1	
	Nov-11							
	Apr-12							
	Jul-12							
	Oct-12							
	Jan-13							
	Aug-13	59						
MW-03 ** (MW-3 *)	Jul-02	480			1,900		140	
	Dec-03				800			
	Sep-10	120			2,600	1.6	100	
	May-11	150			72		32	
	Aug-11				73		32	
	Nov-11						34	
	Apr-12			1.1			54	
	Jul-12						56	
	Oct-12			0.61	100		42	
	Jan-13						21	
	Aug-13						15	
USTGW01 ** (UST-01 *)	Jul-02	550		1.5	3,000	440		
	Dec-03	1,100			2,100	1,000		
	Sep-10	550		1.5	880	1.2	350	
	May-11	410					410	
	Aug-11	680		2	180		620	
	Nov-11			2.2			500	
	Apr-12			0.88	220		150	
	Jul-12	240				4	480	
	Oct-12	430		1.9	420	1.3	590	
	Jan-13			1.3	250		390	
	Jul-13	460		2.3	120		420	1.8

Table 1-3
Groundwater Quality - Monitored Natural Attenuation
Historical Comparison to Current Data January 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
Monitored Natural Attenuation		156430	60	50	47000	150	3750	360
Laboratory MDLs								
New Wells (µg/L)								
GWMW09 ** (UMGW09 *)	Dec-03		270			19		120
	Sep-10							
	May-11					0.98	2.7	
	Aug-11						2.4	
	Nov-11							2.3
	Apr-12					9.6	1.9	
	Jul-12							
	Oct-12							
	Jan-13					1.1		
	Jul-13							
GWMW10	Oct-10			13			1,400	
	May-11	16,000		17	360		2,400	
	Aug-11	17,000		13	81	6	2,500	
	Nov-11	15,000		20			2,400	
	Apr-12	11,000		11	350	2.6	1,500	
	Jul-12	16,000		10		3.8	1,900	
	Oct-12	16,000		11	300	4.1	2,100	
	Jan-13	19,000		21	450	4.1	2,200	
	Jul-13	7,500		4	2,600	2.4	990	
GWMW11	Oct-10						790	
	May-11	340					740	
	Aug-11	350					860	
	Nov-11			1.2			1,000	
	Apr-12	350		2			1,800	
	Jul-12	290					1,900	
	Oct-12	230		2.6			2,000	
	Jan-13			2.5			2,000	
	Aug-13	220		2.5			1,800	
GWMW12	Oct-10							
	May-11			2.8			130	
	Aug-11	280		3.6			120	
	Nov-11			5.5			150	
	Apr-12	68		2.4			73	
	Jul-12			3.1			87	
	Oct-12			2.8			96	
	Jan-13	320		3.4	110		100	
	Jul-13			2.7			78	
GWMW13	Sep-10							
	May-11						270	
	Aug-11	320			81		260	
	Nov-11			0			290	
	Apr-12	68					340	
	Jul-12						460	
	Oct-12	160			160		480	
	Jan-13						440	
	Aug-13	64					410	

Table 1-3
Groundwater Quality - Monitored Natural Attenuation
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

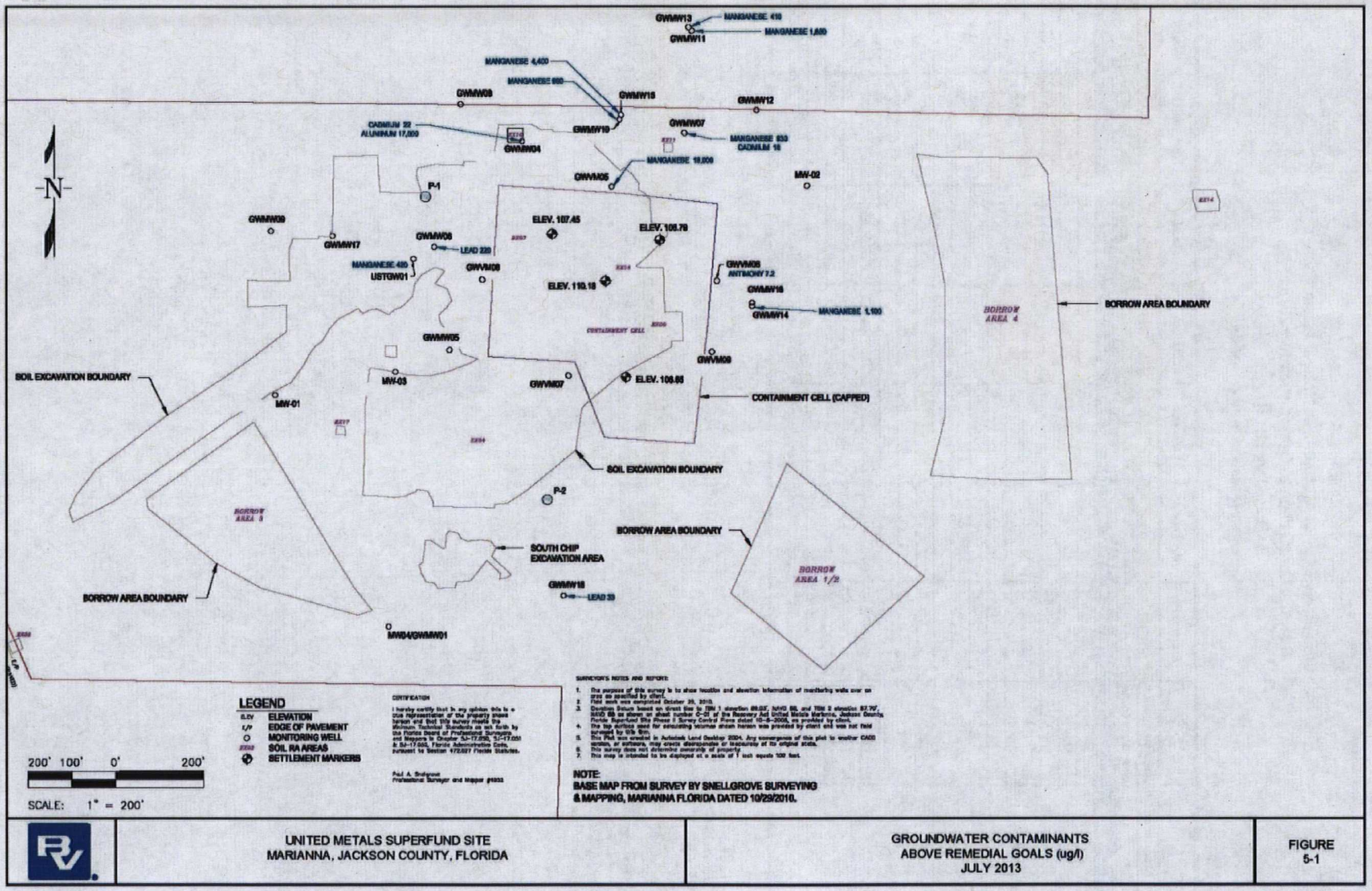
Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
Monitored Natural Attenuation		156430	60	50	47000	150	3750	360
Laboratory MDLs								
New Wells - Cont'd. (µg/L)								
GWMW14	Oct-10						1,400	
	May-11	280		1.3	62	9	1,500	
	Aug-11			2		6	1,400	
	Nov-11			3			1,400	
	Apr-12			2.3			1,200	
	Jul-12			3.1	2,400		1,200	
	Oct-12			3.3			1,200	
	Jan-13			3			1,200	
	Jul-13			2.8			1,100	
GWMW15	Oct-10						3,300	
	May-11	330					4,400	
	Aug-11				77	5.8	3,500	
	Nov-11			0.45			5,400	
	Apr-12						3,600	
	Jul-12				2,500		5,100	
	Oct-12			0.5			4,700	
	Jan-13						4,800	
	Jul-13					1.3	4,400	3.5
GWMW16	Oct-10						940	
	May-11	3,700		1.3	120		630	
	Aug-11	4,400			220	2.3	580	
	Nov-11	6,400		2.6			1,000	
	Apr-12	2,400				2	340	
	Jul-12	3,800					410	
	Oct-12	5,200		1.7	100	3.2	560	
	Jan-13							
	Jul-13	3,100		1.2		1.8	310	
GWMW17	Sep-10							
	May-11				100		71	
	Aug-11	260				5	130	
	Nov-11							
	Apr-12					7.3	55	
	Jul-12						43	
	Oct-12					2.1	48	
	Jan-13							
	Jul-13					4.3	36	
GWMW18	Oct-10					52	380	
	May-11	240			850	46	370	
	Aug-11	290			2,500	34	690	
	Nov-11							
	Apr-12	110			530	43	130	
	Jul-12				1,500	14	220	
	Oct-12							
	Jan-13							
	Jul-13	240			290	33	110	3.7
GWVM05	Oct-10			8.9		26	1,400	
	May-11	13,000		10	490	34	2,700	
	Aug-11	1,300			130	4.3	5,400	
	Nov-11							
	Apr-12	120		5.3	1,100		6,000	
	Jul-12	4,900		8	530	7.2	2,600	
	Oct-12						20,000	
	Jan-13						14,000	
	Aug-13						16,000	
GWVM06	Oct-10	140,000					26,000	
	May-11	23,000		2.4	280	10	3,700	
	Aug-11	4,000			68	4.3	2,700	
	Nov-11	47,000		11	3,900	16	580	12
	Apr-12	5,400					1,500	
	Jul-12	30,000		4.3	490	5.1	3,500	
	Oct-12	37,000		8.4	1,200	5.4	4,100	
	Jan-13							
	Aug-13	140	7.2				220	
GWVM07	Oct-10						550	
	May-11	140					6	
	Aug-11	200					5	
	Nov-11			2			75	2
	Apr-12							
	Jul-12			3			160	
	Oct-12	120		5		1	290	
	Jan-13			2			81	
	Aug-13							

Table 1-3
Groundwater Quality - Monitored Natural Attenuation
Historical Comparison to Current Data July 2013
United Metals Site
Marianna, Jackson County, Florida

Sample Location	Sample Date	Aluminum	Antimony	Cadmium	Iron	Lead	Manganese	Vanadium
Monitored Natural Attenuation		156430	60	50	47000	150	3750	360
Laboratory MDLs								
New Wells - Cont'd. (µg/L)								
GWVM08	Oct-10	110,000		21	340,000	86	22,000	94
	May-11	100,000		62	550,000	90	29,000	18
	Aug-11	140,000	12	3	350,000	110	22,000	
	Nov-11	76,000		44	260,000	200	11,000	90
	Apr-12	56,000		38	130,000	39	7,200	39
	Jul-12	72,000		36	140,000	55	12,000	10
	Oct-12	29,000		16	38,000	14	3,300	
	Jan-13			2.2	260		160	
	Aug-13			3.9			170	
GWVM09	Oct-10	28000		72			2,900	
	May-11	1400		8.1		3	400	
	Aug-11	2600		11		4.2	640	
	Nov-11							
	Apr-12	360		3.5		12	160	
	Jul-12	1400		7.7			400	
	Oct-12	1900		7.6	170	1.2	400	
	Jan-13							
	Aug-13	260		0.75			50	

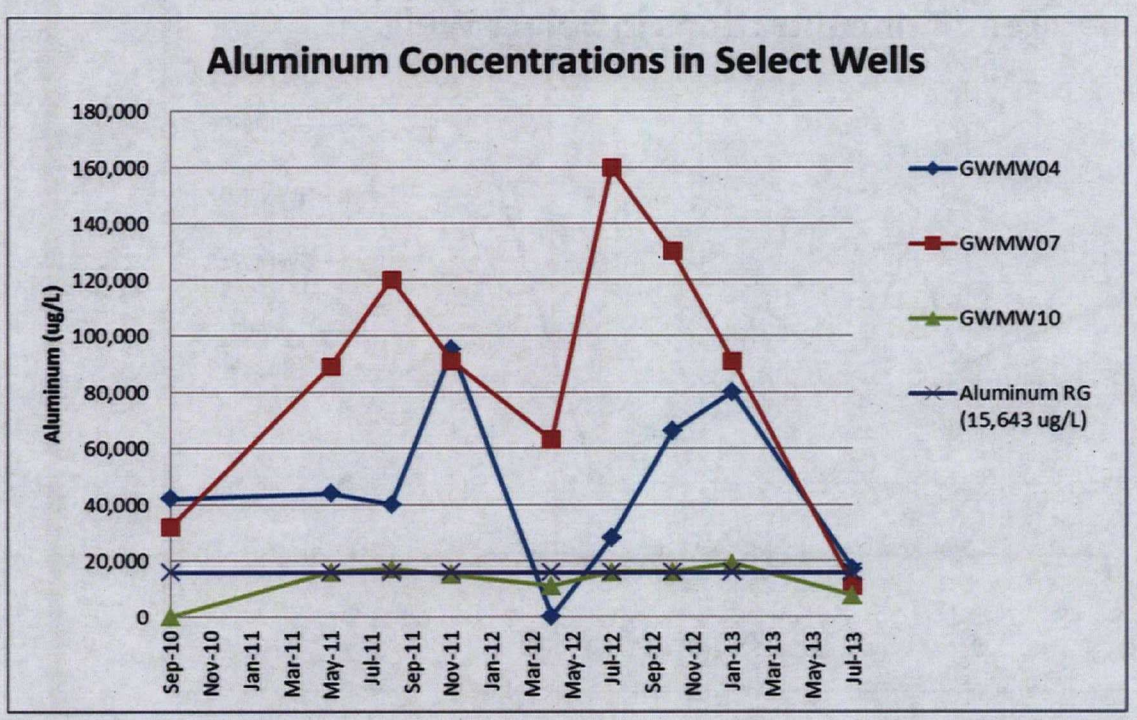
Notes:
blank cell = below detection limit
µg/L = micrograms per liter
* Well identification numbers for 2002, 2003, and 2005.
** Current well identification numbers in database.
Represents Exceedance of 10 times the Remedial Goals.
Represents Exceedance of MDLs.
No measurable amount of water in well. No sample collected
MDL = method detection limits
EPA = U.S. Environmental Protection Agency
FDEP = Florida Department of Environmental Protection

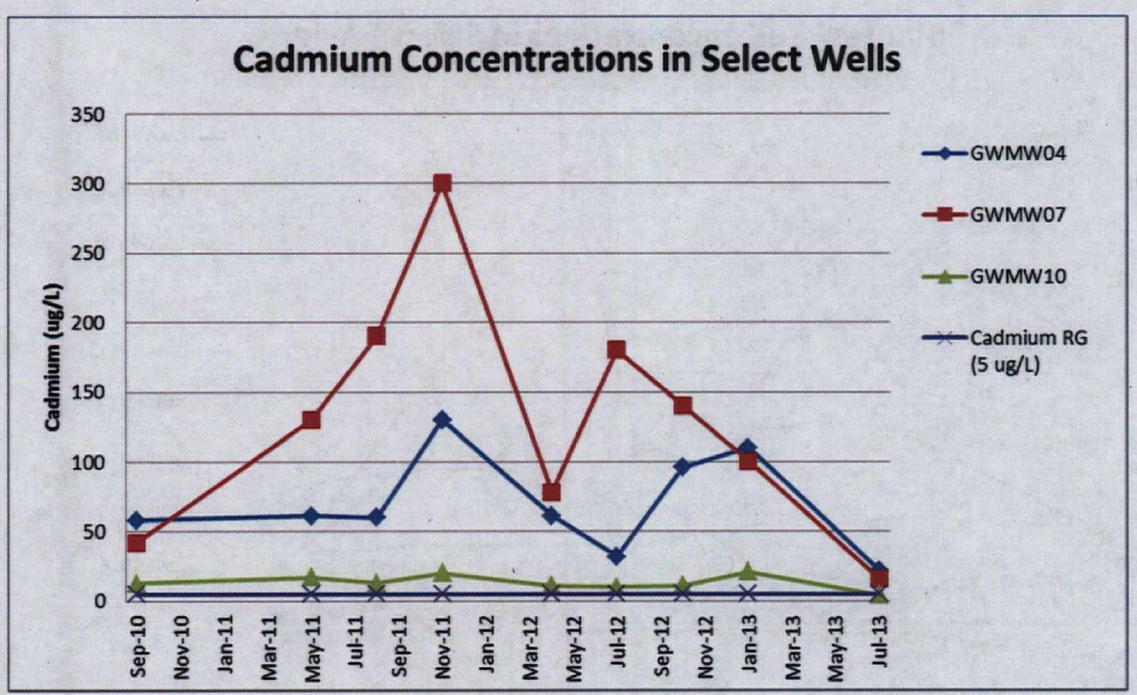
Appendix G: Ground Water Contaminants Above RGs: July 2013

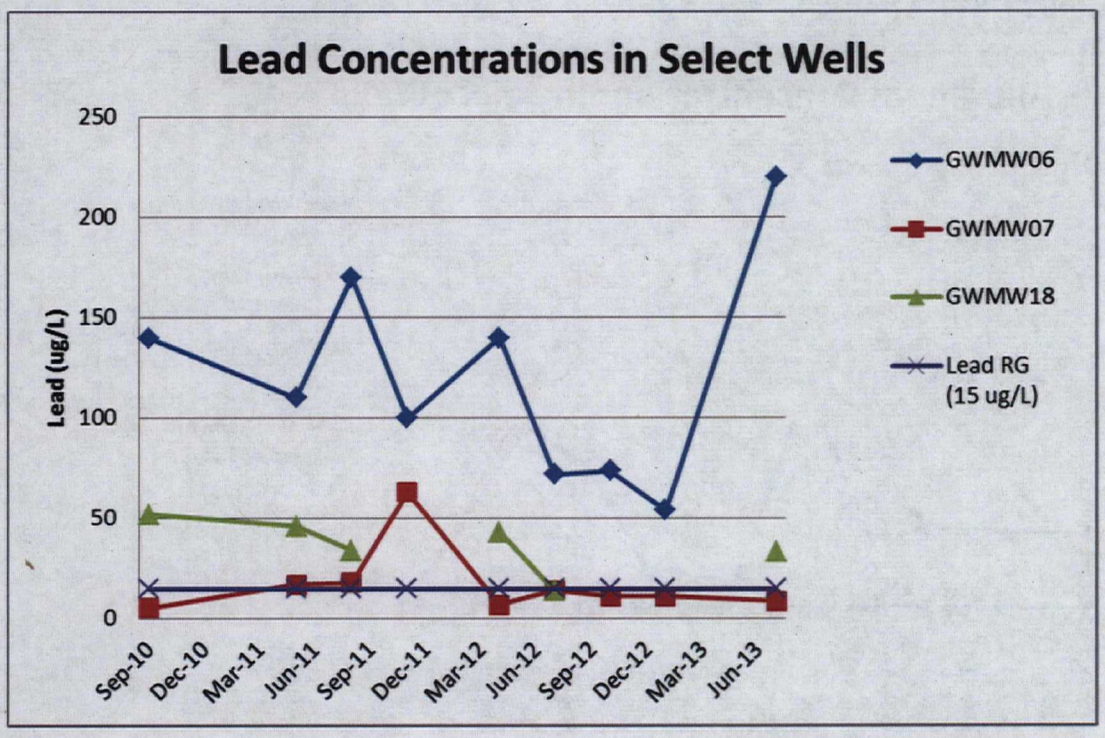


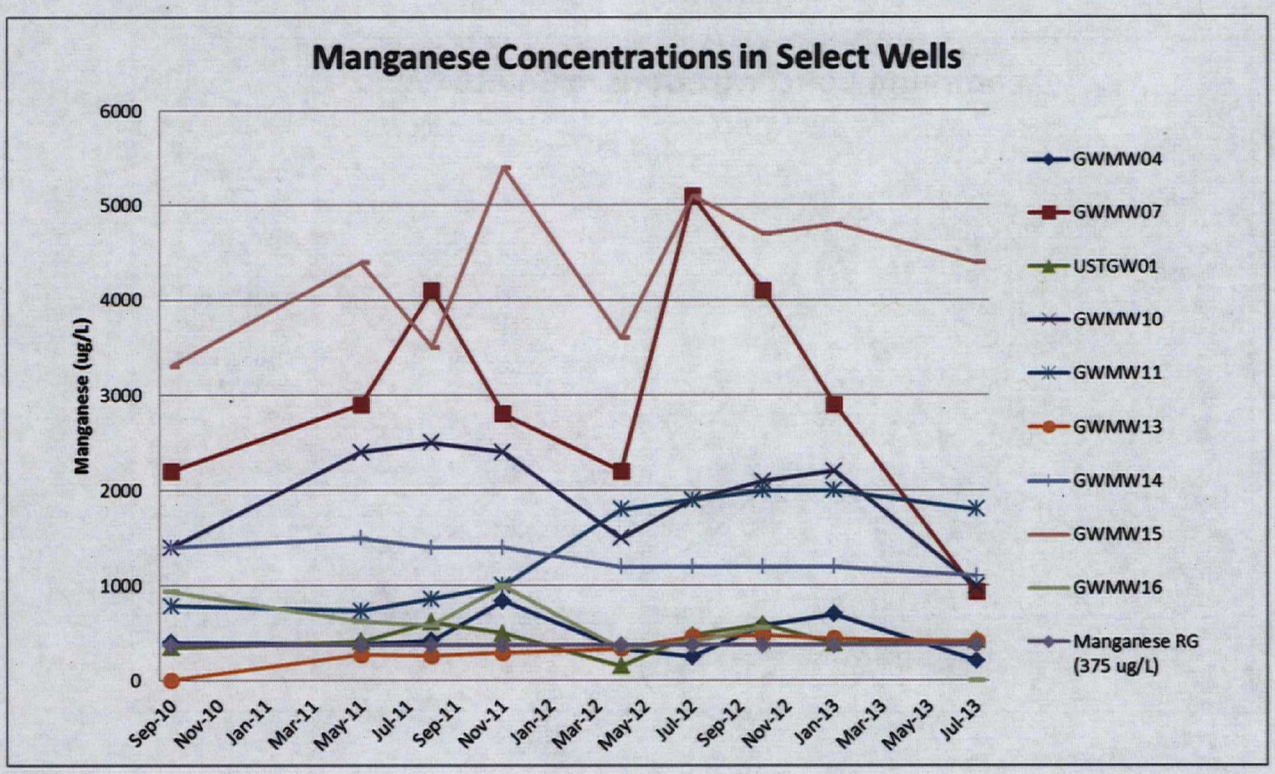
RV	UNITED METALS SUPERFUND SITE MARIANNA, JACKSON COUNTY, FLORIDA	GROUNDWATER CONTAMINANTS ABOVE REMEDIAL GOALS (ug/l) JULY 2013	FIGURE 5-1

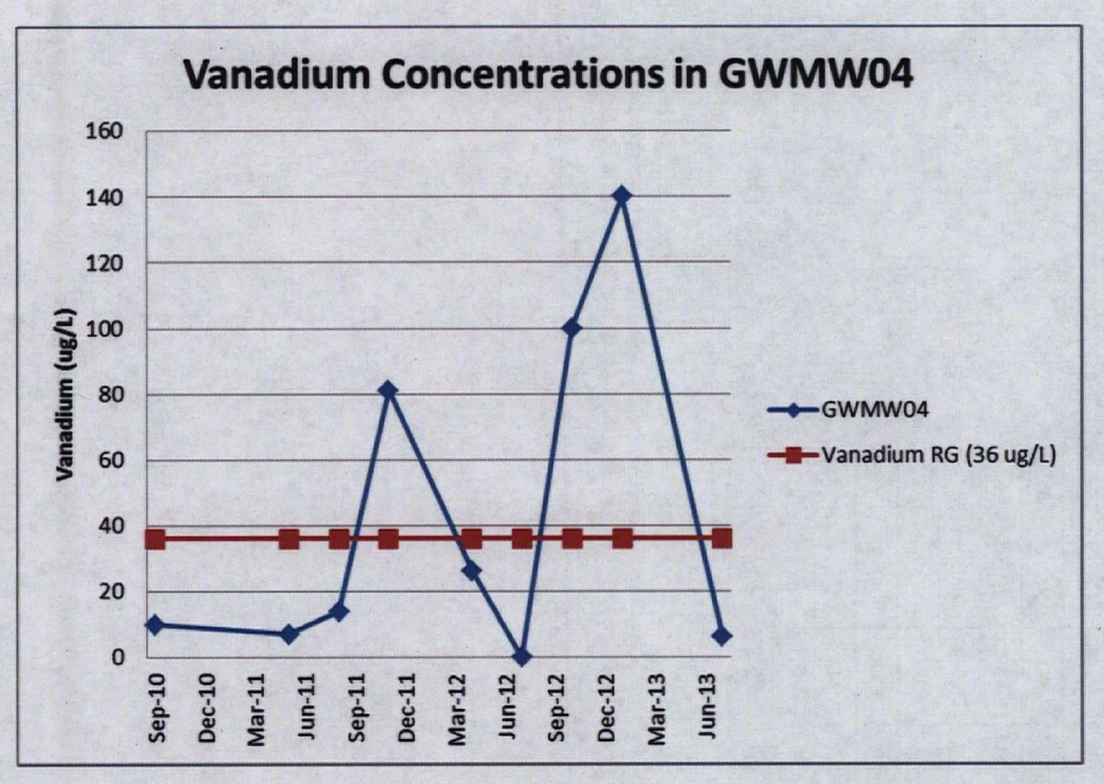
Appendix H: Time Trend COC Graphs for Select Wells






Lead Concentrations in Select Wells
Lead (ug/L)
250
200
150
100
50
0
Sep-10
Dec-10
Mar-11
Jun-11
Sep-11
Dec-11
Mar-12
Jun-12
Sep-12
Dec-12
Mar-13
Jun-13
GWMW06
GWMW07
GWMW18
Lead RG (15 ug/L)


Manganese Concentrations in Select Wells
Manganese (ug/L)
6000
5000
4000
3000
2000
1000
0
Sep-10
Nov-10
Jan-11
Mar-11
May-11
Jul-11
Sep-11
Nov-11
Jan-12
Mar-12
May-12
Jul-12
Sep-12
Nov-12
Jan-13
Mar-13
May-13
Jul-13
GWMW04
GWMW07
USTGW01
GWMW10
GWMW11
GWMW13
GWMW14
GWMW15
GWMW16
Manganese RG (375 ug/L)


Vanadium Concentrations in GWMW04
Vanadium (ug/L)
160
140
120
100
80
60
40
20
0
Sep-10
Dec-10
Mar-11
Jun-11
Sep-11
Dec-11
Mar-12
Jun-12
Sep-12
Dec-12
Mar-13
Jun-13
GWMW04
Vanadium RG (36 ug/L)

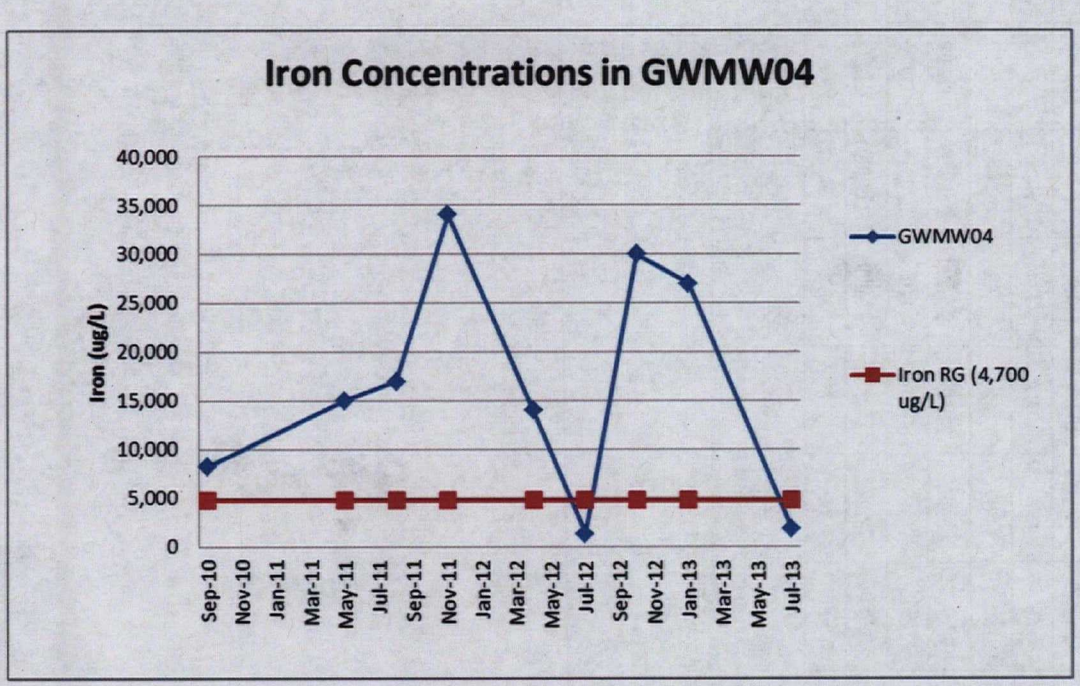

Iron Concentrations in GWMW04
Iron (ug/L)
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Sep-10
Nov-10
Jan-11
Mar-11
May-11
Jul-11
Sep-11
Nov-11
Jan-12
Mar-12
May-12
Jul-12
Sep-12
Nov-12
Jan-13
Mar-13
May-13
Jul-13
GWMW04
Iron RG (4,700 ug/L)

Table H-1: GWVM08 Results, October 2010 to July 2013

COC	RG (µg/L)	MNA criteria (µg/L)	Oct-2010	May-2011	Aug-2011	Nov-2011	Apr-2012	Jul-2012	Oct-2012	Jan-2013	Aug-2013
Aluminum	15,643	156,430	**110,000**	**100,000**	**140,000**	**76,000**	**56,000**	**72,000**	**29,000**	ND	ND
Antimony	6	60	ND	ND	**12**	ND	ND	ND	ND	ND	ND
Cadmium	5	50	**21**	**62**	3	**44**	**38**	**36**	**16**	2.2	3.9
Iron	4,700	47,000	**340,000**	**550,000**	**350,000**	**260,000**	**130,000**	**140,000**	**38,000**	260	ND
Lead	15	150	**86**	**90**	**110**	**200**	**39**	**55**	14	ND	ND
Manganese	375	3,750	**22,000**	**29,000**	**22,000**	**11,000**	**7,200**	**12,000**	**3,300**	160	170
Vanadium	36	360	**94**	18	ND	**90**	**39**	10	ND	ND	ND

Notes:
µg/L = micrograms per liter
Bold result = detected concentration exceeds RG
Underlined result = detected concentrations exceeds MNA screening value
ND = Not detected at or above laboratory detection limit

Table H-2: GWMW07 and GWMW04 Results, October 2010 and July 2013

COC	RG (µg/L)	MNA criteria (µg/L)	Oct-2010	May-2011	Aug-2011	Nov-2011	Apr-2012	Jul-2012	Oct-2012	Jan-2013	Aug-2013
GWMW07											
Aluminum	15,643	156,430	**32,000**	**89,000**	**120,000**	**91,000**	**63,000**	**160,000**	**130,000**	**91,000**	11,000
Antimony	6	60	ND	ND	ND	ND	2	ND	ND	ND	ND
Cadmium	5	50	**42**	**130**	**190**	**300**	**78**	**180**	**140**	**100**	**16**
Iron	4,700	47,000	ND	51	96	ND	200	ND	540	150	ND
Lead	15	150	5	**17**	**18**	**63**	7	14	11	11	8.4
Manganese	375	3,750	**2,200**	**2,900**	**4,100**	**2,800**	**2,200**	**5,100**	**4,100**	**2,900**	**930**
Vanadium	36	360	ND	ND	ND	2	ND	ND	ND	ND	2
GWMW04											
Aluminum	15,643	156,430	**42,000**	**44,000**	**40,000**	**95,000**	ND	**28,000**	**66,000**	**80,000**	**17,000**
Antimony	6	60	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	5	50	**58**	**61**	**60**	**130**	**61**	**32**	**96**	**110**	**22**
Iron	4,700	47,000	**8,200**	**15,000**	**17,000**	**34,000**	**14,000**	1,300	**30,000**	**27,000**	1,800
Lead	15	150	4	9	9	7	5	ND	8	5.3	1.5
Manganese	375	3,750	**400**	**390**	**420**	**840**	340	250	**580**	**700**	210
Vanadium	36	360	10	7	14	**81**	26	ND	**100**	140	6.2

Notes:
µg/L = micrograms per liter
Bold result = detected concentration exceeds RG
Underlined result = detected concentrations exceeds MNA screening value
ND = Not detected at or above laboratory detection limit

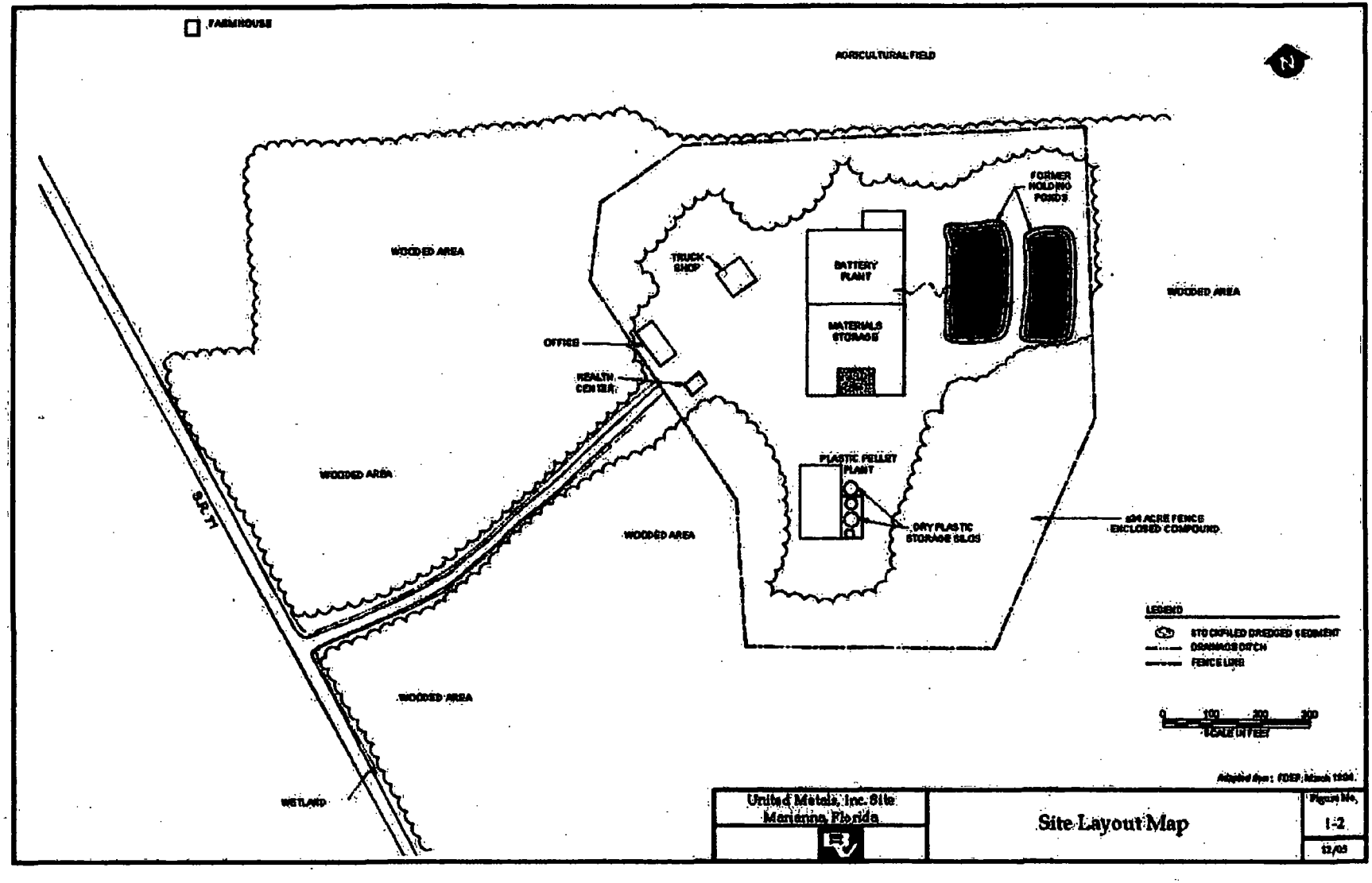
Appendix I: November 2011 Ground Water IC Map

Location	Easting	Northing
1	1757587.8901	614835.6898
2	1757417.1421	614886.9902
3	1757252.6857	614773.3930
4	1757077.4367	614678.6074
5	1756879.7964	614659.2604
6	1756719.9391	614546.7038
7	1756680.1734	614356.7994
8	1756798.4872	614197.1704
9	1756957.5928	614081.9183
10	1756956.1059	613884.0946
11	1756967.9826	613686.4884
12	1757059.2983	613514.7558
13	1757250.9338	613479.9543
14	1757420.9620	613581.9013
15	1757561.0178	613724.1733
16	1757668.8010	613892.2202
17	1757739.6982	614078.8498
18	1757770.6752	614276.0741
19	1757760.4055	614475.4523
GWMW05	1756943.3904	614105.4706
GWMW08	1756969.0050	614666.3725
GWMW12	1757643.9200	614652.7000
GWMW17	1756675.8118	614366.3251
MW02	1757758.7200	614480.0500

Insititutional Control Area - Groundwater (Surficial)/No Use Area - November 2011
United Metals, Inc.
Marianna, Florida

Figure 5-5

Appendix J: Historical Site Features



Appendix K: Cleanup Goal Review

Table K-1: Soil Cleanup Goals and Residential RSLs

COC	Soil Cleanup Goal (mg/kg)[a,b]	Residential Soil Cancer RSL (mg/kg)[c]	Residential Soil Non-Cancer RSL (mg/kg)	Residential	
				Risk	Hazard Index
Antimony	31	NA	31	NA	1.00
Arsenic	2.1	0.61	34	3.44E-06	0.06
Iron	23,400	NA	55,000	NA	0.43
Manganese	3,500	NA	NA	NA	NA
Lead	400	400[d]	400[d]	NA	NA
			Totals	3.44×10^{-6}	1.49

Notes:

a. Obtained from 2006 ROD.

b. Based on residential exposures and a target cancer risk of 1×10^{-6} for carcinogens and a noncancer hazard index of 1.0.

c. RSLs for residential exposure obtained from EPA's November 2013 RSL table http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm

d. EPA's Office of Solid Waste and Emergency Response recommends that a soil lead level less than 400 mg/kg is generally safe for residential use.

The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1×10^{-6} risk:
Cancer risk = (Soil Cleanup Level ÷ Soil Cancer RSL) × 10^{-6}
Non-cancer hazard index was calculated using the following equation:
Hazard index = (Soil Cleanup Level ÷ Soil Non-cancer RSL)

Table K-2: Soil Cleanup Goals and Florida SCTL

COC	Soil Cleanup Goal (mg/kg)[a]	FL Residential Soil SCTL (mg/kg)[b]
	Direct Contact	
Antimony	31	**27**
Arsenic	2.1	2.1
Iron	23,400	53,000
Manganese	3,500	3,500
Lead	400	400
COC	**Soil Cleanup Goal (mg/kg)[a]**	**Leachability-Based Ground Water Criteria (mg/kg)[b]**
	Migration to Ground Water	
Lead	400	400
Antimony	5.4	5.4
Cadmium	7.5	7.5

a. Obtained from 2006 ROD.

b. Florida Soil Cleanup Target Levels (SCTL) obtained from Florida's SCTL table: http://www.dep.state.fl.us/waste/quick_topics/rules/documents/62-777/62-777_TableII_SoilCTLs.pdf.

Bold and highlighted values indicate a cleanup goal exceedance.

Table K-3: Soil Cleanup Goals and Residential Protection of Ground Water SSLs

COC	Soil Cleanup Goal (mg/kg)[a]	Protection of Ground Water Soil Screening Level (mg/kg)[b]	
		Risk-Based SSL (mg/kg)	MCL-Based SSL (mg/kg)
Lead	400[c]	NA	**14**
Antimony	5.4	**0.27**	**0.27**
Cadmium	7.5	**0.52**	**0.38**

Notes:

a. Obtained from 2006 ROD.

b. RSLs for the protection of ground water obtained from EPA's November 2013 Residential Soil to Ground Water RSL table: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.

c. EPA's Office of Solid Waste and Emergency Response recommends that a soil lead level less than 400 mg/kg is generally safe for residential use.

Bold and highlighted values indicate a cleanup goal exceedance.