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Fifteenth Semiannual Monitoring Report
With Addendum #1 to Revised Corrective Action Plan – Part B
Former Pumphouse #1, Release #2
Facility ID #9-025085*2
Former Building 8060
Hunter Army Airfield, Georgia

October 1, 2009

DOCUMENT 23

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Senior Project Manager

Fifteenth Semiannual Monitoring Report with Addendum #1 to Revised Corrective Action Plan – Part B

Hunter Army Airfield

Prepared for:
U.S. Army Environmental Command

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Our Ref.:
GP08HAFS.H13B.EH1R2

Date:
October 1, 2009

Acronyms

ACL	alternate concentration limit
ATL	alternate threshold limit
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
COC	contaminant of concern
COD	Chemical Oxygen Demand
DPT	direct push technology
ft	feet
GA EPD	Georgia Environmental Protection Division
g	gram
HAAF	Hunter Army Air Field
IWQS	In-Stream Water Quality Standards
kg	kilogram
L	liter
µg/L	microgram per liter
mg/L	milligram per liter
mg/kg	milligram per kilogram
MNA	monitored natural attenuation
N_m	mobile porosity
NELAP	National Environmental Laboratory Accreditation Program
NOM	natural organic material
ORC	oxygen-releasing compound
lb	pound
ROI	radius of influence
SAIC	Science Application International Corporation
SOD	soil oxidant demand
UIC	underground injection control
USEPA	U. S. Environmental Protection Agency
USTMP	Underground Storage Tank Management Program
VOC	volatile organic compound

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Fifteenth Semiannual Monitoring Report with Addendum #1 to Revised Corrective Action Plan Part B for Pumphouse #1 Release #2

Hunter Army Airfeld, Georgia

MONITORING REPORT

Submittal Date: October 2009 Monitoring Report Number: 15th Semiannual 2009

For Period Covering: January 2009 to June 2009

Facility Name: Former Pumphouse #1 (Release #2) Street Address: Former Building 8060, Taxiway 3

Facility ID: 9-025085*2 City: Hunter AAF County: Chatham Zip Code: 31409

Latitude: 32° 00′ 54″ Longitude: 81° 08′ 26″

Submitted by UST Owner/Operator:		Prepared by Consultant/Contractor:	
Name:	Tom Fry/ Environmental Branch	Name:	C. Scott Bostian
Company:	U. S. Army/HQ 3d, Inf. Div. (Mech)	Company:	ARCADIS, U.S., Inc.
Address:	DPW ENRD ENV. Building 1137	Address:	801 Corporate Center Drive
	1550 Frank Cochran Drive		Suite 300
City:	Fort Stewart State: GA	City:	Raleigh State: NC
Zip Code:	31314-4927	Zip Code:	27607

1. REGISTERED PROFESSIONAL ENGINEER OR PROFESSIONAL GEOLOGIST CERTIFICATION

I hereby certify that I have directed and supervised the fieldwork and preparation of this plan in accordance with State Rules and Regulations. As a registered professional geologist and/or professional engineer, I certify that I am a qualified groundwater professional as defined by the Georgia State Board of Professional Geologists. All of the information and laboratory data in this plan and in all of the attachments are true, accurate, complete, and in accordance with applicable State Rules and Regulations.

Name: C. Scott Bostian

Signature:

Date: 10/1/09

GEORGIA REGISTERED PE026139 PROFESSIONAL 8/1/84 ENGINEER CURTIS SCOTT BOSTIAN

Georgia Stamp/Seal

2. Project Summary

2.1 Introduction

This Fifteenth Semiannual Monitoring Report with Addendum #1 to the Revised Corrective Action Plan (CAP) – Part B for Pumphouse #1 Release #2 summarizes the June 2009 semiannual sampling event. In addition to the regular sampling event, supplemental data was collected to refine the design of the proposed corrective actions presented in the Revised Corrective Action Plan – Part B with 2008 Annual Report (ARCADIS 2009) submitted to the Georgia Environmental Protection Division (GA EPD) in July 2009.

The former Pumphouse #1, Facility ID #9-025085, was located near former Building 8060 at Hunter Army Airfield (HAAF) in Savannah, Georgia (Figure 2-1). Site investigation and closure activities were conducted at the Former Pumphouse #1 between 1995 and 2000. During the investigation activities, petroleum-related contamination in soil and groundwater was identified (Science Applications International Corporation [SAIC] 2000). The approved corrective actions for soil and groundwater at the former Pumphouse #1 Release #2 in the original CAP – Part B Report included free product removal and monitored natural attenuation (MNA) (SAIC 2000). Two subsequent addenda to the original CAP (SAIC 2002; SAIC 2006) were focused on Release #1 and are not discussed further in this report. In May 2006, six injection wells were installed around the Pumphouse #1 tank pit area for the injection of oxygen-releasing compound (ORC) to enhance the degradation of the benzene, toluene, ethylbenzene and xylene (BTEX) compounds. Injections were conducted from July 2006 through April 2007 and documented in the monitoring reports for the period (SAIC 2007). The reports stated that site contaminant levels were not significantly reduced through the injection of ORC over the 1-year period.

To decrease the remedial timeframe and to mitigate impacts to canal surface water downgradient of the petroleum hydrocarbon plume, ARCADIS proposed two additional remedial actions in the Revised Corrective Action Plan – Part B with 2008 Annual Report (ARCADIS 2009). The objectives of the proposed groundwater corrective actions for the Release #2 impacts are to: (1) reduce the source mass that could extend the remediation timeframe and (2) rapidly mitigate impacts to canal surface water. In-situ chemical oxidation (ISCO) using sodium persulfate was proposed to rapidly reduce contaminant mass in the source areas. The migration of dissolved BTEX to the drainage canal will be mitigated by injecting calcium peroxide into two offset rows of injection points upgradient of the canal. The injected calcium peroxide will serve as a reactive barrier to stimulate biodegradation of contaminants in groundwater prior to discharge into the canal.

Information regarding site background, geology and hydrogeology, and extent of contamination at Pumphouse #1 Release #2, and additional detail on the proposed remedial actions were included in the Revised Corrective Action Plan – Part B with 2008 Annual Report (ARCADIS 2009) and the original CAP-Part B (SAIC 2000).

The conceptual design for the three remediation areas (two source areas and one downgradient barrier) was detailed in the revision to the Revised CAP – Part B (ARCADIS 2009). The Revised CAP-Part B proposed a baseline biogeochemical parameter sampling event and a soil oxidant demand (SOD) test to aid in the dosing design for sodium persulfate and for developing implementation details for calcium peroxide. This was completed in conjunction with the June 2009 semi-annual sampling event. The data set from the sampling in June 2009 was utilized to refine the proposed corrective actions as follows:

- Evaluate plume status and general site geochemistry;
- Determine optimum persulfate dosing;
- Determine the dosing requirement and injection volume of calcium peroxide.

Based on the design details developed from these data and an initial injection of persulfate at the source areas utilizing one injection well at each area, the optimal site specific injection strategy for persulfate will be determined and implemented. Calcium peroxide will be introduced into the subsurface as slurry via direct push technology (DPT). Calcium peroxide will be delivered via 21 direct-push points at the volumes and concentrations determined in this document.

3. Activities and Assessment of Existing Conditions

A groundwater sampling event combining the fifteenth semiannual monitoring and baseline biogeochemical sampling events was conducted in June 2009. The semiannual monitoring was performed in accordance with the CAP-Part B Report (SAIC 2000). Sampling for analysis of biogeochemical parameters was performed to refine the design of corrective actions for groundwater at the Former Tank Pit/Fuel Pit 1C Area (Release #2) proposed in the Revised CAP-Part B Report (ARCADIS 2009). Figures are included in Appendix A and tables are included in Appendix B.

3.1 Potentiometric Data

The First Annual Monitoring Only Report (SAIC 2002) noted that free product was discovered in wells D-MW-5, P1-MW-02, P1-MW-03, and P1-MW-22 in September 2001. Absorbent socks were used for free product recovery from 2001 through May 2005. Free product was removed from various wells using vacuum extraction from June 2005 through July 2006 and April 2007 through January 2008. In July 2008, free product was detected in monitor wells P1-MW-02 and P1-MW-03 at thicknesses of 0.02 and 0.03 feet (ft), respectively. In December 2008, free product was not detected in any measured monitor well. The groundwater elevation was measured in the monitor wells and flow direction in the vicinity of the former tank pits was determined to be toward the south. The groundwater gradient was approximately 0.0055 ft/ft. In June 2009, no free product was detected at the site when groundwater elevations were measured in the monitoring wells prior to sampling. The overall groundwater flow direction in the vicinity of the former tank pits was toward the south. The groundwater levels in monitor wells at the northern part of the site indicated the potential for periodic variation in flow direction. The southerly groundwater gradient was approximately 0.0091 ft/ft. Groundwater potentiometric surface measurements taken in December 2008 and June 2009 are presented on Figures 3-1 and 3-2, respectively. Historical water level measurements are presented in Table 3-1.

3.2 Analytical Data

The June 2009 combined sampling event involved groundwater sample collection from seven monitor wells designated for semiannual sampling (D-MW-05R, D-MW-06R, P1-MW-01, P1-MW-02, P1-MW-19, P1-MW-22, and P1-MW-23) and five wells that are proximate to source areas but have not been recently sampled (P1-MW-03, P1-MW-17, P1-MW-20, P1-MW-21, and P1-CPT-07). Groundwater samples collected from these wells were submitted to a laboratory for analysis of BTEX using United States Environmental Protection Agency (USEPA) Method 8021B/8260B. Samples from six wells (D-MW-05R, P1-CPT-07, P1-MW-02, P1-MW-03, P1-MW-17, P1-MW-20) were also analyzed for biogeochemical parameters, including dissolved iron, total iron, total manganese, sulfate, nitrate, alkalinity, total dissolved solids, total suspended solids, total organic carbon, and chemical oxygen demand. Soil and groundwater samples were taken from two locations with DPT for determination of background oxidant demand. All of the groundwater samples were analyzed by a National Environmental Laboratory Program (NELAP) certified laboratory.

All data reported by the laboratory were evaluated in accordance with the Level II validation protocols. Field parameters from each well that was sampled are provided in Table 3-2. The analytical results are provided in Tables 3-3 and 3-4 and Appendix C. Biogeochemical and volatile organic compound (VOC) data are illustrated in Figures 3-3, 3-4 and 3-5. Analytical results from the June 2009 sampling event are summarized below.

- Benzene was detected in 8 of 12 groundwater samples at concentrations ranging from 26 to 4,100 micrograms per liter (µg/L). The concentrations in three samples exceeded the In-Stream Water Quality Standards (IWQS) of 51 µg/L and in four samples exceeded the alternate concentration limit (ACL) of 285 µg/L.
- Toluene was detected in 10 of 12 groundwater samples at concentrations ranging from 20 to 17,000 µg/L. One sample exceeded the IWQS of 5,980 µg/L.
- Ethylbenzene was detected in 10 of 12 groundwater samples at concentrations ranging from 190 to 2,100. The concentrations did not exceed the IWQS or ACL.
- Total xylenes were detected in 10 of 12 groundwater samples at concentrations ranging from 1,500 to 12,000 µg/L. There is no ACL or IWQS for total xylenes.

The benzene concentrations in the wells sampled during the semi-annual sampling events are plotted on Figure 3-6. The concentrations indicate minimal attenuation with an increase in dissolved benzene concentrations in June 2009. The increase is likely related to the higher groundwater levels.

The baseline biogeochemical parameter data suggest that groundwater in the source areas is anaerobic and highly reducing, as indicated by the lower dissolved oxygen, nitrate, and sulfate levels in the source area wells (D-MW-05R, PI-CPT-07, P1-MW-02, and P1-MW-03) relative to the monitor wells outside the impacted area (P1-MW-07 and P1-MW-20). The depletion of the terminal electron acceptors within the core of the plume provides evidence for the occurrence of BTEX biodegradation.

3.2.1 Data Evaluation for Sodium Persulfate Injection Design

As previously described, the proposed corrective actions will be applied to two source areas and one area for mitigation of surface water impacts. The areas relative to the groundwater plume are illustrated in Figure 3-7. Application of sodium persulfate is proposed for both source areas. The source area associated with the Former Fuel Pit 1C and Defueling Tank (Remediation Area A) and injection design is presented with more detail in Figure 3-8a. The source area associated with Former Building 8060 Tank Pits (Remediation Area B) and injection design is presented in Figure 3-8b.

3.2.1.1 Soil Oxidant Demand

An SOD test was performed using uncontaminated site samples of soil and groundwater at the ARCADIS Treatability Laboratory in Durham, North Carolina. The SOD test was conducted to estimate the amount of sodium persulfate that will be consumed by the oxidizable components of the geological matrix and groundwater. Methodology and results of the SOD test are included as Appendix D. The average SOD from two slurry samples after 7 days of treatment was approximately 20 gram (g) persulfate / kilogram (kg) of soil. This average SOD was used to calculate the persulfate dosage for the initial injection.

Treatability testing was not implemented based on the extensive documentation of BTEX oxidation with persulfate. It is expected that a sufficient treatment of BTEX will be achieved with appropriate dosing of persulfate, which is designed based on the SOD test results and is described in the following section. Also based on industry experience, activation chemicals likely will not be needed for BTEX oxidation.

3.2.1.2 Sodium Persulfate Dosing and Injection Volume Design

Results from the SOD test were translated into a persulfate injection concentration for in-situ application by considering the following:

- Better contact between persulfate and soil organic matter occurs in the laboratory SOD test due to the higher water to soil ratio and sample homogenization. This better contact efficiency results in higher SOD observed in the lab than in the field; and

- Higher SOD values are often observed in laboratory SOD tests due to the second-order kinetics nature of oxidant reactions and the high persulfate dosing applied in SOD tests (to ensure the detection of persulfate at the end of the test).

Based on the above differences between laboratory and field applications of oxidants, directly applying the laboratory SOD result to the entire treatment zone would result in an over-estimation of the demand of the aquifer. Based on ARCADIS's experience in chemical oxidation using persulfate, 75 percent of the laboratory-derived SOD should be applied in-situ. Assuming a total of three persulfate injection events, the persulfate strength in each injection would be 25 percent of the SOD.

Calculations of the persulfate injection concentration from the SOD are included as Appendix E. The estimated persulfate dosing is approximately 57 g sodium persulfate / liter (L) of water. A range of injection volumes were estimated based on the target Radius of Influence (ROI), injection well screen length, and mobile porosity of the injection zone and was described in detail in the Revised CAP – Part B. The estimated injection volumes per well and the corresponding amounts of sodium persulfate with different mobile porosity (n_m) values are shown in the following table:

	$n_m = 0.05$	$n_m = 0.1$	$n_m = 0.15$	$n_m = 0.20$
Injection volume (gallons)	1,763	3,525	5,288	7,050
Weight of sodium persulfate (lb)	843	1,687	2,530	3,374

The exact injection volume required to achieve the target ROI of 10 ft will be verified in the field during the initial injections by monitoring persulfate in the dose-response wells.

3.2.1.3 Well Network

Persulfate injection will be implemented at two source areas: the former Fuel Pit 1C (Area A) and the former Building 8060 (Area B). The treatment for source Areas A and B was targeted to address the areas with highest residual mass based on an evaluation of historical data. As described in the Revised CAP – Part B report, each persulfate target treatment area will include two lines of injection wells installed perpendicular to the groundwater flow direction. The injection lines will be installed approximately 30-foot apart. Each line will be comprised of three injection wells with an on-center spacing of 20 ft between wells. The proposed locations and layouts of the injection wells for Areas A and B are presented on Figures 3-8a and 3-8b, respectively. The injection wells will be constructed as specified in the Revised CAP – Part B report.

The 30-foot spacing between the lines of injection wells was determined based on a target injection ROI of 10 ft and a 30-day travel time of groundwater over a 10-foot distance between the injection radii using a groundwater seepage velocity of 0.33 foot/day. The seepage velocity was calculated based on an average hydraulic gradient of 0.0052 foot/foot and a hydraulic conductivity of 0.0067 ft/min estimated from an aquifer test in1999 (SAIC 2000). With an estimated longevity of 30 to 60 days for persulfate, it is expected that the injected persulfate will remain active when traveling the 10-foot distance between the injection radii. This ensures a complete coverage of persulfate treatment between the injection well lines.

The initial injection in the former Fuel Pit 1C area will be through an injection well installed approximately 10 ft northwest of D-CPT-14, as shown on Figure 3-8a. D-CPT-14 and P1-CPT-19 will be utilized as a dose-response wells to estimate the injection volume required to achieve the target 10-foot ROI. Wells further downgradient of the proposed injection well, including P1-CPT-21, P1-CPT-22, and a new injection well will be used as the initial injection monitoring wells to evaluate treatment effectiveness, movement of persulfate outside of the injection zone, ambient groundwater flow direction and velocity, persulfate reaction kinetics, and potential secondary water quality effects. Additional monitoring wells may be utilized as needed.

The initial injection in the area east of the former Building 8060 will be through a new well installed between P1-J3 and P1-MW-02 as shown on Figure 3-8b. The dose-response wells will be P1-J3 and P1-MW-02, which are both approximately 10 ft from the proposed injection well. Wells that may be utilized as monitoring

wells include P1-J5, P1-CPT-11, and P1-CPT-09. Additional wells may be incorporated into the monitoring well network depending on the initial results of the injection.

3.2.1.4 Initial Injection Implementation and Monitoring

Logistics of the initial persulfate injections and the monitoring plan were described in detail previously in the Revised CAP – Part B (ARCADIS 2009).

3.2.2 Data Evaluation for Calcium Peroxide Injection Design

The area where surface water impacts will be addressed (Remediation Area C) and the injection locations are presented with more detail in Figure 3-8c.

3.2.2.1 Calcium Peroxide Barrier

As described in the Revised CAP – Part B report and presented on Figure 3-8c, two lines of calcium peroxide injection points perpendicular to groundwater flow will be installed approximately 300 ft downgradient of the Building 8060 source area and 100 ft upgradient of the drainage canal. The purpose of calcium peroxide injection is to provide a slow-release source of oxygen for the aerobic biodegradation of BTEX in the groundwater.

Injection points will be installed 10 ft apart and the two rows will be offset by 5 ft. Calcium peroxide will be delivered into the target treatment zone between approximately 8 and 18 ft below ground surface (bgs) using a DPT rig. Existing monitor well P1-MW-19, which is approximately 20 ft downgradient of the calcium peroxide barrier, will be used as a performance monitoring well to monitor dissolved oxygen and BTEX levels in the groundwater on a monthly and quarterly basis, respectively. Effectiveness of the calcium peroxide barrier will also be evaluated by semiannual sampling of the drainage canal for analysis of BTEX. Based on an expected longevity of approximately 6 months for calcium peroxide, a semi-annual injection schedule will be implemented if warranted by BTEX concentrations. This injection schedule is subject to change based on results of the performance monitoring.

3.2.2.2 Calcium Peroxide Dosing and Injection Volume Design

The dosing of calcium peroxide was calculated by considering three sources of oxygen demand in the subsurface:

- Oxygen required by aerobic bacteria to degrade BTEX compounds;
- Oxygen demand by natural organic matter (NOM) in the groundwater; and
- Oxygen demand by NOM in the soil.

The amount of oxygen required to aerobically biodegrade BTEX was calculated using the total BTEX concentration observed in P1-MW-19 during the June 2009 semiannual sampling event and an oxygen utilization factor for BTEX as described in Wiedemeier *et. al*. (1999). The stoichiometry of oxidation reaction of individual BTEX compounds by oxygen was considered when calculating the oxygen utilization factor, which is 3 g oxygen/g BTEX. The oxygen demand by NOM in soil and groundwater was calculated based on an assumed soil NOM content of 200 milligrams per kilogram (mg/kg) soil and an average chemical oxygen demand (COD) in groundwater of 104 milligrams per liter (mg/L) from the June 2009 sampling event. In addition, the mass flux of BTEX and NOM in groundwater through the calcium peroxide barrier within the 6-month longevity of calcium peroxide was determined based on a groundwater seepage velocity of 0.33 foot/day and a barrier cross section of 10 ft (thickness) x 100 ft (length perpendicular to groundwater flow). The total oxygen demand was converted to calcium peroxide dosing using an oxygen content of 17 percent by weight and a safety factor of 1.5 to account for losses of oxygen. The estimated calcium peroxide dosing is approximately 36 g calcium peroxide/L of water. The calcium peroxide dosing calculations are included as Appendix F.

The injection for the calcium peroxide barrier was calculated using the same approach as the persulfate injection volume estimate:

$$V_{inj} = ROI^2 \times \pi \times h \times n_m \times \left(\frac{7.481\, gal}{ft^3} \right)$$

where:

V_{inj} = volume of injection (gal)

ROI = radius of injection (e.g., 5 ft)

h = height of injected fluid column (10 ft)

n_m = mobile porosity

The estimated injection volume per injection point and the corresponding amount of calcium peroxide with different mobile porosity (n_m) values are shown in the following table:

	n_m = 0.05	**n_m = 0.1**	**n_m = 0.15**	**n_m = 0.20**
Injection volume (gallons)	294	587	881	1,175
Mass of calcium peroxide (lb)	71	142	213	284

4. Site Ranking Form

(NOTE: RE-RANK SITE AFTER EACH MONITORING EVENT.)
(Appendix G: Site Ranking Form)

Environmental Site Sensitivity Score:

- 500,750 (Jan. 2007 – 10th Semiannual Monitoring Event)
- 375,500 (Jan. 2008 – Supplemental Investigation and 12th Semiannual Monitoring Event)
- 251,350 (June 2009 – 15th Semiannual Monitoring Event)

5. Underground Injection Permit Application

After approval of the Revised Corrective Action Plan Part B and this Addendum #1, a permit application will be submitted to the Underground Injection Control (UIC) Division of Georgia EPD to allow the initial injection for the performance evaluation phase. The permit will be obtained before the initial injection is initiated. After the data from the initial injection are collected and evaluated, a full UIC Permit Application will be prepared.

6. Conclusions/Recommendations

The monitoring schedule is being conducted in accordance with the CAP–Part B Report (SAIC 2000) as approved by the GA EPD Underground Storage Tank Management Program (USTMP). Termination conditions approved in the CAP–Part B Report were measured benzene concentrations in groundwater below the ACL of 285 µg/L and collection of three confirmatory soil samples to determine if the benzene and chrysene concentrations in those soil samples were below the GA EPD-approved alternate threshold limits (ATL) of 9.3 and 2.1 mg/kg, respectively. Subsurface soil sampling in January 2008 indicated that the benzene concentrations in soil are below the ATL of 9.3 mg/kg. Semiannual monitoring will continue in wells D-MW-05R, D-MW-06R, P1-MW-01, P1-MW-02, P1-MW-19, P1-MW-21, P1-MW-22, and P1-MW-23. The next semiannual sampling event will be conducted in December 2009. The samples will be shipped to an approved laboratory for BTEX analysis using USEPA Method 8021B/8260B. An active remediation strategy to achieve remedial goals within a shorter timeframe and prevent discharges to the canal was proposed in the Revised CAP–Part B submitted to GAEPD USTMP in July 2009. The proposed remedy will be implemented upon approval from GAEPD USTMP. A project schedule was previously provided in the Revised CAP-Part B and GAEPD USTMP will be notified if revisions are required.

7. Reimbursement

Hunter Army Airfield is a federally owned facility and has funded the investigation for the former Pumphouse #1 release #2 site using U. S. Department of Defense Environmental Restoration Account Funds. Application for Georgia USTMP Trust Fund reimbursement is not being pursued at this time.

8. References

ARCADIS. 2009. Final Revised Corrective Action Plan – Part B with 2008 Annual Report for Former Pumphouse #1 (Release #2), Former Building 8060, Facility ID #9-025085*2, Hunter Army Airfield, Georgia. November.

Science Applications International Corporation. 2000. Corrective Action Plan– Part B for Former Pumphouse #1, Facility ID #9-025085, Building 8060, Hunter Army Airfield, Georgia. August.

Science Applications International Corporation. 2002. First Annual Monitoring Only Report for Former Pumphouse #1, Facility ID #9-025085, Building 8060, Hunter Army Airfield, Georgia. August.

Science Applications International Corporation. 2002. Corrective Action Plan– Part B Addendum #1 for Former Pumphouse #1, Facility ID # 9-025085, Building 8060, Hunter Army Airfield, Georgia. September.

Science Applications International Corporation. 2006. Corrective Action Plan- Part B Addendum #2 for Former Pumphouse #1, Building 8060, Facility ID # 9-025085, Hunter Army Airfield, Georgia. July.

Science Applications International Corporation. 2007. Fifth Annual Monitoring Only Report for Former Pumphouse #1, Facility ID #9-025085, Building 8060, Hunter Army Airfield, Georgia. October.

Wiedemeier, T.H., H.S. Rifai, J.T. Wilson, and C Newell. 1999. Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface. John Wiley and Sons.

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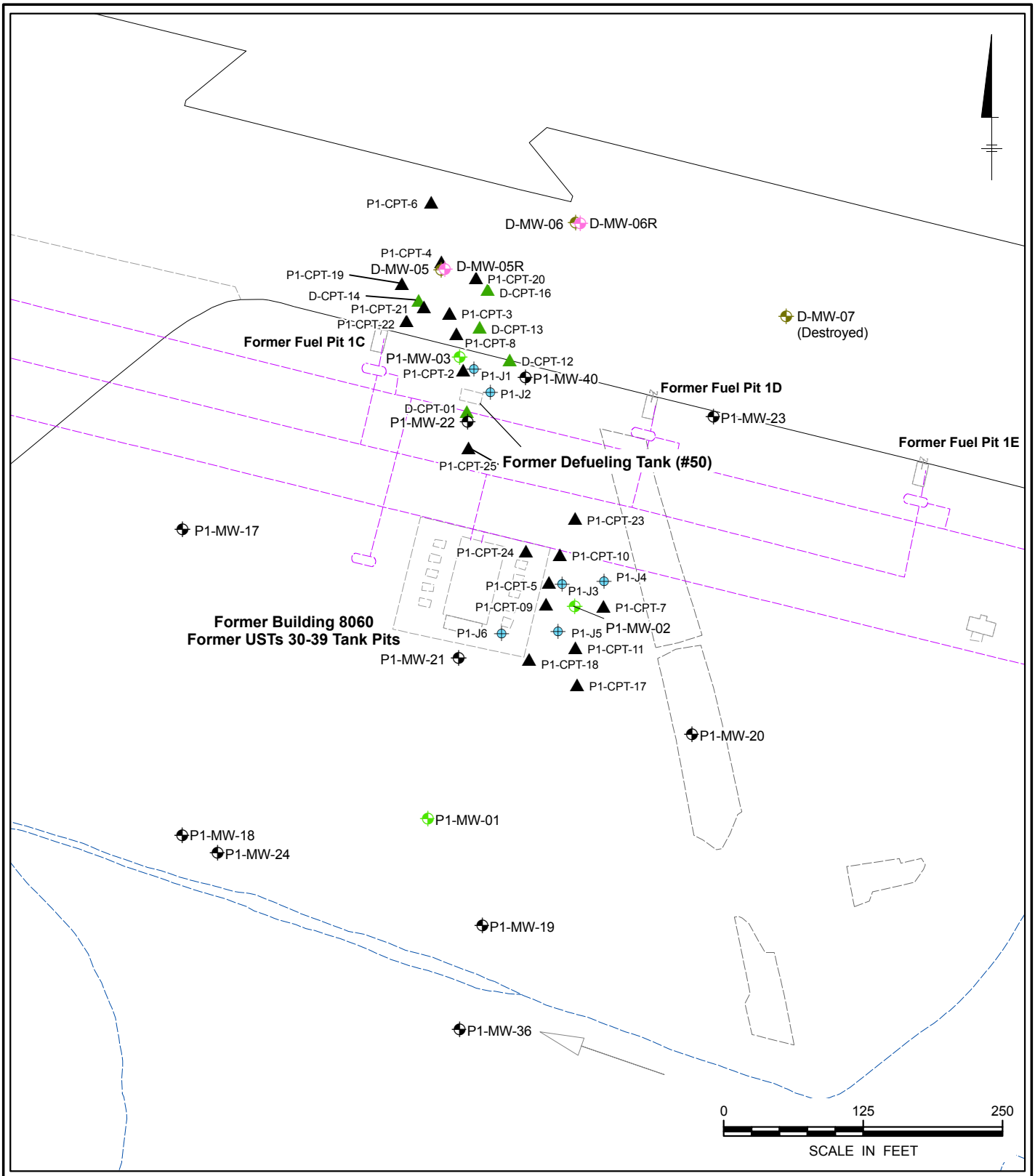
Appendix A

Figures



LEGEND:

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Monitor Well (Destroyed)
- Injection Well
- CPT Well (Pumphouse #1)
- CPT Well (DAACG)
- Former Fuel Transfer Line
- Surface Water Drainage Canal
- Surface Water Flow Direction

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Site Map of Former Pumphouse #1 (Release #2)

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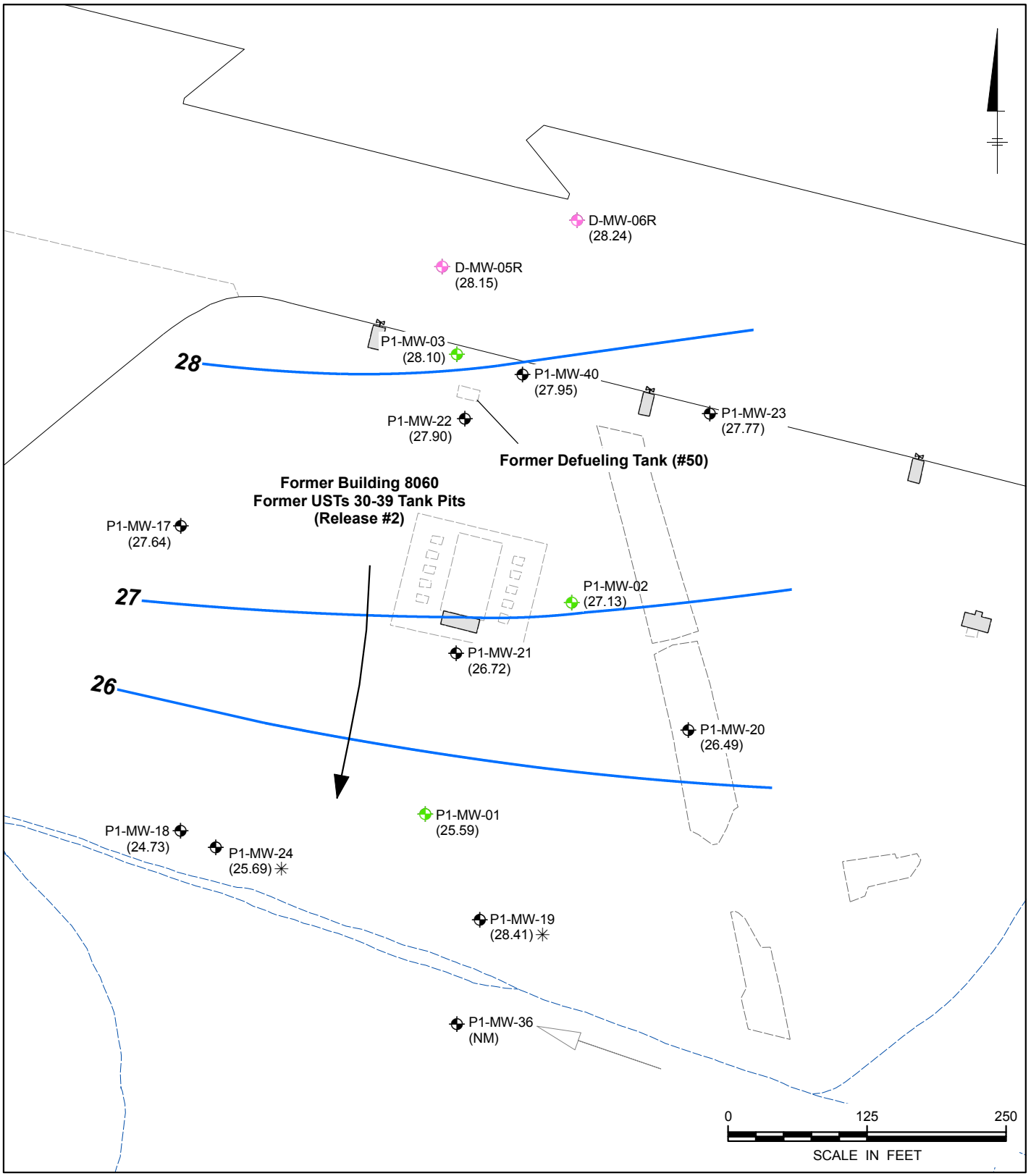
FIGURE 2-1

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 PH1R2 15TH SEMIANNUAL\F2-1 H13_PH1R2_15TH_SITE.MXD SAVED: 21AUG2009



LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Potentiometric Contour (ft, msl)
- Groundwater Flow Direction
- (NM) Not Measured
- (28.41) Water-Level Elevation, (ft, msl) Measured December 15, 2008
- ✳ Not Used to Construct Contours
- Surface Water Drainage Canal
- Surface Water Flow Direction

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Groundwater Potentiometric Surface Map (December 2008)

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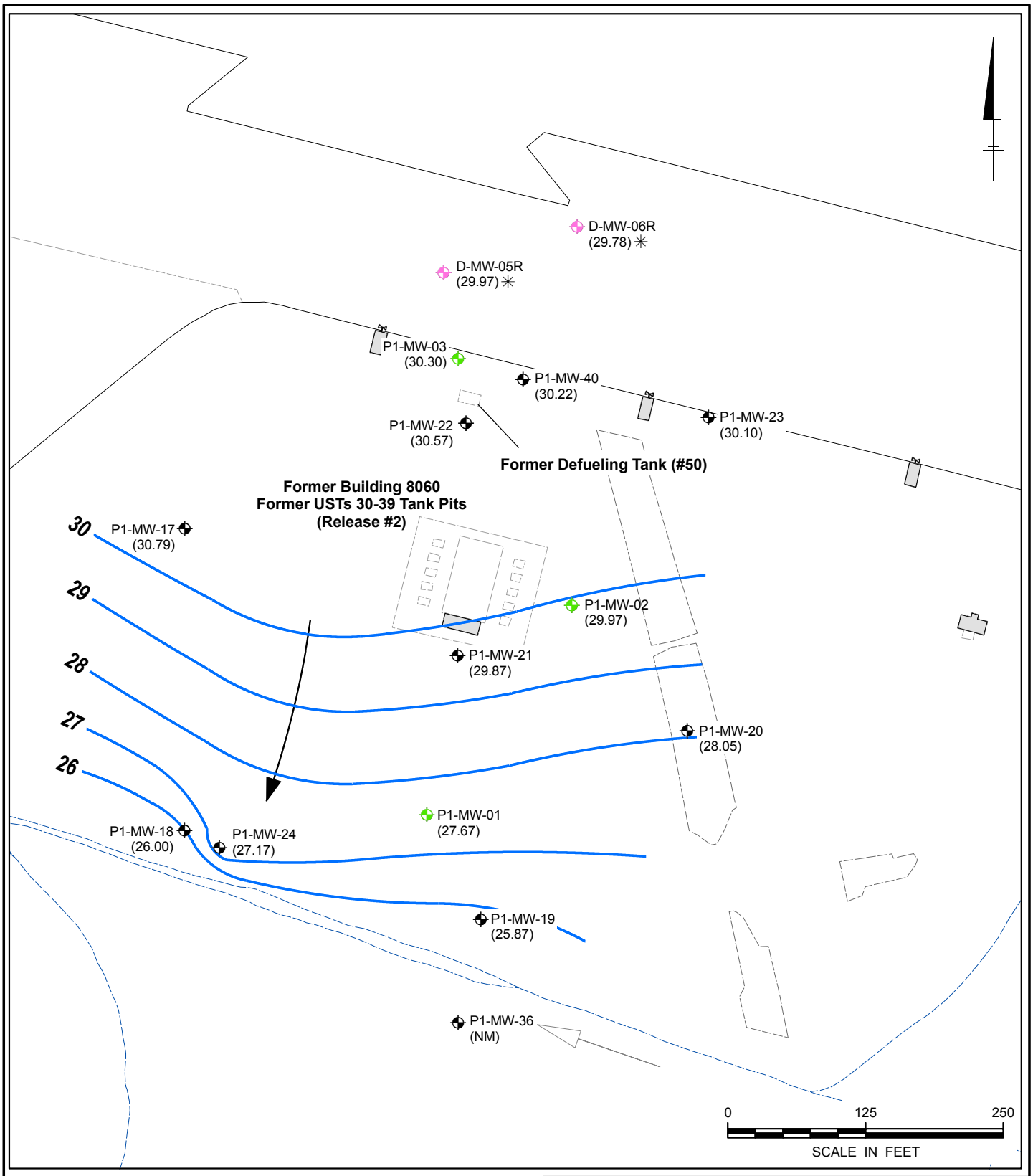
FIGURE 3-1



LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Potentiometric Contour (ft, amsl)
- Groundwater Flow Direction
- Surface Water Drainage Canal
- Surface Water Flow Direction
- (NM) Not Measured
- (25.87) Water-Level Elevation, (ft, amsl) Measured June 2, 2009
- ✳ Not Used to Construct Contours

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Groundwater Potentiometric Surface Map (June 2009)

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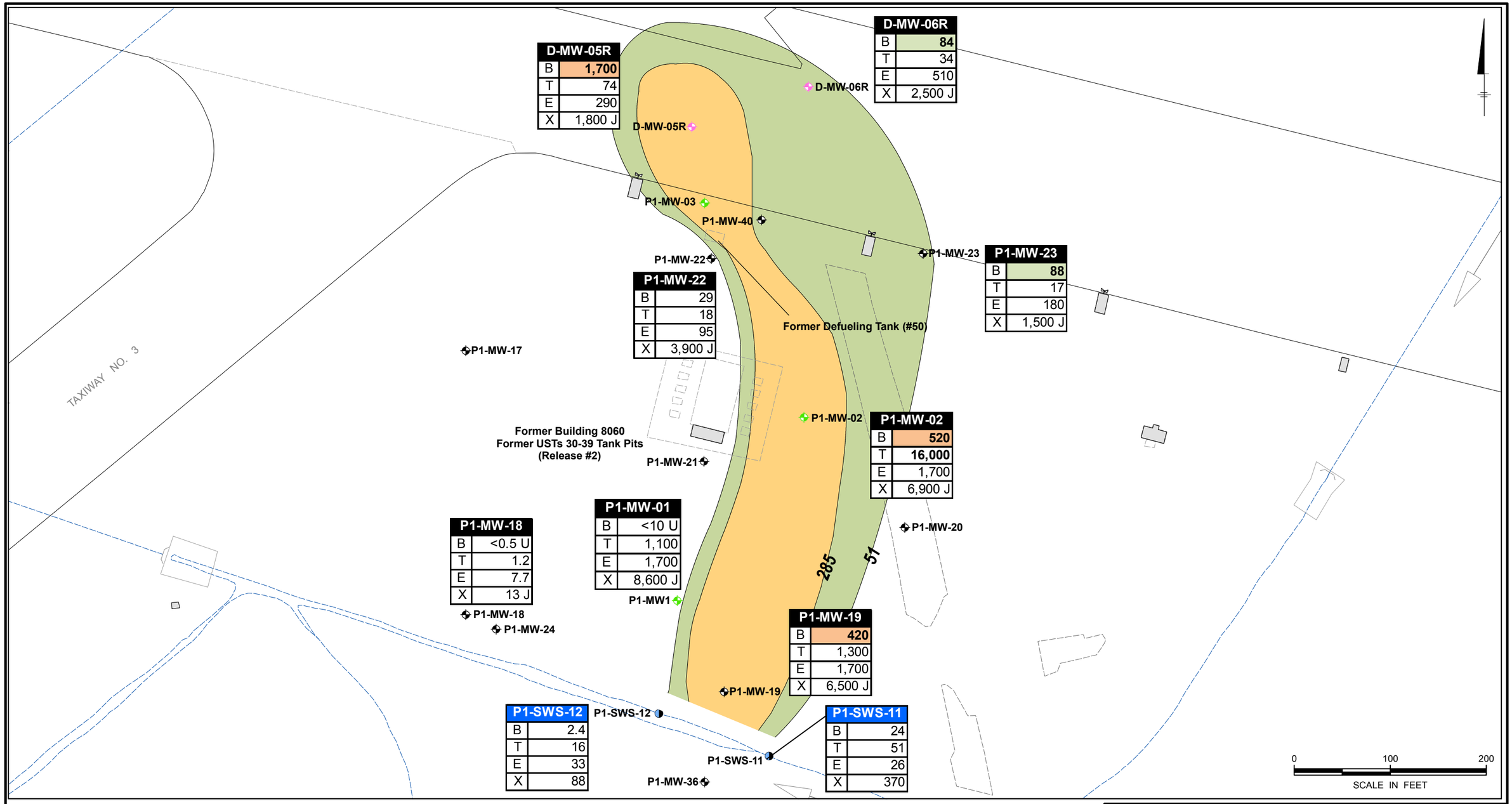
FIGURE
3-2

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 PH1R2 15TH SEMIANNUAL\ F3-2 H13_PH1R2_15TH_200906_POT.mxd SAVED: 21AUG2009



LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Benzene Concentration Exceeds IWQS (51 µg/L)
- Benzene Concentration Exceeds ACL (285 µg/L)
- Surface Water Drainage Canal
- Surface Water Flow Direction

REFERENCE: Sixth Annual Monitoring Only Report (SAIC 2008).

ACRONYMS		IWQS	ACL
B	Benzene	51	285
T	Toluene	5,980	800,000
E	Ethylbenzene	2,100	114,800
X	Xylenes (total)	NRC	---

NOTES:
1) All concentrations reported in micrograms per liter (µg/L).
2) **BOLD** - Concentration exceeds the IWQS.

J - Estimated Value
U - Not Detected

IWQS - In-Stream Water Quality Standard
ACL - Alternate Concentration Limit
NRC - No Regulatory Criteria

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH
ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

BTEX Concentrations in Groundwater Monitor Wells and Surface Water Samples (December 2008)

ARCADIS

FIGURE
3-3

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 P1H1R2 15TH SEMIANNUAL\ F3-3 H13_PH1R2_15TH_BTEX_GW200812.mxd SAVED: 21AUG2009

D-MW-05R	
Sample Date	6/3/2009
B	**4,100**
T	110
E	660
X	5,100

D-MW-06R	
Sample Date	6/4/2009
B	**100**
T	44
E	510
X	3,900

P1-MW-03	
Sample Date	6/4/2009
B	**92**
T	3,100
E	1,700
X	8,100

P1-MW-22	
Sample Date	6/4/2009
B	26
T	72
E	190
X	4,000

P1-MW-23	
Sample Date	6/4/2009
B	**61**
T	20
E	200
X	1,500

P1-MW-17	
Sample Date	6/3/2009
No Detects	

P1-MW-02	
Sample Date	6/3/2009
B	**610**
T	**17,000**
E	2,100
X	8,400

P1-CPT-07	
Sample Date	6/3/2009
B	**1,400**
T	5,600
E	880
X	2,800

P1-MW-21	
Sample Date	6/5/2009
B	ND
T	74
E	1,100
X	4,400

P1-MW-20	
Sample Date	6/3/2009
No Detects	

P1-MW-01	
Sample Date	6/4/2009
B	ND
T	650
E	1,800
X	12,000

P1-MW-19	
Sample Date	6/4/2009
B	**730**
T	390
E	1,700
X	6,600

P1-CPT-06, P1-CPT-04, P1-CPT-19, P1-CPT-20, P1-CPT-21, P1-CPT-03, P1-CPT-22, P1-CPT-08, P1-CPT-02, P1-J1, P1-J2, P1-MW-40, P1-MW-22, P1-CPT-25, P1-CPT-23, P1-CPT-24, P1-CPT-10, P1-CPT-05, P1-J3, P1-J4, P1-CPT-09, P1-CPT-07, P1-J6, P1-J5, P1-CPT-11, P1-CPT-18, P1-CPT-17, P1-MW-21, P1-MW-18, P1-MW-24, P1-SWS-12, P1-SWS-11, P1-MW-36

D-MW-06R, D-MW-05R, P1-MW-03, P1-MW-23, P1-MW17, P1-MW-02, P1-MW-20, P1-MW-01, P1-MW-19

Former Defueling Tank (#50)

Former Building 8060
Former USTs 30-39 Tank Pits
(Release #2)

285

51

TAXIWAY NO. 3

0 100 200
SCALE IN FEET

LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Injection Well
- CPT Well (Pumphouse #1)
- Surface Water Drainage Canal
- Surface Water Flow Direction
- Benzene Concentration Exceeds IWQS (51 µg/L)
- Benzene Concentration Exceeds ACL (285 µg/L)

ND - Not Detected

IWQS- In-Stream Water Quality Standard
ACL - Alternate Concentration Limit

NOTES:
1) Samples collected on June 3-4, 2009.
2) All concentrations reported in micrograms per liter (µg/L).
3) **BOLD** - Concentration exceeds IWQS.

ACRONYMS		IWQS	ACL
B	Benzene	51	285
T	Toluene	5,980	800,000
E	Ethylbenzene	2,100	114,800
X	Xylenes (total)	---	---

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

BTEX Concentrations in Groundwater Monitor Wells (June 2009)

ARCADIS

FIGURE
3-4

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIANVE.MADDOX)
PROJECT: GP08HAFS.F13B.EHR2 PATH: G:\GIS\GP08HAFS\H132009 PH1R2 15TH SEMIANNUAL\ F3-4 H13_PH1R2_15TH_200606_BTEX.mxd SAVED: 21AUG2009

D-MW-05R	
Sample Date	6/3/2009
Iron (dissolved)	0.4
Iron (total)	0.41
Manganese (total)	0.016
Alkalinity	72
COD	170
Nitrate-N	ND
Sulfate	ND
TDS	160
TOC	47
TSS	1.2 J

P1-MW-03	
Sample Date	6/4/2009
Iron (dissolved)	2.0
Iron (total)	2.0
Manganese (total)	0.10
Alkalinity	30
COD	150
Nitrate-N	ND
Sulfate	0.17 J
TDS	70
TOC	37
TSS	6.0

P1-MW-02	
Sample Date	6/3/2009
Iron (dissolved)	1.4
Iron (total)	1.8
Manganese (total)	0.032
Alkalinity	21
COD	160
Nitrate-N	ND
Sulfate	ND
TDS	100
TOC	34
TSS	14

P1-MW-17	
Sample Date	6/3/2009
Iron (dissolved)	0.54
Iron (total)	1.1
Manganese (total)	ND
Alkalinity	13
COD	28
Nitrate-N	0.013 J
Sulfate	5.5
TDS	74
TOC	9.5
TSS	25

P1-CPT-07	
Sample Date	6/3/2009
Iron (dissolved)	1.0
Iron (total)	1.5
Manganese (total)	0.02
Alkalinity	22
COD	100
Nitrate-N	ND
Sulfate	1.6
TDS	89
TOC	25
TSS	42

P1-MW-20	
Sample Date	6/3/2009
Iron (dissolved)	ND
Iron (total)	0.034 J
Manganese (total)	0.025
Alkalinity	ND
COD	18
Nitrate-N	0.52
Sulfate	11
TDS	62
TOC	3.4
TSS	ND

P1-CPT-06
D-MW-06R
P1-CPT-04
D-MW-05R
P1-CPT-19
P1-CPT-20
P1-CPT-21
P1-CPT3
P1-CPT-22
P1-CPT-08
P1-MW-03
P1-CPT-02
P1-J1
P1-MW-40
P1-J2
P1-MW-22
P1-MW-23
P1-CPT-25
Former Defueling Tank (#50)
P1-CPT-23
P1-MW-17
P1-CPT-24
P1-CPT-10
P1-CPT-05
P1-J3
P1-J4
P1-CPT-09
P1-CPT-07
P1-MW-02
Former Building 8060
Former USTs 30-39 Tank Pits
(Release #2)
P1-J6
P1-J5
P1-MW-21
P1-CPT-11
P1-CPT-18
P1-CPT-17
P1-MW-20
TAXIWAY NO. 3
P1-MW-01
P1-MW-18
P1-MW-24
P1-MW-19
P1-SWS-12
P1-SWS-11
P1-MW-36

0 100 200
SCALE IN FEET

LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Injection Well
- CPT Well (Pumphouse #1)
- Surface Water Drainage Canal
- Surface Water Flow Direction

NOTES:
1) Samples collected on June 3-4, 2009.
2) All concentrations reported in milligrams per liter (mg/L).

COD - Chemical Oxygen Demand
TDS - Total Dissolved Solids
TOC - Total Organic Carbon
TSS - Total Suspended Solids

ND - Not Detected
J - Estimated Value

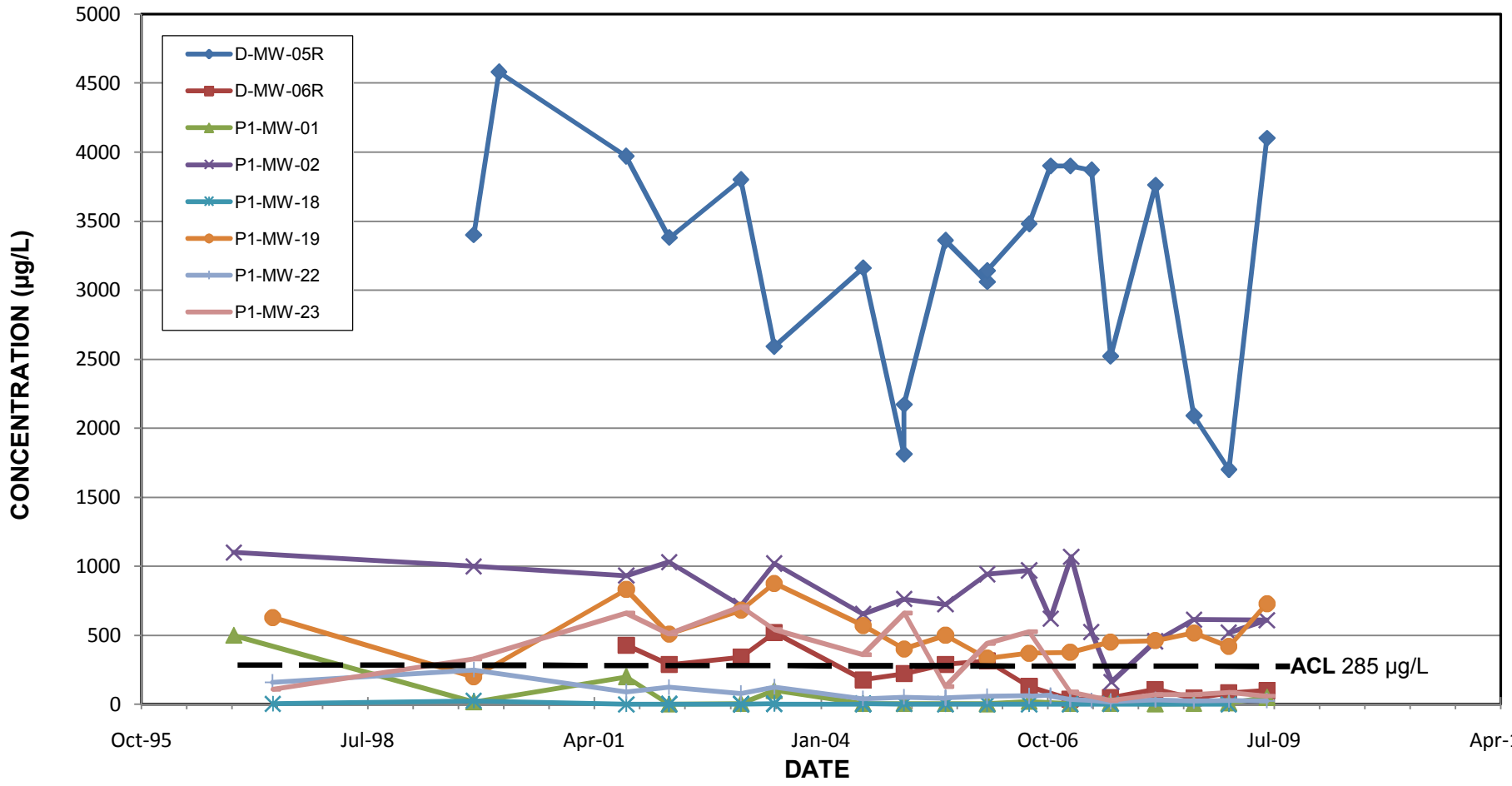
HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH
ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Biogeochemical Concentrations in Groundwater Monitor Wells (June 2009)

ARCADIS

FIGURE
3-5

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 PH1R2 15TH SEMIANNUAL\F3-6 H13_PH1R2_15TH_Benz Trend .ppt SAVED: 13AUG2009



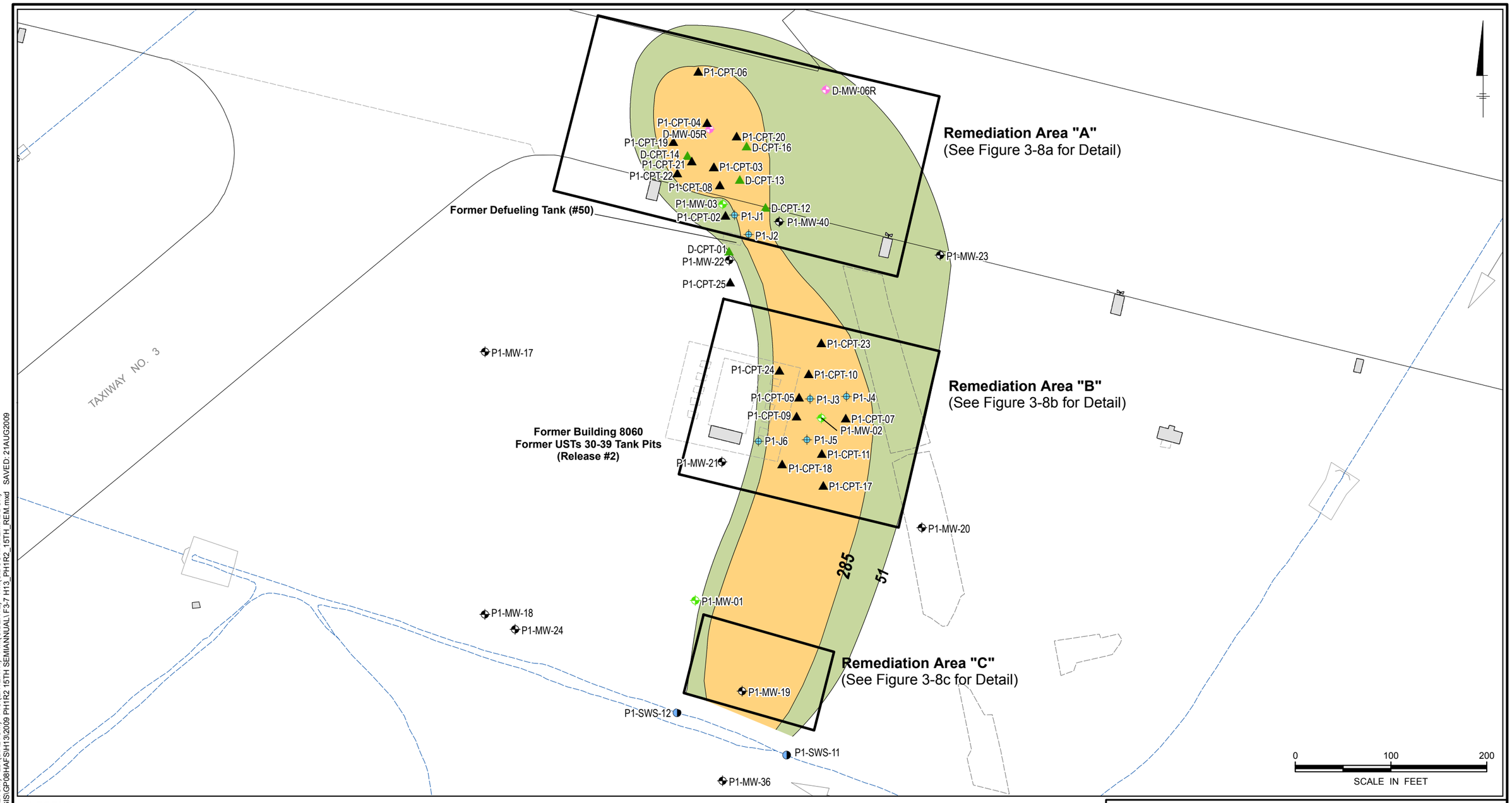
HUNTER ARMY AIRFIELD, GEORGIA

FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Benzene Concentration Versus Time

ARCADIS

FIGURE
3-6



CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 PH1R2 15TH SEMIANNUAL\ F3-7 H13_PH1R2_15TH_REM.mxd SAVED: 21AUG2009

LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Injection Well
- CPT Well (Pumphouse #1)
- CPT Well (DAACG)
- Surface Water Drainage Canal
- Surface Water Flow Direction
- Benzene Concentration Exceeds IWQS (51 µg/L)
- Benzene Concentration Exceeds ACL (285 µg/L)

NOTES:
1) Benzene contours are based on June 2009 data.
2) All concentrations reported in micrograms per liter (µg/L).

IWQS - In-Stream Water Quality Standard
ACL - Alternate Concentration Limit

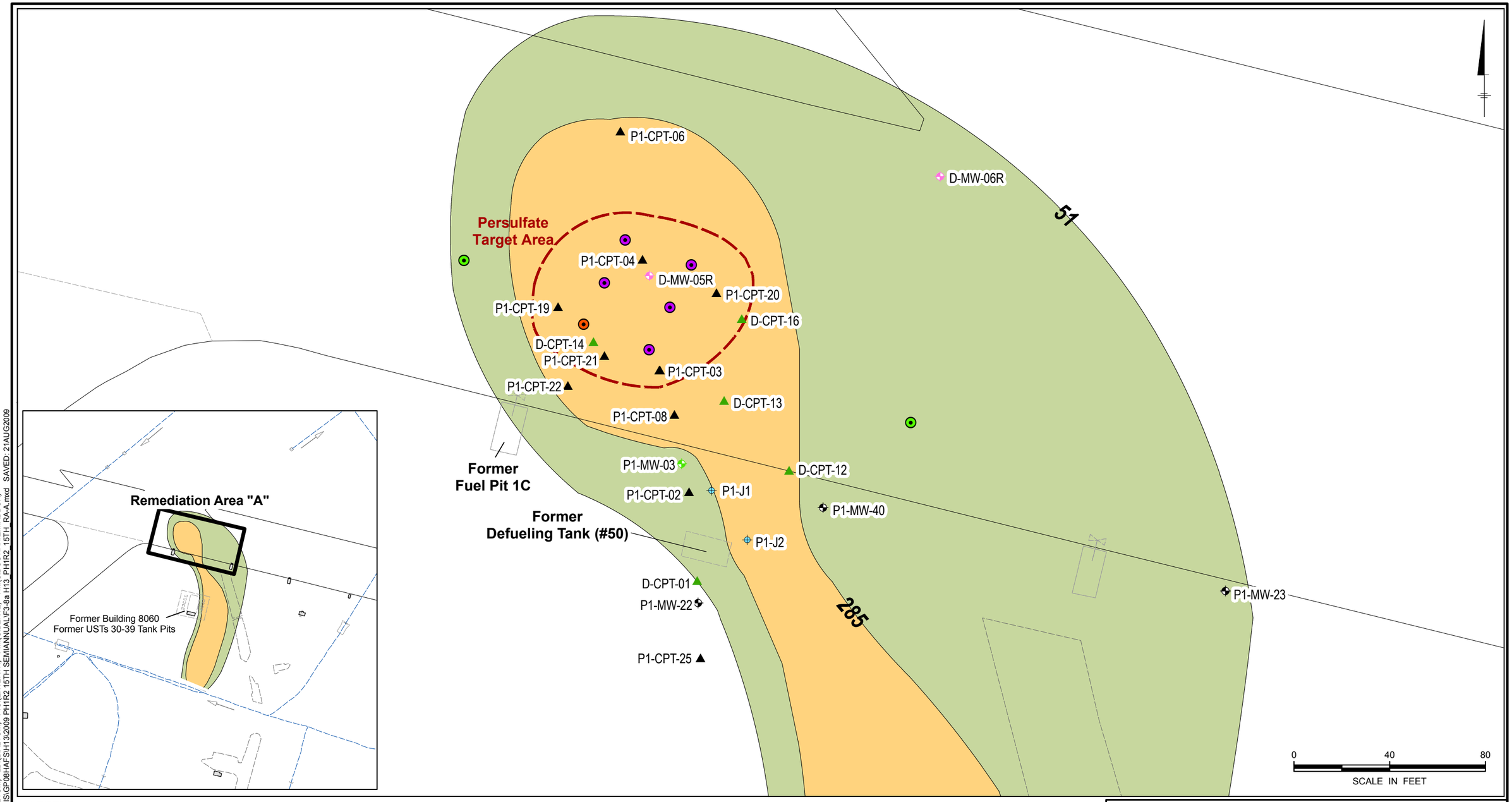
REFERENCE: Sixth Annual Monitoring Only Report (SAIC 2008).

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH
ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Remediation Areas With Existing Wells Shown

ARCADIS

FIGURE
3-7



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PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 PH1R2 15TH SEMIANNUALF3-8a H13_PH1R2_15TH_RA-A.mxd SAVED: 21AUG2009

LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Injection Well
- CPT Well (Pumphouse #1)
- CPT Well (DAACG)
- Surface Water Drainage Canal
- Surface Water Flow Direction
- Benzene Concentration Exceeds IWQS (51 µg/L)
- Benzene Concentration Exceeds ACL (285 µg/L)
- Proposed Monitor Well
- Proposed Initial Injection Well
- Proposed Injection Well

NOTES:
1) Benzene contours are based on June 2009 data.
2) All concentrations reported in micrograms per liter (µg/L).

IWQS - In-Stream Water Quality Standard
ACL - Alternate Concentration Limit

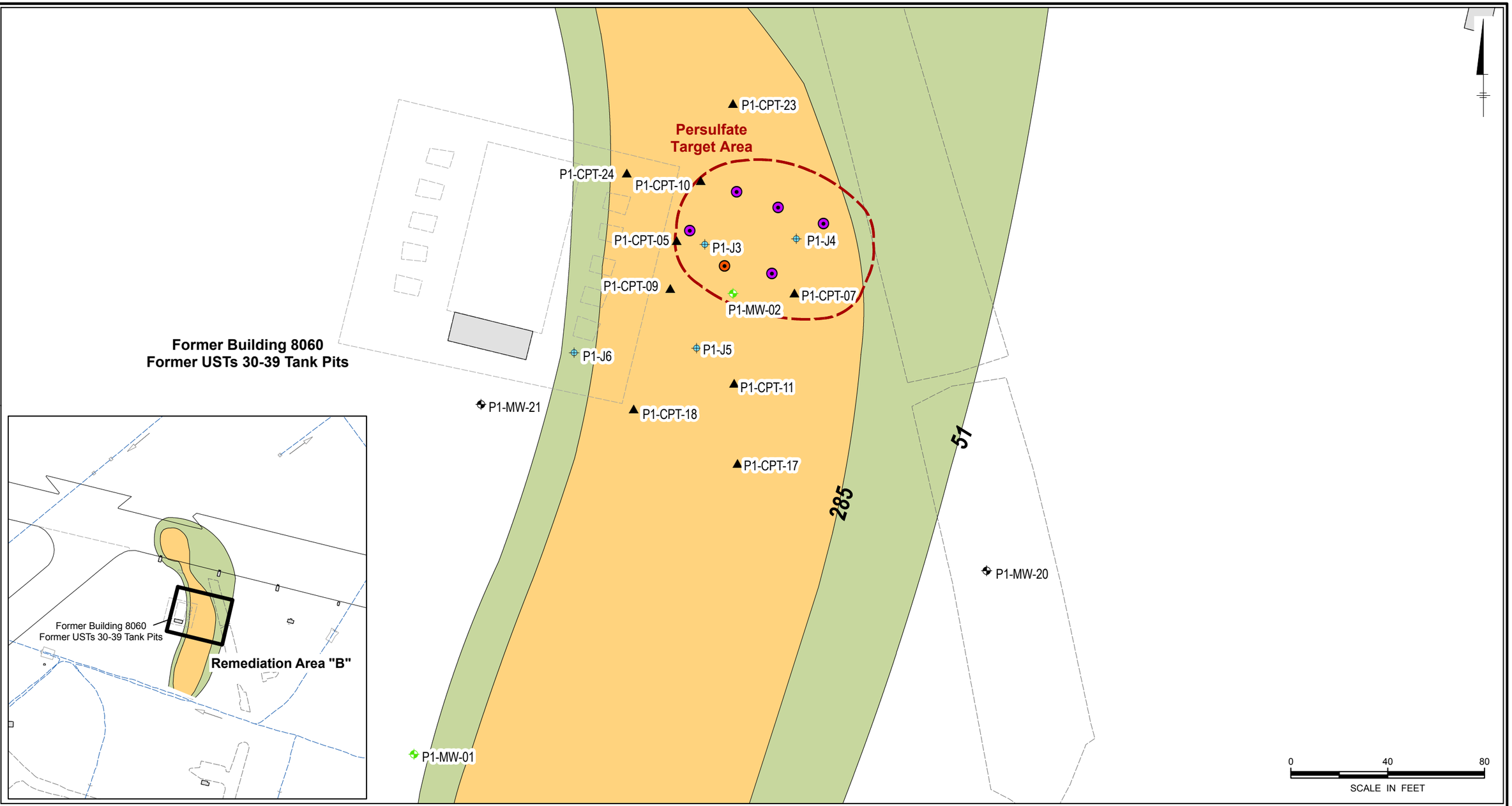
REFERENCE: Sixth Annual Monitoring Only Report (SAIC 2008).

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH
ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Remedial Design for Area "A"
Former Fuel Pit 1C and Defueling Tank

ARCADIS

FIGURE
3-8a



LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Injection Well
- CPT Well (Pumphouse #1)
- CPT Well (DAACG)
- Surface Water Drainage Canal
- Surface Water Flow Direction
- Benzene Concentration Exceeds IWQS (51 µg/L)
- Benzene Concentration Exceeds ACL (285 µg/L)
- Proposed Initial Injection Well
- Proposed Injection Well

NOTES:
1) Benzene contours are based on June 2009 data.
2) All concentrations reported in micrograms per liter (µg/L).

IWQS - In-Stream Water Quality Standard
ACL - Alternate Concentration Limit

REFERENCE: Sixth Annual Monitoring Only Report (SAIC 2008).

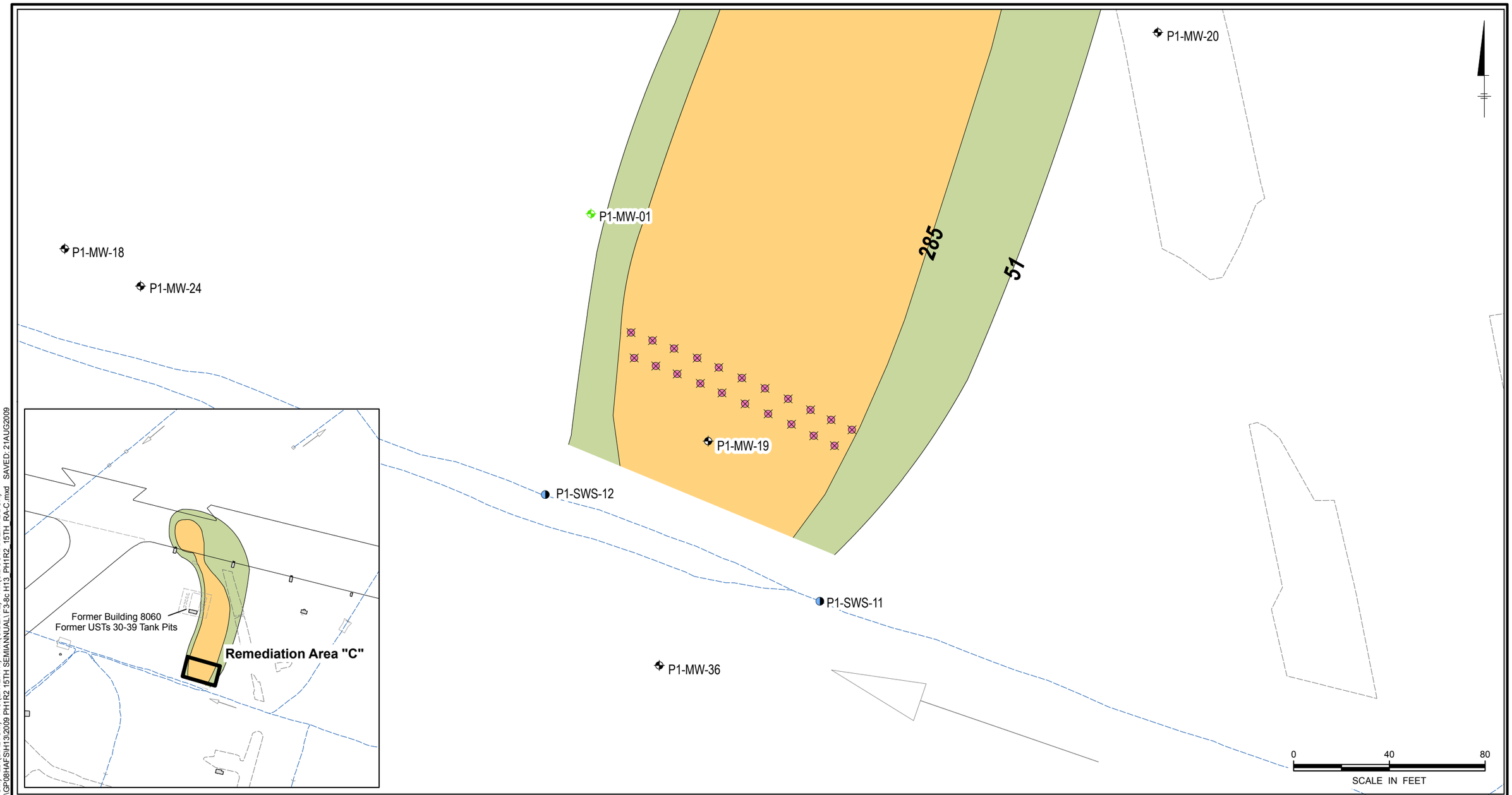
HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH
ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Remedial Design for Area "B"
Former Building 8060 Tank Pits

ARCADIS

FIGURE
3-8b

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAF-S.F13B.EH1R2 PATH: G:\GIS\GP08HAF\SH13\2009 PH1R2 15TH SEMIANNUAL\F3-8b H13_PH1R2_15TH_RA-B.mxd SAVED: 21AUG2009



LEGEND

- Monitor Well (Pumphouse #1 CAP-A)
- Monitor Well (Pumphouse #1 CAP-B)
- Monitor Well (DAACG)
- Surface Water Sample
- Injection Well
- CPT Well (Pumphouse #1)
- CPT Well (DAACG)
- Surface Water Drainage Canal
- Surface Water Flow Direction
- Benzene Concentration Exceeds IWQS (51 µg/L)
- Benzene Concentration Exceeds ACL (285 µg/L)
- Calcium Peroxide DPT Injection Point

NOTES:
1) Benzene contours are based on June 2009 data.
2) All concentrations reported in micrograms per liter (µg/L).

IWQS - In-Stream Water Quality Standard
ACL - Alternate Concentration Limit

REFERENCE: Sixth Annual Monitoring Only Report (SAIC 2008).

HUNTER ARMY AIRFIELD, GEORGIA
FORMER PUMPHOUSE #1 (RELEASE #2)
FORMER BUILDING 8060, FACILITY ID #9-025085*2
FIFTEENTH SEMI-ANNUAL MONITORING REPORT WITH
ADDENDUM TO REVISED CORRECTIVE ACTION PLAN – PART B

Remedial Design for Area "C"
Potential Surface Water Impacts

ARCADIS

FIGURE
3-8c

CITY:(KNOXVILLE) DIV/GROUP:(ENV) DB:(B.ALTOM) LD:(B.ALTOM) PIC:(E.WERTH) PM:(C.BERTZ) TM:(S.BOSTIAN/E.MADDOX)
PROJECT: GP08HAFS.F13B.EH1R2 PATH: G:\GIS\GP08HAFS\H13\2009 PH1R2 15TH SEMIANNUAL\ F3-8c H13_PH1R2_15TH_RA-C.mxd SAVED: 21AUG2009

ARCADIS

Appendix B

Tables

Table 3-1
Historical Groundwater Elevations
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Corrective Action Plan–Part B Investigation – 1999							
D-MW-05	11/1/1999	37.98	6.5 – 16.5	--	9.48	0	28.50
D-MW-06	11/1/1999	37.71	6.0 – 16.0	--	9.36	0	28.35
D-MW-07	11/1/1999	38.16	5.8 – 15.8	--	9.92	0	28.24
P1-MW-01	11/1/1999	36.28	6.8 – 16.8	--	10.81	0	25.47
P1-MW-02	11/1/1999	37.34	7.0 – 17.0	--	10.31	0	27.03
P1-MW-03	11/1/1999	37.24	6.0 – 16.0	--	8.71	0	28.53
P1-MW-18	11/1/1999	35.92	9.5 – 19.5	--	10.47	0	25.45
P1-MW-19	11/1/1999	37.76	9.0 – 19.0	--	12.29	0	25.47
P1-MW-20	11/1/1999	36.98	7.0 – 17.0	--	9.80	0	27.18
P1-MW-22	11/1/1999	37.28	6.0 – 16.0	--	8.83	0	28.45
P1-MW-23	11/1/1999	37.75	7.0 – 17.0	--	9.55	0	28.20
P1-MW-24	11/1/1999	36.12	29.5 – 34.5	--	9.76	0	26.36
P1-MW-40	11/1/1999	37.3	3.8 – 33.8	--	9.01	0	28.29
First Semiannual Sampling Event – September 2001							
D-MW-05	9/5/2001	37.98	6.5 – 16.5	10.83	11.32	0.49	27.09 *a*
D-MW-06	9/5/2001	37.71	6.0 – 16.0	--	10.71	0	27.00
D-MW-07	9/5/2001	38.16	5.8 – 15.8	--	11.21	0	26.95
P1-MW-01	9/5/2001	36.28	6.8 – 16.8	--	10.87	0	25.41
P1-MW-02	9/5/2001	37.34	7.0 – 17.0	10.98	11.05	0.07	26.35 *a*
P1-MW-03	9/5/2001	37.24	6.0 – 16.0	10.29	10.31	0.02	26.95 *a*
P1-MW-18	9/5/2001	35.92	9.5 – 19.5	--	11.16	0	24.76
P1-MW-19	9/5/2001	37.76	9.0 – 19.0	--	12.75	0	25.01
P1-MW-20	9/5/2001	36.98	7.0 – 17.0	--	10.92	0	26.06
P1-MW-22	9/5/2001	37.28	6.0 – 16.0	10.50	10.52	0.02	26.78 *a*
P1-MW-23	9/5/2001	37.75	7.0 – 17.0	--	10.92	0	26.83
P1-MW-24	9/5/2001	36.12	29.5 – 34.5	--	10.56	0	25.56
P1-MW-40	9/5/2001	37.3	3.8 – 33.8	--	10.52	0	26.78
Absorbent Sock Replacement – November 2001							
D-MW-05 *b*	11/8/2001	37.98	6.5 – 16.5	10.96	11.32	0.36	26.98 *a*
D-MW-06 *c*	11/8/2001	37.71	6.0 – 16.0	--	10.77	0	26.94
P1-MW-02 *b*	11/8/2001	37.34	7.0 – 17.0	11.05	11.08	0.03	26.29 *a*
P1-MW-03	11/8/2001	37.24	6.0 – 16.0	NR	NR	NR	NR
P1-MW-22	11/8/2001	37.28	6.0 – 16.0	NR	NR	NR	NR
Absorbent Sock Replacement – January 2002							
D-MW-05 *b*	1/18/2002	37.98	6.5 – 16.5	11.52	11.52	sheen	26.46
D-MW-06 *c*	1/18/2002	37.71	6.0 – 16.0	--	11.18	0	26.53
P1-MW-02 *b*	1/18/2002	36.28	6.8 – 16.8	11.49	11.49	sheen	24.79
P1-MW-03 *b*	1/18/2002	37.24	6.0 – 16.0	10.84	10.84	sheen	26.40
P1-MW-22 *c*	1/18/2002	37.28	6.0 – 16.0	--	11.07	0	26.21

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

NOTES:

AMSL - Above mean sea level

BGS - Below ground surface

BTOC - Below top of casing

NR - Not recorded

a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.

b - The absorbent sock was placed or replaced in the well on the date of the measurements.

c - The absorbent sock was not placed in the well on the date of the measurements.

d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.

e - Science Applications International Corporation was not under contract to change out absorbent socks from August 2003 to May 2004.

Table 3-1
Historical Groundwater Elevations
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Second Semiannual Sampling Event – March 2002							
D-MW-05 *b*	3/14/2002	37.98	6.5 – 16.5	10.95	10.95	sheen	27.03
D-MW-06 *c*	3/14/2002	37.71	6.0 – 16.0	--	10.75	0	26.96
D-MW-07	3/14/2002	38.16	5.8 – 15.8	--	11.14	0	27.02
P1-MW-01	3/14/2002	36.28	6.8 – 16.8	--	10.38	0	25.90
P1-MW-02 *b*	3/14/2002	37.34	7.0 – 17.0	--	10.51	0	26.83
P1-MW-03 *b*	3/14/2002	37.24	6.0 – 16.0	--	10.16	0	27.08
P1-MW-18	3/14/2002	35.92	9.5 – 19.5	--	10.89	0	25.03
P1-MW-19	3/14/2002	37.76	9.0 – 19.0	--	12.50	0	25.26
P1-MW-20	3/14/2002	36.98	7.0 – 17.0	--	10.43	0	26.55
P1-MW-22 *c*	3/14/2002	37.28	6.0 – 16.0	--	10.18	0	27.10
P1-MW-23	3/14/2002	37.75	7.0 – 17.0	--	10.69	0	27.06
P1-MW-24	3/14/2002	36.12	29.5 – 34.5	--	10.38	0	25.74
P1-MW-40	3/14/2002	37.3	3.8 – 33.8	--	10.26	0	27.04
Absorbent Sock Replacement – May 2002							
D-MW-05 *c*	5/17/02	37.98	6.5 – 16.5	--	11.52	0	26.46
D-MW-06 *c*	5/17/02	37.71	6.0 – 16.0	--	11.18	0	26.53
P1-MW-02 *c*	5/17/02	36.28	6.8 – 16.8	--	11.65	0	24.63
P1-MW-03 *c*	5/17/02	37.24	6.0 – 16.0	--	10.89	0	26.35
Absorbent Sock Replacement – June 2002							
D-MW-05	6/7/2002	*d*	*d*	*d*	*d*	*d*	*d*
D-MW-06 *c*	6/7/2002	*d*	*d*	*d*	*d*	*d*	*d*
P1-MW-02 *c*	6/7/2002	37.34	7.0 – 17.0	--	10.96	0	26.38
P1-MW-03 *b*	6/7/2002	37.24	6.0 – 16.0	10.96	11.04	0.08	26.27 *a*
P1-MW-22 c	6/7/2002	37.28	6.0 – 16.0	--	10.54	0	26.74
Absorbent Sock Replacement – July 2002							
D-MW-05	7/11/2002	*d*	*d*	*d*	*d*	*d*	*d*
D-MW-06 *c*	7/11/2002	*d*	*d*	*d*	*d*	*d*	*d*
P1-MW-02 *c*	7/11/2002	37.34	7.0 – 17.0	--	8.93	0	28.41
P1-MW-03 *b*	7/11/2002	37.24	6.0 – 16.0	--	8.29	0	28.95
P1-MW-22 c	7/11/2002	37.28	6.0 – 16.0	--	8.24	0	29.04
Absorbent Sock Replacement – August 2002							
D-MW-05	8/13/2002	*d*	*d*	*d*	*d*	*d*	*d*
D-MW-06	8/13/2002	*d*	*d*	*d*	*d*	*d*	*d*
P1-MW-02 *c*	8/13/2002	37.34	7.0 – 17.0	--	9.72	0	27.62
P1-MW-03 *b*	8/13/2002	37.24	6.0 – 16.0	--	8.78	0	28.46
P1-MW-22 c	8/13/2002	37.28	6.0 – 16.0	--	8.88	0	28.40

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

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BTOC - Below top of casing

NR - Not recorded

a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.

b - The absorbent sock was placed or replaced in the well on the date of the measurements.

c - The absorbent sock was not placed in the well on the date of the measurements.

d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.

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Table 3-1
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Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Absorbent Sock Replacement – September 2002							
D-MW-05	9/24/2002	*d*	*d*	*d*	*d*	*d*	*d*
D-MW-06	9/24/2002	*d*	*d*	*d*	*d*	*d*	*d*
P1-MW-02 *c*	9/24/2002	37.34	7.0 – 17.0	--	10.28	0	27.06
P1-MW-03 *b*	9/24/2002	37.24	6.0 – 16.0	--	9.21	sheen	28.03
P1-MW-22 *b*	9/24/2002	37.28	6.0 – 16.0	9.41	9.42	0.01	27.87 *a*
Absorbent Sock Replacement – October 2002							
D-MW-05	10/20/2002	*d*	*d*	*d*	*d*	*d*	*d*
D-MW-06	10/20/2002	*d*	*d*	*d*	*d*	*d*	*d*
P1-MW-02 *c*	10/20/2002	37.34	7.0 – 17.0	--	8.88	0	28.46
P1-MW-03 *b*	10/20/2002	37.24	6.0 – 16.0	--	8.33	0	28.91
P1-MW-22 *b*	10/20/2002	37.28	6.0 – 16.0	--	8.27	0	29.01
Absorbent Sock Replacement – December 2002							
D-MW-05R	12/20/2002	*d*	*d*	*d*	*d*	*d*	*d*
D-MW-06R	12/20/2002	*d*	*d*	*d*	*d*	*d*	*d*
P1-MW-02 *c*	12/20/2002	37.34	7.0 – 17.0	--	9.43	0	27.91
P1-MW-03 *b*	12/20/2002	37.24	6.0 – 16.0	--	8.63	0	28.61
P1-MW-22 *b*	12/20/2002	37.28	6.0 – 16.0	--	8.77	0	28.51
Third Semiannual Sampling Event – January 2003							
D-MW-05R *c*	1/23/2003	38.18	4.6 – 14.6	--	10.24	0	27.94
D-MW-06R *c*	1/23/2003	37.79	4.8 – 14.8	--	9.31	0	28.48
P1-MW-01	1/23/2003	36.28	6.8 – 16.8	--	10.78	0	25.50
P1-MW-02 *c*	1/23/2003	37.34	7.0 – 17.0	--	10.26	0	27.08
P1-MW-03 *b*	1/23/2003	37.24	6.0 – 16.0	--	9.31	0	27.93
P1-MW-18	1/23/2003	35.92	9.5 – 19.5	--	11.48	0	24.44
P1-MW-19	1/23/2003	37.76	9.0 – 19.0	--	13.30	0	24.46
P1-MW-20	1/23/2003	36.98	7.0 – 17.0	--	10.51	0	26.47
P1-MW-21	1/23/2003	37.29	7.0 – 17.0	--	10.61	0	26.68
P1-MW-22 *b*	1/23/2003	37.28	6.0 – 16.0	--	9.49	0	27.79
P1-MW-23	1/23/2003	37.75	7.0 – 17.0	--	10.07	0	27.68
P1-MW-24	1/23/2003	36.12	29.5 – 34.5	--	10.58	0	25.54
P1-MW-40	1/23/2003	37.3	3.8 – 33.8	--	10.46	0	26.84
Absorbent Sock Replacement – February 2003							
D-MW-05R *c*	2/18/2003	38.18	4.6 – 14.6	--	10.51	0	27.67
D-MW-06R *c*	2/18/2003	37.79	4.8 – 14.8	--	9.98	sheen	27.81
P1-MW-02 *c*	2/18/2003	37.34	7.0 – 17.0	10.74	10.75	0.01	26.60 *a*
P1-MW-03 *b*	2/18/2003	37.24	6.0 – 16.0	9.55	9.56	0.01	27.69 *a*
P1-MW-22 *b*	2/18/2003	37.28	6.0 – 16.0	sheen	9.93	sheen	27.35

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

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b - The absorbent sock was placed or replaced in the well on the date of the measurements.

c - The absorbent sock was not placed in the well on the date of the measurements.

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Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Absorbent Sock Replacement – March 2003							
D-MW-05R *b,c*	3/20/2003	38.18	4.6 – 14.6	--	9.23	0	28.95
D-MW-06R *c*	3/20/2003	37.79	4.8 – 14.8	--	9.02	0	28.77
P1-MW-02 *c*	3/20/2003	37.34	7.0 – 17.0	--	8.81	sheen	28.53
P1-MW-03 *b*	3/20/2003	37.24	6.0 – 16.0	--	7.93	0	29.31
P1-MW-22 *b*	3/20/2003	37.28	6.0 – 16.0	--	8.07	0	29.21
Absorbent Sock Replacement – April 2003							
D-MW-05R *b,c*	4/24/2003	38.18	4.6 – 14.6	--	8.88	0	29.30
D-MW-06R *c*	4/24/2003	37.79	4.8 – 14.8	--	8.61	0	29.18
P1-MW-02 *c*	4/24/2003	37.34	7.0 – 17.0	--	8.66	0	28.68
P1-MW-03 *b*	4/24/2003	37.24	6.0 – 16.0	--	7.80	sheen	29.44
P1-MW-22 *b*	4/24/2003	37.28	6.0 – 16.0	--	7.79	sheen	29.49
Absorbent Sock Replacement – May 2003							
D-MW-05R *c*	5/17/2003	38.18	4.6 – 14.6	--	9.48	0	28.70
D-MW-06R *c*	5/17/2003	37.79	4.8 – 14.8	--	9.04	0	28.75
P1-MW-02 *c*	5/17/2003	37.34	7.0 – 17.0	--	9.79	0	27.55
P1-MW-03 *b*	5/17/2003	37.24	6.0 – 16.0	--	8.56	0	28.68
P1-MW-22 *b*	5/17/2003	37.28	6.0 – 16.0	--	8.80	0	28.48
Fourth Semiannual Sampling Event – June 2003							
D-MW-05R *c*	6/21/2003	38.18	4.6 – 14.6	--	9.63	0	28.55
D-MW-06R *c*	6/21/2003	37.79	4.8 – 14.8	--	9.33	0	28.46
P1-MW-01	6/21/2003	36.28	6.8 – 16.8	--	10.26	0	26.02
P1-MW-02 *c*	6/21/2003	37.34	7.0 – 17.0	--	9.44	0	27.90
P1-MW-03 *b*	6/21/2003	37.24	6.0 – 16.0	--	8.48	0	28.76
P1-MW-18	6/21/2003	35.92	9.5 – 19.5	--	11.13	0	24.79
P1-MW-19	6/21/2003	37.76	9.0 – 19.0	--	13.20	0	24.56
P1-MW-20	6/21/2003	36.98	7.0 – 17.0	--	9.54	0	27.44
P1-MW-21	6/21/2003	37.29	7.0 – 17.0	NR	NR	NR	NR
P1-MW-22 *b*	6/21/2003	37.28	6.0 – 16.0	--	8.72	0	28.56
P1-MW-23	6/21/2003	37.75	7.0 – 17.0	--	9.33	0	28.42
P1-MW-24	6/21/2003	36.12	29.5 – 34.5	--	10.33	0	25.79
P1-MW-40	6/21/2003	37.3	3.8 – 33.8	--	8.68	0	28.62
Absorbent Sock Replacement – June 2003							
D-MW-05R *c*	6/24/2003	38.18	4.6 – 14.6	--	9.53	0	28.65
D-MW-06R *c*	6/24/2003	37.79	4.8 – 14.8	--	9.18	0	28.61
P1-MW-02 *c*	6/24/2003	37.34	7.0 – 17.0	9.29	9.30	0.01	28.05 *a*
P1-MW-03 *b*	6/24/2003	37.24	6.0 – 16.0	--	8.44	0	28.80
P1-MW-22 *b*	6/24/2003	37.28	6.0 – 16.0	--	8.58	0	28.70

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d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.

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Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Absorbent Sock Replacement – July 2003 e							
D-MW-05R *c*	7/20/2003	38.18	4.6 – 14.6	--	10.02	0	28.16
D-MW-06R *c*	7/20/2003	37.79	4.8 – 14.8	--	9.56	0	28.32
P1-MW-02 *c*	7/20/2003	37.34	7.0 – 17.0	--	10.38	0	26.96
P1-MW-03 *b*	7/20/2003	37.24	6.0 – 16.0	--	9.08	0	28.16
P1-MW-22 *b*	7/20/2003	37.28	6.0 – 16.0	--	9.43	0	27.85
Absorbent Sock Replacement – June 2004							
D-MW-05R *b*	6/20/2004	38.18	4.6 – 14.6	11.22	11.31	0.09	26.94 *a*
D-MW-06R *c*	6/20/2004	37.79	4.8 – 14.8	--	10.75	0	27.04
P1-MW-02 *b*	6/20/2004	37.34	7.0 – 17.0	10.98	11.12	0.14	26.34 *a*
P1-MW-03 *b*	6/20/2004	37.24	6.0 – 16.0	--	10.15	0	27.09
P1-MW-22 *b*	6/20/2004	37.28	6.0 – 16.0	--	10.40	0	26.88
Fifth Semiannual Sampling Event – July 2004							
D-MW-05R *b*	7/17/2004	38.18	4.6 – 14.6	--	10.28	0	27.90
D-MW-06R *c*	7/17/2004	37.79	4.8 – 14.8	--	9.88	0	27.91
P1-MW-01	7/17/2004	36.28	6.8 – 16.8	--	10.51	0	25.77
P1-MW-02 *b*	7/17/2004	37.34	7.0 – 17.0	9.81	9.82	0.01	27.53 *a*
P1-MW-03 *b*	7/17/2004	37.24	6.0 – 16.0	--	9.17	0	28.07
P1-MW-18	7/17/2004	35.92	9.5 – 19.5	--	11.32	0	24.60
P1-MW-19	7/17/2004	37.76	9.0 – 19.0	--	13.30	0	24.46
P1-MW-20	7/17/2004	36.98	7.0 – 17.0	--	10.01	0	26.97
P1-MW-21	7/17/2004	37.29	7.0 – 17.0	NR	NR	NR	NR
P1-MW-22 *b*	7/17/2004	37.28	6.0 – 16.0	--	9.16	0	28.12
P1-MW-23	7/17/2004	37.75	7.0 – 17.0	--	9.87	0	27.88
P1-MW-24	7/17/2004	36.12	29.5 – 34.5	--	11.02	0	25.10
P1-MW-40	7/17/2004	37.3	3.8 – 33.8	--	9.33	0	27.97
Absorbent Sock Replacement – August 2004							
D-MW-05R *b*	8/20/2004	38.18	4.6 – 14.6	--	10.05	0	28.13
D-MW-06R *c*	8/20/2004	37.79	4.8 – 14.8	--	9.64	0	28.15
P1-MW-02 *b*	8/20/2004	37.34	7.0 – 17.0	--	9.59	0	27.75
P1-MW-03 *b*	8/20/2004	37.24	6.0 – 16.0	--	8.92	0	28.32
P1-MW-22 *b*	8/20/2004	37.28	6.0 – 16.0	--	8.98	0	28.30
Absorbent Sock Replacement – September 2004							
D-MW-05R *b*	9/18/2004	38.18	4.6 – 14.6	--	8.46	0	29.72
D-MW-06R *c*	9/18/2004	37.79	4.8 – 14.8	--	9.20	0	28.59
P1-MW-02 *b*	9/18/2004	37.34	7.0 – 17.0	--	8.77	0	28.57
P1-MW-03 *b*	9/18/2004	37.24	6.0 – 16.0	7.16	7.17	0.01	30.08 *a*
P1-MW-22 *b*	9/18/2004	37.28	6.0 – 16.0	--	8.08	0	29.20

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c - The absorbent sock was not placed in the well on the date of the measurements.

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Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Absorbent Sock Replacement – October 2004							
D-MW-05R *b*	10/15/2004	38.18	4.6 – 14.6	--	9.52	0	28.66
D-MW-06R *c*	10/15/2004	37.79	4.8 – 14.8	--	9.20	0	28.59
P1-MW-02 *b*	10/15/2004	37.34	7.0 – 17.0	--	9.35	0	27.99
P1-MW-03 *b*	10/15/2004	37.24	6.0 – 16.0	--	8.24	0	29.00
P1-MW-22 *b*	10/15/2004	37.28	6.0 – 16.0	--	8.48	0	28.80
Absorbent Sock Replacement – November 2004							
D-MW-05R *b*	11/20/2004	38.18	4.6 – 14.6	--	10.25	0	27.93
D-MW-06R *c*	11/20/2004	37.79	4.8 – 14.8	--	9.74	0	28.05
P1-MW-02 *b*	11/20/2004	37.34	7.0 – 17.0	--	10.29	0	27.05
P1-MW-03 *b*	11/20/2004	37.24	6.0 – 16.0	--	9.33	0	27.91
P1-MW-21 *c*	11/20/2004	37.29	7.0 – 17.0	10.67	10.68	0.01	26.62 *a*
P1-MW-22 *b*	11/20/2004	37.28	6.0 – 16.0	--	9.51	0	27.77
Absorbent Sock Replacement – December 2004							
D-MW-05R *b*	12/16/04	38.18	4.6 – 14.6	--	10.70	0	27.48
D-MW-06R *c*	12/16/04	37.79	4.8 – 14.8	--	10.13	0	27.66
P1-MW-02 *b*	12/16/04	37.34	7.0 – 17.0	--	10.83	0	26.51
P1-MW-03 *b*	12/16/04	37.24	6.0 – 16.0	--	9.97	0	27.27
P1-MW-21 *c*	12/16/04	37.29	7.0 – 17.0	--	11.24	0	26.05
P1-MW-22 *b*	12/16/04	37.28	6.0 – 16.0	--	10.05	0	27.23
Sixth Semiannual Sampling Event – January 2005							
D-MW-05R *b*	1/14/2005	38.18	4.6 – 14.6	sheen	10.88	sheen	27.30
D-MW-06R *c*	1/14/2005	37.79	4.8 – 14.8	--	10.52	0	27.27
P1-MW-01	1/14/2005	36.28	6.8 – 16.8	--	11.60	0	24.68
P1-MW-02 *b*	1/14/2005	37.34	7.0 – 17.0	sheen	11.15	sheen	26.19
P1-MW-03 *b*	1/14/2005	37.24	6.0 – 16.0	sheen	10.02	sheen	27.22
P1-MW-18	1/14/2005	35.92	9.5 – 19.5	--	12.17	0	23.75
P1-MW-19	1/14/2005	37.76	9.0 – 19.0	--	14.01	0	23.75
P1-MW-21	1/14/2005	37.29	7.0 – 17.0	sheen	11.54	sheen	25.75
P1-MW-22 *b*	1/14/2005	37.28	6.0 – 16.0	sheen	10.32	sheen	26.96
P1-MW-23	1/14/2005	37.75	7.0 – 17.0	--	10.83	0	26.92
Absorbent Sock Replacement – February 2005							
D-MW-05R *b*	2/15/2005	38.18	4.6 – 14.6	--	11.02	0	27.16
D-MW-06R *c*	2/15/2005	37.79	4.8 – 14.8	--	10.41	0	27.38
P1-MW-02 *b*	2/15/2005	37.34	7.0 – 17.0	--	11.40	0	25.94
P1-MW-03 *b*	2/15/2005	37.24	6.0 – 16.0	--	10.21	0	27.03
P1-MW-21 *b*	2/15/2005	37.29	7.0 – 17.0	sheen	11.77	sheen	25.52
P1-MW-22 *b*	2/15/2005	37.28	6.0 – 16.0	sheen	10.55	sheen	26.73

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

NOTES:

AMSL - Above mean sea level

BGS - Below ground surface

BTOC - Below top of casing

NR - Not recorded

a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.

b - The absorbent sock was placed or replaced in the well on the date of the measurements.

c - The absorbent sock was not placed in the well on the date of the measurements.

d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.

e - Science Applications International Corporation was not under contract to change out absorbent socks from August 2003 to May 2004.

Table 3-1
Historical Groundwater Elevations
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Absorbent Sock Replacement – March 2005							
D-MW-05R *b*	3/16/2005	38.18	4.6 – 14.6	7.50	7.50	0	30.68
D-MW-06R *c*	3/16/2005	37.79	4.8 – 14.8	10.04	10.04	0	27.75
P1-MW-02 *b*	3/16/2005	37.34	7.0 – 17.0	10.85	10.85	0	26.49
P1-MW-03 *b*	3/16/2005	37.24	6.0 – 16.0	9.56	9.56	0	27.68
P1-MW-21 *b*	3/16/2005	37.29	7.0 – 17.0	11.20	11.20	0	26.09
P1-MW-22 *b*	3/16/2005	37.28	6.0 – 16.0	9.97	9.97	0	27.31
Seventh Semiannual Sampling Event – July2005							
D-MW-05R *c*	7/16/2005	38.18	4.6 – 14.6	--	8.95	0	29.23
D-MW-06R *c*	7/16/2005	37.79	4.8 – 14.8	--	8.63	0	29.16
P1-MW-01	7/16/2005	36.28	6.8 – 16.8	--	10.21	0	26.07
P1-MW-02 *c*	7/16/2005	37.34	7.0 – 17.0	--	9.17	0	28.17
P1-MW-03 *c*	7/16/2005	37.24	6.0 – 16.0	--	7.92	0	29.32
P1-MW-18	7/16/2005	35.92	9.5 – 19.5	--	11.18	0	24.74
P1-MW-19	7/16/2005	37.76	9.0 – 19.0	--	13.13	0	24.63
P1-MW-21	7/16/2005	37.29	7.0 – 17.0	--	9.65	0	27.64
P1-MW-22 *c*	7/16/2005	37.28	6.0 – 16.0	--	8.15	0	29.13
P1-MW-23	7/16/2005	37.75	7.0 – 17.0	--	8.90	0	28.85
Eighth Semiannual Sampling Event – January 2006							
D-MW-05R	1/15/2006	38.18	4.6 – 14.6	--	9.78	0	28.40
D-MW-06R	1/15/2006	37.79	4.8 – 14.8	--	9.35	0	28.44
P1-MW-01	1/15/2006	36.28	6.8 – 16.8	--	10.74	0	25.54
P1-MW-02	1/15/2006	37.34	7.0 – 17.0	--	10.16	0	27.18
P1-MW-03	1/15/2006	37.24	6.0 – 16.0	--	8.85	0	28.39
P1-MW-18	1/15/2006	35.92	9.5 – 19.5	--	11.60	0	24.32
P1-MW-19	1/15/2006	37.76	9.0 – 19.0	--	13.25	0	24.51
P1-MW-21	1/15/2006	37.29	7.0 – 17.0	--	10.47	0	26.82
P1-MW-22	1/15/2006	37.28	6.0 – 16.0	--	9.05	0	28.23
P1-MW-23	1/15/2006	37.75	7.0 – 17.0	--	9.91	0	27.84
Ninth Semiannual Sampling Event – July 2006							
D-MW-05R *b*	7/18/2006	38.18	4.6 – 14.6	--	10.75	0	27.43
D-MW-06R *c*	7/18/2006	37.79	4.8 – 14.8	--	10.15	0	27.64
P1-MW-01	7/18/2006	36.28	6.8 – 16.8	--	11.38	0	24.90
P1-MW-02 *b*	7/18/2006	37.34	7.0 – 17.0	11.07	11.09	0.02	26.27 *a*
P1-MW-03 *b*	7/18/2006	37.24	6.0 – 16.0	sheen	9.94	sheen	27.30
P1-MW-18	7/18/2006	35.92	9.5 – 19.5	--	11.69	0	24.23
P1-MW-19	7/18/2006	37.76	9.0 – 19.0	--	13.53	0	24.23
P1-MW-21	7/18/2006	37.29	7.0 – 17.0	--	11.47	0	25.82
P1-MW-22 *b*	7/18/2006	37.28	6.0 – 16.0	--	10.30	0	26.98
P1-MW-23	7/18/2006	37.75	7.0 – 17.0	--	10.65	0	27.10

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

NOTES:

AMSL - Above mean sea level
BGS - Below ground surface
BTOC - Below top of casing
NR - Not recorded
a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.
b - The absorbent sock was placed or replaced in the well on the date of the measurements.
c - The absorbent sock was not placed in the well on the date of the measurements.
d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.
e - Science Applications International Corporation was not under contract to change out absorbent socks from August 2003 to May 2004.

Table 3-1
Historical Groundwater Elevations
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Performance Monitoring Event – October 2006							
D-MW-05R *b*	10/23/2006	38.18	4.6 – 14.6	--	11.31	0	26.87
D-MW-06R *c*	10/23/2006	37.79	4.8 – 14.8	10.65	10.68	0.03	27.14 *a*
P1-MW-02 *b*	10/23/2006	37.34	7.0 – 17.0	11.50	11.56	0.06	25.83 *a*
P1-MW-03 *b*	10/23/2006	37.24	6.0 – 16.0	10.51	10.54	0.03	26.73 *a*
P1-MW-18	10/23/2006	35.92	9.5 – 19.5	--	11.88	0	24.04
P1-MW-19	10/23/2006	37.76	9.0 – 19.0	--	13.70	0	24.06
P1-MW-21	10/23/2006	37.29	7.0 – 17.0	--	11.88	0	25.41
P1-MW-22 *b*	10/23/2006	37.28	6.0 – 16.0	10.35	11.86	0.01	26.43 *a*
Tenth Semiannual Sampling Event – January 2007							
D-MW-05R	1/17/2007	38.18	4.6 – 14.6	--	10.99	0	27.19
D-MW-06R	1/17/2007	37.79	4.8 – 14.8	--	10.41	0	27.38
P1-MW-01	1/17/2007	36.28	6.8 – 16.8	--	11.20	0	25.08
P1-MW-02 *b*	1/17/2007	37.34	7.0 – 17.0	10.87	11.05	0.18	26.45 *a*
P1-MW-03	1/17/2007	37.24	6.0 – 16.0	--	10.05	0	27.19
P1-MW-17	1/17/2007	35.78	6.0 – 16.0	--	9.07	0	26.71
P1-MW-18	1/17/2007	35.92	9.5 – 19.5	--	11.66	0	24.26
P1-MW-19	1/17/2007	37.76	9.0 – 19.0	--	13.50	0	24.26
P1-MW-20	1/17/2007	26.98	7.0 – 17.0	--	11.07	0	25.91
P1-MW-21	1/17/2007	37.29	7.0 – 17.0	--	11.28	0	26.01
P1-MW-22	1/17/2007	37.28	6.0 – 16.0	--	10.30	0	26.98
P1-MW-23	1/17/2007	37.75	7.0 – 17.0	--	10.68	0	27.07
P1-MW-24	1/17/2007	36.12	29.5 – 34.5	--	11.06	0	25.06
P1-MW-40	1/17/2007	37.30	3.8 – 33.8	--	10.19	0	27.11
	Performance Monitoring Event – April 2007						
D-MW-05R	4/19/2007	38.18	4.6 – 14.6	--	11.14	0	27.04
D-MW-06R	4/19/2007	37.79	4.8 – 14.8	--	10.46	0	27.33
P1-MW-01	4/19/2007	36.28	6.8 – 16.8	--	11.48	0	24.80
P1-MW-02 *b*	4/19/2007	37.34	7.0 – 17.0	11.04	11.98	0.94	26.19 *a*
P1-MW-03	4/19/2007	37.24	6.0 – 16.0	--	10.31	0	26.93
P1-MW-17	4/19/2007	35.78	6.0 – 16.0	--	9.46	0	26.32
P1-MW-18	4/19/2007	35.92	9.5 – 19.5	--	11.77	0	24.15
P1-MW-19	4/19/2007	37.76	9.0 – 19.0	--	13.61	0	24.15
P1-MW-20	4/19/2007	36.98	7.0 – 17.0	--	11.41	0	25.57
P1-MW-21	4/19/2007	37.29	7.0 – 17.0	--	11.63	0	25.66
P1-MW-22	4/19/2007	37.28	6.0 – 16.0	--	10.60	0	26.68
P1-MW-23	4/19/2007	37.75	7.0 – 17.0	--	10.94	0	26.81
P1-MW-24	4/19/2007	36.12	29.5 – 34.5	--	11.22	0	24.90
P1-MW-40	4/19/2007	37.30	3.8 – 33.8	--	10.45	0	26.85

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

NOTES:

AMSL - Above mean sea level

BGS - Below ground surface

BTOC - Below top of casing

NR - Not recorded

a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.

b - The absorbent sock was placed or replaced in the well on the date of the measurements.

c - The absorbent sock was not placed in the well on the date of the measurements.

d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.

e - Science Applications International Corporation was not under contract to change out absorbent socks from August 2003 to May 2004.

Table 3-1
Historical Groundwater Elevations
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Eleventh Semiannual Monitoring Event and Vacuum Extraction Activities – July 2007							
D-MW-05R	7/13/2007	38.18	4.6 – 14.6	--	10.31	0	27.87
D-MW-06R	7/13/2007	37.79	4.8 – 14.8	sheen	9.83	sheen	27.96
P1-MW-01	7/13/2007	36.28	6.8 – 16.8	--	10.73	0	25.55
P1-MW-02	7/13/2007	37.34	7.0 – 17.0	--	10.27	0	27.07
P1-MW-03	7/13/2007	37.24	6.0 – 16.0	--	9.38	0	27.86
P1-MW-17	7/13/2007	35.78	6.0 – 16.0	--	8.18	0	27.60
P1-MW-18	7/13/2007	35.92	9.5 – 19.5	--	11.23	0	24.69
P1-MW-19	7/13/2007	37.76	9.0 – 19.0	--	13.12	0	24.64
P1-MW-20	7/13/2007	36.98	7.0 – 17.0	--	10.46	0	26.52
P1-MW-21	7/13/2007	37.29	7.0 – 17.0	--	10.64	0	26.65
P1-MW-22	7/13/2007	37.28	6.0 – 16.0	--	9.55	0	27.73
P1-MW-23	7/13/2007	37.75	7.0 – 17.0	--	10.06	0	27.69
P1-MW-24	7/13/2007	36.12	29.5 – 34.5	--	10.61	0	25.51
P1-MW-40	7/13/2007	37.30	3.8 – 33.8	--	9.50	0	27.80
Twelfth Semiannual Monitoring Event and Vacuum Extraction Activities – January 2008							
D-MW-05R	1/27/2008	38.18	4.6 – 14.6	--	9.80	0	28.38
D-MW-06R	1/27/2008	37.79	4.8 – 14.8	--	9.36	0	28.43
P1-MW-01	1/27/2008	36.28	6.8 – 16.8	--	10.21	0	26.07
P1-MW-02	1/27/2008	37.34	7.0 – 17.0	--	9.68	0	27.66
P1-MW-03	1/27/2008	37.24	6.0 – 16.0	--	8.82	0	28.42
P1-MW-17	1/27/2008	35.78	6.0 – 16.0	--	7.25	0	28.53
P1-MW-18	1/27/2008	35.92	9.5 – 19.5	--	10.87	0	25.05
P1-MW-19	1/27/2008	37.76	9.0 – 19.0	--	12.90	0	24.86
P1-MW-20	1/27/2008	36.98	7.0 – 17.0	--	9.93	0	27.05
P1-MW-21	1/27/2008	37.29	7.0 – 17.0	--	10.00	0	27.29
P1-MW-22	1/27/2008	37.28	6.0 – 16.0	--	8.98	0	28.30
P1-MW-23	1/27/2008	37.75	7.0 – 17.0	--	9.57	0	28.18
P1-MW-24	1/27/2008	36.12	29.5 – 34.5	--	10.09	0	26.03
P1-MW-40	1/27/2008	37.30	3.8 – 33.8	--	9.01	0	28.29
Thirteenth Semiannual Monitoring Event – July 2008							
D-MW-05R	7/16/2008	38.18	4.6 – 14.6	--	11.01	0	27.17
D-MW-06R	7/16/2008	37.79	4.8 – 14.8	--	10.36	0	27.43
P1-MW-01	7/16/2008	36.28	6.8 – 16.8	--	11.43	0	24.85
P1-MW-02	7/16/2008	37.34	7.0 – 17.0	11.20	11.22	0.02	26.14
P1-MW-03	7/16/2008	37.24	6.0 – 16.0	10.16	10.17	0.01	27.08
P1-MW-17	7/16/2008	35.78	6.0 – 16.0	--	9.40	0	26.38
P1-MW-18	7/16/2008	35.92	9.5 – 19.5	--	11.63	0	24.29
P1-MW-19	7/16/2008	37.76	9.0 – 19.0	--	13.55	0	24.21

*Source: Thirteenth Semiannual Monitoring Only Report Former Pumphouse #1, Release #2 (SAIC, 2009)

NOTES:

AMSL - Above mean sea level

BGS - Below ground surface

BTOC - Below top of casing

NR - Not recorded

a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.

b - The absorbent sock was placed or replaced in the well on the date of the measurements.

c - The absorbent sock was not placed in the well on the date of the measurements.

d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.

e - Science Applications International Corporation was not under contract to change out absorbent socks from August 2003 to May 2004.

Table 3-1
Historical Groundwater Elevations
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Well Number	Date of Measurement	Top of Casing Elevation (ft AMSL)	Screened Interval (ft BGS)	Depth to Product (ft BTOC)	Depth to Water (ft BTOC)	Product Thickness (ft)	Groundwater Elevation (ft AMSL)
Thirteenth Semiannual Monitoring Event – July 2008 (continued)							
P1-MW-20	7/16/2008	36.98	7.0 – 17.0	--	11.30	0	25.68
P1-MW-21	7/16/2008	37.29	7.0 – 17.0	--	11.57	0	25.72
P1-MW-22	7/16/2008	37.28	6.0 – 16.0	--	10.51	0	26.77
P1-MW-23	7/16/2008	37.75	7.0 – 17.0	--	10.84	0	26.91
P1-MW-24	7/16/2008	36.12	29.5 – 34.5	--	11.08	0	25.04
P1-MW-40	7/16/2008	37.30	3.8 – 33.8	--	10.33	0	26.97
Fourteenth Semiannual Monitoring Event – December 2008							
D-MW-05R	12/15/2008	38.18	4.6 – 14.6	--	10.03	0	28.15
D-MW-06R	12/15/2008	37.79	4.8 – 14.8	--	9.55	0	28.24
P1-MW-01	12/15/2008	36.28	6.8 – 16.8	--	10.69	0	25.59
P1-MW-02	12/15/2008	37.34	7.0 – 17.0	--	10.21	0	27.13
P1-MW-03	12/15/2008	37.24	6.0 – 16.0	--	9.14	0	28.10
P1-MW-17	12/15/2008	35.78	6.0 – 16.0	--	8.14	0	27.64
P1-MW-18	12/15/2008	35.92	9.5 – 19.5	--	11.19	0	24.73
P1-MW-19	12/15/2008	37.76	9.0 – 19.0	--	9.35	0	28.41
P1-MW-20	12/15/2008	36.98	7.0 – 17.0	--	10.49	0	26.49
P1-MW-21	12/15/2008	37.29	7.0 – 17.0	--	10.57	0	26.72
P1-MW-22	12/15/2008	37.28	6.0 – 16.0	--	9.38	0	27.90
P1-MW-23	12/15/2008	37.75	7.0 – 17.0	--	9.98	0	27.77
P1-MW-24	12/15/2008	36.12	29.5 – 34.5	--	10.43	0	25.69
P1-MW-40	12/15/2008	37.30	3.8 – 33.8	--	9.35	0	27.95
Fifteenth Semiannual Monitoring Event – June 2009							
D-MW-05R	6/2/2009	38.18	4.6 – 14.6	--	8.21	0	29.97
D-MW-06R	6/2/2009	37.79	4.8 – 14.8	--	8.01	0	29.78
P1-MW-01	6/2/2009	36.28	6.8 – 16.8	--	8.61	0	27.67
P1-MW-02	6/2/2009	37.34	7.0 – 17.0	--	7.37	0	29.97
P1-MW-03	6/2/2009	37.24	6.0 – 16.0	--	6.94	0	30.30
P1-MW-17	6/2/2009	35.78	6.0 – 16.0	--	4.99	0	30.79
P1-MW-18	6/2/2009	35.92	9.5 – 19.5	--	9.92	0	26.00
P1-MW-19	6/2/2009	37.76	9.0 – 19.0	--	11.89	0	25.87
P1-MW-20	6/2/2009	36.98	7.0 – 17.0	--	8.93	0	28.05
P1-MW-21	6/2/2009	37.29	7.0 – 17.0	--	7.42	0	29.87
P1-MW-22	6/2/2009	37.28	6.0 – 16.0	--	6.71	0	30.57
P1-MW-23	6/2/2009	37.75	7.0 – 17.0	--	7.65	0	30.10
P1-MW-24	6/2/2009	36.12	29.5 – 34.5	--	8.95	0	27.17
P1-MW-40	6/2/2009	37.30	3.8 – 33.8	--	7.08	0	30.22

NOTES:
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BTOC - Below top of casing
NR - Not recorded
a - The groundwater elevation was corrected using a density of 880 kg/m3 for the product.
b - The absorbent sock was placed or replaced in the well on the date of the measurements.
c - The absorbent sock was not placed in the well on the date of the measurements.
d - Wells D-MW-05 and D-MW-06 were destroyed in May 2002 when the tarmac was upgraded. These two wells were reinstalled in October 2002.
e - Science Applications International Corporation was not under contract to change out absorbent socks from August 2003 to May 2004.

Table 3-2
Field Parameters in Monitor Wells - June 2009
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample ID	Turbidity (NTUs)	pH (SU)	Conductivity (uS/cm)	Temp. (^{o}C)	DO (mg/L)
D-MW5R	0.25	5.47	169	24.57	0.65
D-MW6R	2.99	5.25	117	24.34	0.76
P1-CPT7	6.95	5.56	86	22.62	1.93
P1-MW1	0.1	4.33	37	21.75	0.5
P1-MW2	41.8	4.99	54	23.67	0.36
P1-MW3	6.13	4.95	69	22.61	0.69
P1-MW17	101.5	5.38	43	23.29	5.27
P1-MW19	0.33	4.59	42	22.78	0.54
P1-MW20	0.8	3.99	37	24.61	3.51
P1-MW21	6.14	5.46	179	21.96	1.32
P1-MW22	103	5.49	205	21.85	0.35
P1-MW23	0.0	5.11	77	23.03	0.59

Notes:
NTU - Nephelometric Turbidity Units
SU - Standard Unit
mg/L - milligram per Liter
uS/cm - microsiemens per centimeter
^{o}C - degrees Celsius

Table 3-3
Historical Groundwater Analytical Results
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Selected Wells from the Corrective Action Plan–Part A Investigation (Release #2) – 1996							
P1-MW-01	HT4-MW01	12/9/1996	**500 U**	16,000 =	1,900 =	9,500 =	27,400
P1-MW-02	HT4-MW02	12/9/1996	***1,100* =**	25,000 =	1,400 =	5,900 =	33,400
Selected Wells from the Corrective Action Plan–Part B Investigation (Release #2) – 1997							
P1-MW-18	MW1801	5/30/1997	4.2 J	57 =	19 =	110 =	190.2
P1-MW-19	MW1901	5/29/1997	***630* =**	1,900 =	530 =	2,400 =	5,460
P1-MW-22	MW2201	5/29/1997	**160 =**	80 J	200 =	6,200 =	6,660
P1-MW-23	MW2301	5/30/1997	**110 =**	62 =	180 =	1,100 =	1,452
Selected Wells from the Corrective Action Plan–Part B Investigation (Release #2) – 1999							
D-MW-05	H833MW0502	11/3/1999	***3,400* =**	2,000 =	1,200 =	5,250 =	11,850
P1-MW-01	PH1MW0102	11/3/1999	17 J	6,500 =	1,800 =	10,000 =	16,800
P1-MW-02	PH1MW0202	11/3/1999	***1,000* =**	19,000 =	1,600 =	7,700 =	28,300
P1-MW-18	PH1MW1802	11/3/1999	25 U	530 =	370 =	1,650 =	2,300
P1-MW-19	PH1MW1902	11/3/1999	**200 =**	6,400 =	1,800 =	7,800 =	15,100
P1-MW-22	PH1MW2202	11/3/1999	**250 U**	250 U	150 J	8,300 =	8,250
P1-MW-23	PH1MW2302	11/3/1999	***330* =**	110 =	830 =	3,720 =	4,360
Selected Wells from the Corrective Action Plan–Part B Investigation (Release #2) – 2000							
D-MW-05	AK0512	2/23/2000	***4,580* =**	6,860 =	1,560 =	5,800 =	18,800
First Semiannual Monitoring Event (Release #2) – September 2001							
D-MW-05	AK0522	9/6/2001	***3,970* =**	7,490 =	1,390 =	5,040 =	17,890
D-MW-06	AK0622	9/6/2001	***428* =**	844 =	1,010 =	4,080 =	6,362
P1-MW-01	AN0122	9/6/2001	**200 U**	7,930 =	2,120 =	8,290 =	18,340
P1-MW-02	AN0222	9/6/2001	***932* =**	21,200 =	1,470 =	6,050 =	29,652
P1-MW-18	AN1822	9/6/2001	0.22 J	24.3 =	14.5 =	43.6 =	82.62
P1-MW-19	AN1922	9/6/2001	***832* =**	5,830 =	1,200 =	4,510 =	12,372
P1-MW-22	AN2222	9/6/2001	**91.9 =**	67.4 U	178 =	6,350 =	6,687.30
P1-MW-23	AN2322	9/6/2001	***661* =**	70.8 U	975 =	4,630 =	6,336.80
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

Source: Sixth Annual Monitoring Only Report (SAIC, 2008)

Notes:

Bold values exceed IWQS

Italics values exceed alternate threshold limits

ug/L - microgram per Liter

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Historical Groundwater Analytical Results
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Second Semiannual Monitoring Event (Release #2) – March 2002							
D-MW-05	AK0532	3/15/2002	***3,380 =***	1,220 =	1,340 =	4,940 =	10,880
D-MW-06	AK0632	3/15/2002	***288 =***	421 =	705 =	2,850 =	4,264
P1-MW-01	AN0132	3/14/2002	2.5 =	1,910 =	1,900 =	9,440 =	13,252.50
P1-MW-02	AN0232	3/14/2002	***1,030 =***	25,800 J	1,440 =	5,620 =	33,890
P1-MW-18	AN1832	3/14/2002	1 U	38.2 =	30.0 =	118 =	186
P1-MW-19	AN1932	3/14/2002	***510 =***	5,410 =	972 =	3,710 =	10,602
P1-MW-22	AN2232	3/14/2002	**123 =**	100 U	112 =	6,480 =	6,715
P1-MW-23	AN2332	3/14/2002	***510 =***	50 U	818 =	4,180 =	5,508
Third Semiannual Monitoring Event (Release #2) – January 2003							
D-MW-05R	AK0542	1/25/2003	***3,800 =***	6,900 =	1,360 =	4,650 =	16,710
D-MW-06R	AK0642	1/25/2003	***342 =***	1,440 =	1,140 =	4,000 =	6,922
P1-MW-01	AN0142	1/25/2003	4.5 J	7,830 =	2,270 =	10,900 =	21,004.50
P1-MW-02	AN0242	1/25/2003	***714 =***	19,700 =	1,640 =	6,820 =	28,874
P1-MW-18	AN1842	1/25/2003	1 U	36.5 =	61.3 =	169 =	266.8
P1-MW-19	AN1942	1/25/2003	***682 =***	1,510 =	988 =	4,130 =	7,310
P1-MW-22	AN2242	1/25/2003	**78.2 =**	50 U	156 =	6,050 =	6,284.20
P1-MW-23	AN2342	1/25/2003	***709 =***	127 =	1,080 =	4,210 =	6,126
Fourth Semiannual Monitoring Event (Release #2) – June 2003							
D-MW-05R	AK0552	6/21/2003	***2,590 =***	1,530 =	881 =	3,300 =	8,301
D-MW-06R	AK0652	6/21/2003	***520 =***	137 =	1,260 =	3,830 =	5,747
P1-MW-01	AN0152	6/21/2003	**100 U**	6,560 =	2,080 =	10,800 =	19,440
P1-MW-02	AN0252	6/21/2003	***1,020 =***	26,200 =	1,990 =	7,760 =	36,970
P1-MW-18	AN1852	6/21/2003	2 U	85.9 =	157 =	446 =	688.9
P1-MW-19	AN1952	6/21/2003	***876 =***	2,230 =	1,470 =	5,180 =	9,756
P1-MW-22	AN2252	6/21/2003	**126 =**	9 J	90.2 =	6,340 =	6,565.20
P1-MW-23	AN2352	6/21/2003	***542 =***	140 =	1,290 =	5,050 =	7,022
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

Source: Sixth Annual Monitoring Only Report (SAIC, 2008)

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Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Fifth Semiannual Monitoring Event (Release #2) – July 2004							
D-MW-05R	AK0562	7/16/2004	***3,160 =***	1,020 =	925 =	4,630 =	9,735
D-MW-06R	AK0662	7/16/2004	**177 =**	45 =	396 =	3,450 =	4,068
P1-MW-01	AN0162	7/16/2004	5.6 =	4,180 =	1,800 =	8,910 =	14,895
P1-MW-02	AN0262	7/16/2004	***654 =***	22,000 =	2,030 =	8,040 =	32,724
P1-MW-18	AN1862	7/16/2004	1 U	74.1 =	110 =	370 =	554.1
P1-MW-19	AN1962	7/16/2004	***571 =***	6,170 =	1,630 =	6,390 =	14,761
P1-MW-22	AN2262	7/16/2004	40.7 =	39.1 U	85.7 =	5,400 =	5,565.50
P1-MW-23	AN2362	7/16/2004	***360 =***	24.0 =	544 =	3,400 =	4,328
Sixth Semiannual Monitoring Event (Release #2) – January 2005							
D-MW-05R	AK0572	1/14/2005	***1,810 J***	164 J	688 J	3,240 J	5,902
D-MW-06R	AK0672	1/14/2005	**222 J**	183 J	657 J	3,360 J	4,422
P1-MW-01	AN0172	1/14/2005	6.4 =	4,220 J	1,420 J	6,690 J	12,336.40
P1-MW-02	AN0272	1/14/2005	***762 J***	19,200 J	1,420 J	5,630 J	27,012
P1-MW-18	AN187	1/14/2005	2.8 J	141 J	42.5 J	147 J	333.3
P1-MW-19	AN1972	1/14/2005	***402 J***	1,320 J	1,040 J	3,800 J	6,562
P1-MW-22	AN2272	1/14/2005	52.8 =	12.5 U	82.5 J	8,430 J	8,565.30
P1-MW-23	AN2372	1/15/2004	***660 =***	38.9 =	694 =	3,240 =	4,632.90
Seventh Semiannual Monitoring Event (Release #2) – July 2005							
D-MW-05R	AK0582	7/16/2005	***3,360 =***	734 =	893 =	4,030 =	9,017
D-MW-06R	AK0682	7/16/2005	***289 =***	159 U	545 =	3,430 =	4,264
P1-MW-01	AN0182	7/16/2005	4.2 =	3,140 =	1,990 =	11,100 =	16,234.20
P1-MW-02	AN0282	7/16/2005	***724 =***	19,300 =	1,590 =	6,770 =	28,384
P1-MW-18	AN1882	7/16/2005	1 U	18.3 =	38.8 =	118 =	175.1
P1-MW-19	AN1982	7/16/2005	***500 =***	1,790 =	1,540 =	5,830 =	9,660
P1-MW-22	AN2282	7/16/2005	43.7 =	28.0 U	61.3 =	2,700 =	2,805
P1-MW-23	AN2382	7/16/2005	**129 =**	31.0 U	474 =	1,750 =	2,353
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

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Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Eighth Semiannual Monitoring Event (Release #2) – January 2006							
D-MW-05R	AK0592	1/16/2006	***3,060*** **=**	369 =	918 =	4,380 =	8,727
D-MW-06R	AK0692	1/16/2006	***315*** **=**	67.5 =	880 =	5,220 =	6,482.50
P1-MW-01	AN0192	1/16/2006	4 =	3,250 =	2,030 =	11,100 =	16,384
P1-MW-02	AN0292	1/16/2006	***943*** **=**	20,300 =	2,400 =	10,800 =	34,443
P1-MW-18	AN1892	1/16/2006	1 U	9.6 =	22.8 =	75.8 =	108.2
P1-MW-19	AN1992	1/16/2006	***333*** **=**	2,590 =	1,890 =	7,850 =	12,663
P1-MW-22	AN2292	1/16/2006	57.5 =	10.7 =	65.1 =	5,250 =	5,383.30
P1-MW-23	AN2392	1/16/2006	***442*** **=**	35.9 =	875 =	4,580 =	6,032.90
Ninth Semiannual Monitoring Event (Release #2) – July 2006							
D-MW-05R	AK0502	7/20/2006	***3,480*** **=**	155 =	995 =	4,260 =	8,890
D-MW-06R	AK0602	7/20/2006	**129 =**	56.8 U	735 =	4,130 =	5,050
P1-MW-01	AN0102	7/20/2006	20 U	2,690 =	1,880 =	8,580 =	13,150
P1-MW-02	AN0202	7/20/2006	***970*** **=**	24,500 =	1,880 =	7,770 =	35,120
P1-MW-18	AN1802	7/20/2006	1 U	10.3 =	13.9 =	54.7 =	78.9
P1-MW-19	AN1902	7/20/2006	***371*** **=**	3,220 =	1,810 =	7,130 =	12,531
P1-MW-21	AN2102	7/20/2006	64.4 =	182 =	377 =	991 =	1,614.40
P1-MW-22	AN2202	7/20/2006	58.7 =	20 U	74.2 =	5,530 =	5,662.90
P1-MW-23	AN2302	7/20/2006	***527*** **=**	27.9 U	754 =	4,410 =	5691
P1-J1	AN0118	7/20/2006	69.5 =	292 =	1,040 =	5,060 =	6,461.50
P1-J2	AN0218	7/20/2006	**268 =**	3,230 =	1,430 =	5,860 =	10,788
P1-J3	AN0318	7/20/2006	***900*** **=**	17,600 =	1,570 =	6,670 =	26,740
P1-J4	AN0418	7/20/2006	***729*** **=**	10,700 =	1,390 =	5,190 =	18,009
P1-J5	AN0518	7/20/2006	***601*** **=**	15,000 =	1,620 =	6,870 =	24,091
P1-J6	AN0618	7/20/2006	**114 =**	1,900 =	967 =	3,040 =	6,021
Performance Monitoring Event – October 2006							
D-MW-05R	AK05A2	10/23/2006	***3,900*** **=**	357 =	1,370 =	5,610 =	11,137
P1-MW-02	AN02A2	10/23/2006	***622*** **=**	22,800 =	2,060 =	8,230 =	33,712
P1-MW-21	AN21A2	10/23/2006	56.8 =	2,240 =	486 =	1,320 =	4,102.80
P1-MW-22	AN22A2	10/23/2006	58.1 =	15.2 J	77.6 =	7,000 =	7,150.90
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

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Former Building 8060
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Tenth Semiannual Monitoring Event (Release #2) – January 2007							
D-MW-05R	AK05B2	1/17/2007	***3,900 =***	1,080 =	1,260 =	5,540 =	11,780
D-MW-06R	AK06B2	1/17/2007	37.5 **=**	47.8 =	573 =	3,790 =	4,448.30
P1-MW-01	AN01B2	1/17/2007	6.56 =	2,090 =	1,570 =	7,530 =	11,196.56
P1-MW-02	AN02B2	1/22/2007	***1,070 =***	19,600 J	1,600 =	6,240 =	28,510
P1-MW-18	AN18B2	1/17/2007	1 U	10.8 =	44 =	150 =	204.8
P1-MW-19	AN19B2	1/17/2007	***376 =***	2,710 =	1,860 =	7,000 =	11,946
P1-MW-21	AN21B2	1/22/2007	3.23 =	5.56 =	226 =	663 =	897.79
P1-MW-22	AN22B2	1/17/2007	35.5 =	12.5 =	55.1 =	2,000 =	2,103.10
P1-MW-23	AN23B2	1/17/2007	**88.6 =**	9.18 J	189 =	1,530 =	1,816.70
P1-J1	ANJ128	1/17/2007	59.7 =	138 =	707 =	2,530 =	3,434.70
P1-J2	ANJ228	1/17/2007	**245 =**	1,480 =	1,420 =	5,860 =	9,005
P1-CPT-09	AP0928	1/23/2007	***785 =***	23,400 =	1,540 =	6,660 =	32,385
P1-J4	ANJ428	1/22/2007	***1,160 =***	20,800 =	1,600 =	6,230 =	29,790
P1-J5	ANJ528	1/17/2007	***379 =***	14,100 =	1,590 =	6,040 =	22,109
P1-J6	ANJ628	1/22/2007	68 **=**	248 =	326 =	514 =	1,156
Performance Monitoring Event – April 2007							
D-MW-05R	AK05C2	4/21/2007	***3,870 J***	292 =	1,320 J	4,190 =	9,672
P1-MW-02	AN02C2	4/21/2007	***525 =***	17,800 =	1,780 =	6,380 =	26,485
P1-MW-21	AN21C2	4/21/2007	2.14 =	6.35 =	334 =	401 =	743.49
P1-MW-22	AN22C2	4/21/2007	26.5 =	3 =	51.4 =	4,580 =	4,660.90
Eleventh Semiannual Monitoring Event (Release #2) – July 2007							
D-MW-05R	AK05D2	7/14/2007	***2,520 J***	189 J	692 J	3,800 J	7201
D-MW-06R	AK06D2	7/13/2007	49.5 =	18.8 J	371 =	3,070 =	3509.3
P1-MW-01	AN01D2	7/13/2007	7.77 =	962 J	683 J	3,650 J	5302.77
P1-MW-02	AN02D2	7/19/2007	**163 =**	6,380 =	997 =	4,020 =	11560
P1-MW-03	AN03D2	7/15/2007	**184 J**	1,260 J	843 J	5,990 J	8277
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

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Eleventh Semiannual Monitoring Event (Release #2) – July 2007							
P1-MW-17	AN17D2	7/15/2007	1 U	1 U	1 U	1.52 =	1.52
P1-MW-18	AN18D2	7/15/2007	2 U	38.6 =	55.7 =	331 =	425.3
P1-MW-19	AN19D2	7/14/2007	***452 =***	4,050 =	1750 =	6,910 =	13162
P1-MW-20	AN20D2	7/15/2007	0.319 J	1.18 U	0.301 J	2.52 =	3.14
P1-MW-22	AN22D2	7/14/2007	18.1 =	12.7 U	60.5 =	3,000 =	3078.6
P1-MW-23	AN23D2	7/14/2007	27.5 =	5.74 =	175 =	896 =	1104.24
P1-MW-36	AN36D2	7/15/2007	1 U	1 U	1 U	0.374 J	0.374
P1-MW-40	AN40D2	7/15/2007	17.2 =	1.46 U	4.37 =	48.4 =	69.97
P1-CPT-07	AP0738	7/15/2007	***728 J***	1,770 J	560 J	2,110 J	5168
P1-CPT-17	AP1738	7/15/2007	***906 =***	12,000 =	579 =	2,700 =	16185
P1-CPT-19	AP1938	7/15/2007	***1,830 =***	3,910 =	298 =	2,270 =	8308
P1-CPT-22	AP2238	7/15/2007	***471 =***	989 =	186 =	1,310 =	2956
P1-SWS-11	AN1119	7/19/2007	***357 =***	11,900 =	1,640 =	8,990 =	8308
P1-SWS-12	AN1219	7/19/2007	***0.457 J =***	1 U	0.255 J	4.25 =	2956
Twelfth Semiannual Monitoring Event (Release #2) – January 2008							
D-MW-05R	AK05E2	1/28/2008	***3,760 =***	148 =	596 =	4,460 =	8,964
D-MW-06R	AK06E2	1/28/2008	**109 =**	49.6 =	657 =	3,920 =	4,735.60
P1-MW-01	AN01E2	1/28/2008	2.14 =	1,590 =	1,580 =	9,680 =	12,852
P1-MW-02	AN02E2	1/28/2008	***457 =***	13,800 =	1,450 =	6,050 =	21,757
P1-MW-19	AN19E2	1/28/2008	***461 =***	1,620 =	1,380 =	5,640 =	9,101
P1-MW-21	AN21E2	1/28/2008	0.567 J	9.45 U	361 =	811 =	1172
P1-MW-22	AN22E2	1/28/2008	32.6 =	6.81 U	28.1 =	2,190 =	2,250.70
P1-MW-23	AN23E2	1/28/2008	**72.1 =**	36.9 =	495 =	1,940 =	2,544
Supplemental Investigation (Release #2) – January 2008							
P1-DB-01	AN0128	1/11/2008	20.7 =	22.8 =	7.95 =	96.1 =	147.55
P1-DB-02	AN0228	1/11/2008	16.7 =	14.2 =	27.4 =	94 =	152.3
P1-DB-03	AN0328	1/12/2008	15.2 =	5.88 =	189 =	815 =	1,025.08
P1-DB-04	AN0428	1/13/2008	***514 =***	4,420 J	937 =	3,330 =	9,201
P1-DB-05	AN0528	1/12/2008	***1,910 =***	11,200 =	752 =	2,700 =	16,562
P1-DB-06	AN0628	1/12/2008	***2,200 =***	1,860 =	1,190 =	4,170 =	9,420
P1-DB-07	AN0728	1/12/2008	***333 =***	1,070 =	363 =	1,070 =	2,836
P1-DB-08	AN0828	1/12/2008	***588 =***	556 =	1,210 =	4,570 =	6,924
P1-DB-09	AN0928	1/13/2008	1 U	3.71 =	1.2 =	4.48 =	9.39
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

Source: Sixth Annual Monitoring Only Report (SAIC, 2008)

Notes:

Bold values exceed IWQS

Italics values exceed alternate threshold limits

ug/L - microgram per Liter

BTEX - Benzene, toulene, ethylbenzene, and xylenes

NRC - No regulatory Criteria

MTBE - Methyl tert-butyl ether

Laboratory Qualifiers:

U - Indicates the compound was not detected at the concentration reported

J - Indicates the value of the compound is an estimated value

= - Indicates the compound was detected at the concentration reported

Table 3-3
Historical Groundwater Analytical Results
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Supplemental Investigation (Release #2) – January 2008							
P1-DB-10	AN1028	1/13/2008	**280 =**	1,060 J	721 =	2,390 =	4,451
P1-DB-11	AN1128	1/13/2008	5.01 J	0.656 J	9.03 J	10.2 J	24.896
P1-DB-12	AN1228	1/13/2008	**280 =**	915 =	1,550 J	4,540 =	7,285
P1-DB-13	AN1328	1/11/2008	***1,210 =***	14,300 =	1,160 =	3,820 =	20,490
P1-DB-14	AN1428	1/11/2008	**116 =**	84.9 =	612 =	1,830 =	2,642.90
P1-DB-15	AN1528	1/14/2008	7.06 =	2,030 =	858 =	4,460 =	7,355.06
P1-DB-16	AN1628	1/14/2008	9.13 =	297 =	384 =	2,040 =	2,730.13
P1-DB-17	AN1728	1/14/2008	5.51 =	1,020 =	1,210 =	6,980 =	9,215.51
P1-DB-18	AN1828	1/14/2008	***810 =***	25,400 =	1,480 =	5,650 =	33,340
P1-DB-19	AN1928	1/11/2008	***463 =***	6,440 =	1,230 =	4,130 =	12,263
P1-DB-20	AN2028	1/10/2008	63 =	12,200 =	1,360 =	5,470 =	19,093
P1-DB-21	AN2128	1/10/2008	**188 =**	8,930 =	1,020 =	4,410 =	14,548
P1-DB-22	AN2228	1/10/2008	***915 =***	19,800 =	1,380 =	6,030 =	28,125
P1-DB-23	AN2328	1/11/2008	***1,160 =***	22,100 =	1,180 =	3,990 =	28,430
P1-DB-24	AN2428	1/10/2008	40.1 =	11,700 =	1,420 =	5,670 =	18,830.10
P1-DB-25	AN2528	1/10/2008	2.08 =	4.15 =	9.01 =	8.63 =	23.87
P1-DB-26	AN2628	1/10/2008	1.71 =	11.5 =	54.1 J	191 J	258.31
P1-DB-27	AN2728	1/10/2008	0.424 J	163 =	227 =	1,500 =	1,890.42
P1-DB-28	AN2828	1/10/2008	**120 =**	5,020 =	1,520 =	7,990 =	14,650
P1-DB-29	AN2928	1/10/2008	28.6 =	2,510 =	1,070 =	4,910 =	8,518.60
P1-DB-30	AN3028	1/9/2008	2.21 =	2,500 =	1,630 =	8,640 =	12,772.21
P1-DB-31	AN3128	1/9/2008	25.5 =	3,130 =	1,570 =	8,630 =	13,355.50
P1-DB-32	AN3228	1/9/2008	7.18 =	1,500 =	1,380 =	5,840 =	8,727.18
P1-DB-33	AN3328	1/9/2008	2.7 =	2,520 =	884 =	5,000 =	8,406.70
P1-DB-34	AN3428	1/9/2008	1 U	1,670 =	1,630 =	8,210 =	11,510
P1-DB-35	AN3528	1/9/2008	***598 =***	11,700 =	1,470 =	6,000 =	19,768
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6)			71	200,000	29,000	NRC	NRC
Alternate Concentration Limit			285	800,000	114,800	—	—

Source: Sixth Annual Monitoring Only Report (SAIC, 2008)

Notes:

Bold values exceed IWQS

Italics values exceed alternate threshold limits

ug/L - microgram per Liter

BTEX - Benzene, toulene, ethylbenzene, and xylenes

NRC - No regulatory Criteria

MTBE - Methyl tert-butyl ether

Laboratory Qualifiers:

U - Indicates the compound was not detected at the concentration reported

J - Indicates the value of the compound is an estimated value

= - Indicates the compound was detected at the concentration reported

Table 3-3
Historical Groundwater Analytical Results
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)
Thirteenth Semiannual Monitoring Event (Release #2) – July 2008							
D-MW-05R	AK05F2	7/16/2008	*2,090=*	65.1=	568=	3,110=	5,833
D-MW-06R	AK06F2	7/16/2008	44.4=	28.2=	890=	4,280=	5,242.6
P1-MW-01	AN01F2	7/16/2008	6.02=	1,330=	2,000=	9,080=	12,416.02
P1-MW-02	AN02F2	7/16/2008	*614=*	**17,200=**	**2,200=**	8,970=	29,004
P1-MW-19	AN19F2	7/16/2008	*518=*	1,490=	1,630=	6,630=	10,268
P1-MW-21	AN21F2	1/28/2008	2.98=	1.37=	249=	622=	875.35
P1-MW-22	AN22F2	7/16/2008	24.6=	7.32=	77.8=	4,650=	4,759.72
P1-MW-23	AN23F2	7/16/2008	**71=**	10.6=	144=	1,280=	1,505.6
Fourteenth Semiannual Monitoring Event (Release #2) – December 2008							
D-MW-05R	D-MW-05R (121708)	12/17/2008	***1,700***	74	290	1,800 J	3,864
D-MW-06R	D-MW-06R (121708)	12/17/2008	**84**	34	510	2,500 J	3,128
P1-MW-01	P1-MW-01 (121708)	12/17/2008	10 U	1,100	1,700	8,600 J	11,400
P1-MW-02	P1-MW-02 (121708)	12/17/2008	***520***	**16,000**	1,700	6,900 J	25,120
P1-MW-18	P1-MW-18 (121708)	12/17/2008	0.5 U	1.2	7.7	13 J	22
P1-MW-19	P1-MW-19 (121708)	12/17/2008	***420***	1,300	1,700	6,500 J	9,920
P1-MW-22	P1-MW-22 (121708)	12/17/2008	29	18	95	3,900 J	4,042
P1-MW-23	P1-MW-23 (121708)	12/17/2008	**88**	17	180	1,500 J	1,785
P1-SWS-11	P1-SWS-11 (121808)	12/18/2008	24	51	26	370	471
P1-SWS-12	P1-SWS-12 (121808)	12/18/2008	2.4	16	33	88	139

Sample Location	Sample ID	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Total BTEX (µg/L)	MTBE (µg/L)
Fifteenth Semiannual Monitoring Event (Release #2) – June 2009								
D-MW-05R	D-MW-05R (060309)	6/3/2009	***4,100***	110	660	5,100	9,970	25 U
D-MW-06R	D-MW-06R (060409)	6/4/2009	**100**	44	510	3,900	4,554	25 U
P1-CPT-07	P1-CPT-07 (060309)	6/3/2009	***1,400***	5,600	880	2,800	10,680	50 U
P1-MW-01	P1-MW-01 (060409)	6/4/2009	50 U	650	1,800	12,000	14,450	50 U
P1-MW-02	P1-MW-02 (060309)	6/3/2009	***610***	**17,000**	2,100	8,400	28,110	50 U
P1-MW-03	P1-MW-03 (060409)	6/4/2009	**92**	3,100	1,700	8,100	12,992	25 U
P1-MW-17	P1-MW-17 (060309)	6/3/2009	0.5 U	0.5 U	0.5 U	0.5 U	ND	0.5 U
P1-MW-19	P1-MW-19 (060409)	6/4/2009	***730***	390	1,700	6,600	9,420	25 U
P1-MW-20	P1-MW-20 (060309)	6/3/2009	0.5 U	0.5 U	0.5 U	0.5 U	ND	0.5 U
P1-MW-21	P1-MW-21 (060509)	6/5/2009	10 U	74	1,100	4,400	5,574	10 U
P1-MW-22	P1-MW-22 (060409)	6/4/2009	26	72	190	4,000	4,288	25 U
P1-MW-23	P1-MW-23 (060409)	6/4/2009	**61**	20	200	1,500	1,781	5 U
In-Stream Water Quality Standard (GA EPD Chapter 391-3-6) **Revised 2009**			51	5,980	2,100	NRC	NRC	—
Alternate Concentration Limit			285	800,000	114,800	—	—	—

Notes:

Bold values exceed IWQS

Italics values exceed alternate threshold limits

ug/L - microgram per Liter

BTEX - Benzene, toulene, ethylbenzene, and xylenes

NRC - No regulatory Criteria

MTBE - Methyl tert-butyl ether

Laboratory Qualifiers:

U - Indicates the compound was not detected at the concentration reported

J - Indicates the value of the compound is an estimated value

= - Indicates the compound was detected at the concentration reported

Table 3-4
Biogeochemical Parameters - June 2009
Fifteenth Semi-Annual Monitoring Report with Addendum to Revised Corrective Acton Plan-Part B
Former Pumphouse #1 (Release #2)
Former Building 8060
Hunter Army Airfield, Georgia

	Location ID	D-MW-05R	P1-CPT-07	P1-MW-02	P1-MW-03	P1-MW-17	P1-MW-20
	Sample Date	6/3/2009	6/3/2009	6/3/2009	6/4/2009	6/3/2009	6/3/2009
Chemical Name	Unit						
Metals							
Iron (dissovled)	mg/L	0.4	1	1.4	2	0.54	< 0.1
Iron (total)	mg/L	0.41	1.5	1.8	2	1.1	0.034 J
Manganese	mg/L	0.016	0.024	0.032	0.1	< 0.015	0.025
Biogeochemical							
Sulfate	mg/L	0.14 UB	1.6	0.19 UB	0.17 J	5.5	11
Nitrate	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	0.013 J	0.52
Alkalinity	mg/L	72	22	21	30	13	< 10
Total Dissolved Solids	mg/L	160	89	100	70	74	62
Total Suspended Solids	mg/L	1.2 J	42	14	6	25	< 1
Total Organic Carbon	mg/L	47	25	34	37	9.5	3.4
Chemical Oxygen Demand	mg/L	170	100	160	150	28	18

Notes:
mg/L - miligram per Liter
ug/L - microgram per Liter
J - Estimated result
-- Not Analyzed
U - Not detected at concentration reported
B - Constituent detected in blank

ARCADIS

Appendix C

Laboratory Analytical Results

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Chain of Custody Record

Number 102284

Client: Arcadis	Report to Contact: Scott Bastian	Telephone No. / Fax No. / E-mail: 770-431-8666 / 770-435-2666	Quote No.
Address: 2849 Paces Ferry Rd Ste 400	Sampler's Signature: x Cecilia Bell	Waybill No.	Page 1 of 1
City: Atlanta / State: GA / Zip Code: 30339	Printed Name: Cecilia Bell	Analysis (Attach list if more space is needed.)	
Project Name: HAA13 Pumphouse 1 Release2			
Project No.: GP08HAFS.H13A.NIR2	P.O. No.		Lot No. KF06023

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	BTEX/MTBE	Remarks / Cooler I.D.
P1-MW21 (060509)	6/5/09	935	G	X						3			X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Cecilia Bell	6/5/09		1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by: FedEx	6/6/09	0930	3. Laboratory received by: Scott Mills	6/6/09	0930

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. 5.2 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY ENVIRONMENTAL SERVICES, INC.

SHEALY **Chain of Custody Record**

106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 102280

Client: Arcadis	Report to Contact	Telephone No. / Fax No. / E-mail: 770-431-8600 / 770-435-2606
Address: 2849 Paces Ferry Rd Ste 400	Sampler's Signature: x Cecilia Bell	Waybill No.
City: Atlanta / State: GA / Zip Code: 30339	Printed Name: Cecilia Bell	Quote No. / Page 1 of 1
Project Name: HAA-13 Pumphouse 1 Release 2		
Project No.: GP08HAFS, H13A, N1R2	P.O. No.	Analysis (Attach list if more space is needed.)

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	BTEX/MTBE	Dissolved Iron	Manganese/Iron	COD/TOC	TDS/TSS/Alk/Nitrate/Sulfate	Lot No. / Remarks / Cooler I.D.
P1-MW1 (060409)	6/4/09	1530	G	X									✓					KF05012
P1-MW16R (060409)	6/4/09	1610	1	X									✓					
P1-MW3 (060409)	6/4/09	1655		X			2	1	1	3			✓	✓	✓	✓	✓	
P1-MW19 (060409)	6/4/09	1350		X									✓					
P1-MW22 (060409)	6/4/09	1150		X									✓					
~~P1-MW23 (060309)~~	~~6/3/09~~			X									✓					
TB01 (060409)	6/4/09																	

CBell

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by			1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by: FEDEX	060509	0930	3. Laboratory received by: Sabrina Boles	060509	0930

Comments

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. 5.0 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Chain of Custody Record

Number 102135

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / Fax No. / E-mail: 770-431-8666 / 770-435-2666	Quote No.: 11954
Address: 2849 Paces Ferry Rd	Sampler's Signature: x Erica Maddox	Waybill No.	Page 1 of 1
City: Atlanta / State: GA / Zip Code: 30339	Printed Name: Erica Maddox / Cecil Ra Bel	Analysis (Attach list if more space is needed.)	
Project Name: HAA-13 Pumphouse 1 Release 2			
Project No.: GP08HAFS. H13A. N1R2	P.O. No.		Lot No.: KF04042

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	BTEX / MTBE	Dissolved Iron	Manganese / Iron	COD / TOC	TDS / TSS / Alk / Nitrate / Sulfate	Remarks / Cooler I.D.
P1 - MW20 (060309)	6/3/09	1045	G	x			2	1	1	3			✓	✓	✓	✓	✓	
D - MW5R (060309		1650	G	x			2	1	1	3			✓	✓	✓	✓	✓	
TB-01 (060309)	↓	1000	G	x						2			✓					

Erica Maddox

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Erica Maddox	6/3/09	1930	1. Received by		
2. Relinquished by			2. Received by	DUP 6/4/09	
3. Relinquished by: FEDEX	6-4-09	0930	3. Laboratory received by	6/3/09	9930

Comments

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack
6-4-09 Receipt Temp. 2.0 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

SHEALY **Chain of Custody Record**

Number 102136

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / Fax No. / E-mail: 770-431-8666 / 770-435-2666	Quote No.
Address: 2849 Paces Ferry Rd	Sampler's Signature: x Erica Maddox	Waybill No.	Page 1 of 1
City: Atlanta / State: GA / Zip Code: 30339	Printed Name: Erica Maddox / Cecilia Bell	Analysis (Attach list if more space is needed.)	
Project Name: HAA-13 Pumphouse 1, Release 2			
Project No.: EPDB HAFS, HBA, NIR2	P.O. No.		Lot No.: KF04017

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	BTEX, MTBE	Dissolved Iron	Iron, Manganese	COD, TOC	TDS, TSS, Alk, Chloride, Sulfate	Remarks / Cooler I.D.
P1-MW2(060309)	6/3/09	1300	G	X			3	1	1	3			✓	✓	✓	✓	✓	
P1-CPT7(060309		1740	G	X			3	1	1	3			✓	✓	✓	✓	✓	
P1-MW17(060309)		1700	G	X			3	1	1	3			✓	✓	✓	✓	✓	
TB-02(060309)		1000	G	X						2			✓					

Erica Maddox

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Erica Maddox	6/3/09	1930	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by: FedEx 6	6-4-09	0940	3. Laboratory received by: 6-	6-4-09	0940

Comments

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack
Receipt Temp. 3.4 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

ARCADIS U.S., Inc.
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Janet Christy

Project Name: **HAA-13 Pumphouse 1, Release 2**

Project Number: **GP08HAFS.H1BA.N1R2**

Lot Number: **KF04017**

Date Completed: **06/17/2009**

Nisreen Saikaly
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* K F 0 4 0 1 7 *

Case Narrative
ARCADIS U.S., Inc.
Lot Number: KF04017

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Nitrate - N

The MS/MSD recoveries in batch 11859 were outside acceptance criteria. All other QA/QC criteria for the batch were within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Sample Summary
ARCADIS U.S., Inc.
Lot Number: KF04017

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	P1-MW1 (060309)	Aqueous	06/03/2009 1300	06/04/2009
002	P1-CPT7 (060309)	Aqueous	06/03/2009 1740	06/04/2009
003	P1-MW17 (060309)	Aqueous	06/03/2009 1700	06/04/2009
004	TB-02 (060309)	Aqueous	06/03/2009 1000	06/04/2009

(4 samples)

Executive Summary
ARCADIS U.S., Inc.
Lot Number: KF04017

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	P1-MW1 (060309)	Aqueous	Alkalinity	SM 2320B	21		mg/L	5
001	P1-MW1 (060309)	Aqueous	COD	SM 5220D	160		mg/L	5
001	P1-MW1 (060309)	Aqueous	Sulfate	300.0	0.19	BJ	mg/L	5
001	P1-MW1 (060309)	Aqueous	TDS	SM 2540C	100		mg/L	5
001	P1-MW1 (060309)	Aqueous	TOC	SM 5310D	34		mg/L	5
001	P1-MW1 (060309)	Aqueous	TSS	SM 2540D	14		mg/L	5
001	P1-MW1 (060309)	Aqueous	Benzene	8260B	610		ug/L	6
001	P1-MW1 (060309)	Aqueous	Ethylbenzene	8260B	2100		ug/L	6
001	P1-MW1 (060309)	Aqueous	Toluene	8260B	17000		ug/L	6
001	P1-MW1 (060309)	Aqueous	Xylenes (total)	8260B	8400		ug/L	6
001	P1-MW1 (060309)	Aqueous	Dissolved Iron	6010B	1.4		mg/L	7
001	P1-MW1 (060309)	Aqueous	Iron	6010B	1.8		mg/L	8
001	P1-MW1 (060309)	Aqueous	Manganese	6010B	0.032		mg/L	8
002	P1-CPT7 (060309)	Aqueous	Alkalinity	SM 2320B	22		mg/L	9
002	P1-CPT7 (060309)	Aqueous	COD	SM 5220D	100		mg/L	9
002	P1-CPT7 (060309)	Aqueous	Sulfate	300.0	1.6	B	mg/L	9
002	P1-CPT7 (060309)	Aqueous	TDS	SM 2540C	89		mg/L	9
002	P1-CPT7 (060309)	Aqueous	TOC	SM 5310D	25		mg/L	9
002	P1-CPT7 (060309)	Aqueous	TSS	SM 2540D	42		mg/L	9
002	P1-CPT7 (060309)	Aqueous	Benzene	8260B	1400		ug/L	10
002	P1-CPT7 (060309)	Aqueous	Ethylbenzene	8260B	880		ug/L	10
002	P1-CPT7 (060309)	Aqueous	Toluene	8260B	5600		ug/L	10
002	P1-CPT7 (060309)	Aqueous	Xylenes (total)	8260B	2800		ug/L	10
002	P1-CPT7 (060309)	Aqueous	Dissolved Iron	6010B	1.0		mg/L	11
002	P1-CPT7 (060309)	Aqueous	Iron	6010B	1.5		mg/L	12
002	P1-CPT7 (060309)	Aqueous	Manganese	6010B	0.024		mg/L	12
003	P1-MW17 (060309)	Aqueous	Alkalinity	SM 2320B	13		mg/L	13
003	P1-MW17 (060309)	Aqueous	COD	SM 5220D	28		mg/L	13
003	P1-MW17 (060309)	Aqueous	Nitrate - N	353.2	0.013	J	mg/L	13
003	P1-MW17 (060309)	Aqueous	Sulfate	300.0	5.5	B	mg/L	13
003	P1-MW17 (060309)	Aqueous	TDS	SM 2540C	74		mg/L	13
003	P1-MW17 (060309)	Aqueous	TOC	SM 5310D	9.5		mg/L	13
003	P1-MW17 (060309)	Aqueous	TSS	SM 2540D	25		mg/L	13
003	P1-MW17 (060309)	Aqueous	Dissolved Iron	6010B	0.54		mg/L	15
003	P1-MW17 (060309)	Aqueous	Iron	6010B	1.1		mg/L	16

(35 detections)

Inorganic non-metals

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-001**
Description: **P1-MW1 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1300**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) SM 2320B	1	06/05/2009 1351	PMM		11868
1		(COD) SM 5220D	1	06/10/2009 0915	RLM	06/09/2009 1445	
1		(Nitrate - N) 353.2	1	06/04/2009 1709	WD		11859
1		(Sulfate) 300.0	1	06/16/2009 1639	DAS		12602
1		(TDS) SM 2540C	1	06/09/2009 2039	HBB		12122
1		(TOC) SM 5310D	1	06/09/2009 2330	PMM		12117
1		(TSS) SM 2540D	1	06/09/2009 1730	HBB		12044

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Alkalinity		**SM 2320B**	**21**		**10**	**3.9**	**mg/L**	**1**
COD		**SM 5220D**	**160**		**10**	**5.7**	**mg/L**	**1**
Nitrate - N		353.2	ND		0.020	0.0013	mg/L	1
Sulfate		**300.0**	**0.19**	**BJ**	**1.0**	**0.13**	**mg/L**	**1**
TDS		**SM 2540C**	**100**		**10**	**3.4**	**mg/L**	**1**
TOC		**SM 5310D**	**34**		**1.0**	**0.063**	**mg/L**	**1**
TSS		**SM 2540D**	**14**		**5.0**	**0.34**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-001**
Description: **P1-MW1 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1300**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	100	06/06/2009 0457	DLB		11990

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	**71-43-2**	**8260B**	**610**		**50**	**2.7**	**ug/L**	**1**
Ethylbenzene	**100-41-4**	**8260B**	**2100**		**50**	**17**	**ug/L**	**1**
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		50	1.9	ug/L	1
Toluene	**108-88-3**	**8260B**	**17000**		**50**	**17**	**ug/L**	**1**
Xylenes (total)	**1330-20-7**	**8260B**	**8400**		**50**	**17**	**ug/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		109	52-138
Bromofluorobenzene		99	70-147
Toluene-d8		109	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-001**
Description: **P1-MW1 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1300**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/10/2009 0018	CDF	06/08/2009 1925	12054

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Iron	**7439-89-6**	**6010B**	**1.4**		**0.10**	**0.023**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-001**
Description: **P1-MW1 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1300**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0418	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Iron	**7439-89-6**	**6010B**	**1.8**		**0.10**	**0.023**	**mg/L**	**1**
Manganese	**7439-96-5**	**6010B**	**0.032**		**0.015**	**0.0049**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Inorganic non-metals

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-002**
Description: **P1-CPT7 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1740**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) SM 2320B	1	06/05/2009 1403	PMM		11868
1		(COD) SM 5220D	1	06/10/2009 0915	RLM	06/09/2009 1445	
1		(Nitrate - N) 353.2	1	06/04/2009 1710	WD		11859
1		(Sulfate) 300.0	1	06/16/2009 1701	DAS		12602
1		(TDS) SM 2540C	1	06/09/2009 2039	HBB		12122
1		(TOC) SM 5310D	1	06/09/2009 2351	PMM		12117
1		(TSS) SM 2540D	1	06/09/2009 1730	HBB		12044

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Alkalinity		**SM 2320B**	**22**		**10**	**3.9**	**mg/L**	**1**
COD		**SM 5220D**	**100**		**10**	**5.7**	**mg/L**	**1**
Nitrate - N		353.2	ND		0.020	0.0013	mg/L	1
Sulfate		**300.0**	**1.6**	**B**	**1.0**	**0.13**	**mg/L**	**1**
TDS		**SM 2540C**	**89**		**10**	**3.4**	**mg/L**	**1**
TOC		**SM 5310D**	**25**		**1.0**	**0.063**	**mg/L**	**1**
TSS		**SM 2540D**	**42**		**10**	**0.34**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-002**
Description: **P1-CPT7 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1740**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	100	06/06/2009 0518	DLB		11990

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	**71-43-2**	**8260B**	**1400**		**50**	**2.7**	**ug/L**	**1**
Ethylbenzene	**100-41-4**	**8260B**	**880**		**50**	**17**	**ug/L**	**1**
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		50	1.9	ug/L	1
Toluene	**108-88-3**	**8260B**	**5600**		**50**	**17**	**ug/L**	**1**
Xylenes (total)	**1330-20-7**	**8260B**	**2800**		**50**	**17**	**ug/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		110	52-138
Bromofluorobenzene		98	70-147
Toluene-d8		108	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-002**
Description: **P1-CPT7 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1740**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/10/2009 0023	CDF	06/08/2009 1925	12054

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Iron	**7439-89-6**	**6010B**	**1.0**		**0.10**	**0.023**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-002**
Description: **P1-CPT7 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1740**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0423	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Iron	**7439-89-6**	**6010B**	**1.5**		**0.10**	**0.023**	**mg/L**	**1**
Manganese	**7439-96-5**	**6010B**	**0.024**		**0.015**	**0.0049**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Inorganic non-metals

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-003**
Description: **P1-MW17 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1700**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) SM 2320B	1	06/05/2009 1416	PMM		11868
1		(COD) SM 5220D	1	06/10/2009 1515	RLM	06/10/2009 1055	
1		(Nitrate - N) 353.2	1	06/04/2009 1711	WD		11859
1		(Sulfate) 300.0	1	06/16/2009 1723	DAS		12602
1		(TDS) SM 2540C	1	06/09/2009 2039	HBB		12122
1		(TOC) SM 5310D	1	06/10/2009 0012	PMM		12117
1		(TSS) SM 2540D	1	06/09/2009 1730	HBB		12044

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Alkalinity		**SM 2320B**	**13**		**10**	**3.9**	**mg/L**	**1**
COD		**SM 5220D**	**28**		**10**	**5.7**	**mg/L**	**1**
Nitrate - N		**353.2**	**0.013**	**J**	**0.020**	**0.0013**	**mg/L**	**1**
Sulfate		**300.0**	**5.5**	**B**	**1.0**	**0.13**	**mg/L**	**1**
TDS		**SM 2540C**	**74**		**10**	**3.4**	**mg/L**	**1**
TOC		**SM 5310D**	**9.5**		**1.0**	**0.063**	**mg/L**	**1**
TSS		**SM 2540D**	**25**		**3.3**	**0.34**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-003**
Description: **P1-MW17 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1700**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	06/06/2009 0228	DLB		11990

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	ND		0.50	0.027	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		0.50	0.17	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		0.50	0.019	ug/L	1
Toluene	108-88-3	8260B	ND		0.50	0.17	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		0.50	0.17	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		106	52-138
Bromofluorobenzene		96	70-147
Toluene-d8		107	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-003**
Description: **P1-MW17 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1700**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/10/2009 0028	CDF	06/08/2009 1925	12054

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Iron	**7439-89-6**	**6010B**	**0.54**		**0.10**	**0.023**	**mg/L**	**1**

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-003**
Description: **P1-MW17 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1700**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0428	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Iron	**7439-89-6**	**6010B**	**1.1**		**0.10**	**0.023**	**mg/L**	**1**
Manganese	7439-96-5	6010B	ND		0.015	0.0049	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: **ARCADIS U.S., Inc.**
Laboratory ID: **KF04017-004**
Description: **TB-02 (060309)**
Matrix: **Aqueous**
Date Sampled: **06/03/2009 1000**
Date Received: **06/04/2009**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	06/06/2009 0249	DLB		11990

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	ND		0.50	0.027	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		0.50	0.17	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		0.50	0.019	ug/L	1
Toluene	108-88-3	8260B	ND		0.50	0.17	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		0.50	0.17	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		111	52-138
Bromofluorobenzene		96	70-147
Toluene-d8		110	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

QC Summary

Inorganic non-metals - MB

Sample ID: KQ11859-001
Batch: 11859
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Nitrate - N	ND		1	0.020	0.0013	mg/L	06/05/2009 1030

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ11859-002
Batch: 11859
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate - N	0.80	0.84		1	106	90-110	06/05/2009 1031

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ11859-003 **Matrix:** Aqueous
Batch: 11859
Analytical Method: 353.2

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate - N	0.80	0.85		1	106	0.35	90-110	20	06/05/2009 1033

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: KF04017-002MS
Batch: 11859
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate - N	ND	0.80	0.64	N	1	80	90-110	06/05/2009 1047

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: KF04017-002MD
Batch: 11859
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate - N	ND	0.80	0.63	N	1	79	0.63	90-110	20	06/05/2009 1048

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ11868-001
Batch: 11868
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Alkalinity	ND		1	10	3.9	mg/L	06/05/2009 0934

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ11868-002
Batch: 11868
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Alkalinity	100	100		1	100	90-110	06/05/2009 0951

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ11868-003 **Matrix:** Aqueous
Batch: 11868
Analytical Method: SM 2320B

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Alkalinity	100	100		1	101	0.54	90-110	20	06/05/2009 1008

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12044-001
Batch: 12044
Analytical Method: SM 2540D
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TSS	ND		1	1.0	0.34	mg/L	06/09/2009 1730

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12044-002
Batch: 12044
Analytical Method: SM 2540D
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TSS	500	490		1	98	90-110	06/09/2009 1730

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12117-001
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TOC	ND		1	1.0	0.063	mg/L	06/09/2009 2147

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12117-002
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TOC	20	20		1	101	90-110	06/09/2009 2208

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12117-003 **Matrix:** Aqueous
Batch: 12117
Analytical Method: SM 5310D

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
TOC	20	20		1	101	0.66	90-110	20	06/09/2009 2228

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12122-001
Batch: 12122
Analytical Method: SM 2540C
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TDS	ND		1	10	3.4	mg/L	06/09/2009 2039

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12122-002
Batch: 12122
Analytical Method: SM 2540C
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TDS	1500	1500		1	102	90-110	06/09/2009 2039

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12602-001
Batch: 12602
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Sulfate	**0.28**	**J**	**1**	**1.0**	**0.13**	**mg/L**	**06/16/2009 1447**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12602-002
Batch: 12602
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	20	21		1	103	90-110	06/16/2009 1509

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12602-003 **Matrix:** Aqueous
Batch: 12602
Analytical Method: 300.0

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Sulfate	20	20		1	98	5.5	90-110	20	06/16/2009 1531

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: KQ11990-001
Batch: 11990
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Benzene	ND		1	0.50	0.027	ug/L	06/05/2009 2316
Ethylbenzene	ND		1	0.50	0.17	ug/L	06/05/2009 2316
Methyl tertiary butyl ether (MTBE)	ND		1	0.50	0.019	ug/L	06/05/2009 2316
Toluene	ND		1	0.50	0.17	ug/L	06/05/2009 2316
Xylenes (total)	ND		1	0.50	0.17	ug/L	06/05/2009 2316

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		94	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		108	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: KQ11990-002
Batch: 11990
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Benzene	50	49		1	97	70-130	06/05/2009 2150
Ethylbenzene	50	48		1	97	70-130	06/05/2009 2150
Methyl tertiary butyl ether (MTBE)	50	48		1	97	70-130	06/05/2009 2150
Toluene	50	48		1	96	70-130	06/05/2009 2150
Xylenes (total)	100	96		1	96	70-130	06/05/2009 2150

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		100	70-130
1,2-Dichloroethane-d4		101	70-130
Toluene-d8		106	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCSD

Sample ID: KQ11990-003
Batch: 11990
Analytical Method: 8260B
Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Benzene	50	48		1	97	0.20	70-130	20	06/05/2009 2211
Ethylbenzene	50	47		1	94	3.1	70-130	20	06/05/2009 2211
Methyl tertiary butyl ether (MTBE)	50	48		1	97	0.19	70-130	20	06/05/2009 2211
Toluene	50	47		1	94	2.5	70-130	20	06/05/2009 2211
Xylenes (total)	100	94		1	94	1.8	70-130	20	06/05/2009 2211

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		100	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		108	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - MB

Sample ID: KQ12054-001
Batch: 12054
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/08/2009 1925

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Iron	ND		1	0.10	0.023	mg/L	06/09/2009 2212

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCS

Sample ID: KQ12054-002
Batch: 12054
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/08/2009 1925

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Iron	20	20		1	101	80-120	06/09/2009 2217

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCSD

Sample ID: KQ12054-003
Batch: 12054
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/08/2009 1925

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Dissolved Iron	20	20		1	101	0.28	80-120	20	06/09/2009 2222

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - MB

Sample ID: KQ12368-001
Batch: 12368
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Iron	ND		1	0.10	0.023	mg/L	06/16/2009 0402
Manganese	ND		1	0.015	0.0049	mg/L	06/16/2009 0402

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCS

Sample ID: KQ12368-002
Batch: 12368
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Iron	20	19		1	96	80-120	06/16/2009 0407
Manganese	2.0	1.9		1	93	80-120	06/16/2009 0407

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCSD

Sample ID: KQ12368-003
Batch: 12368
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Iron	20	20		1	98	2.5	80-120	20	06/16/2009 0413
Manganese	2.0	1.9		1	97	4.2	80-120	20	06/16/2009 0413

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

SHEALY

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 102136

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / Fax No. / E-mail: 770-431-8666 / 770-435-2666
Address: 2849 Paces Ferry Rd	Sampler's Signature: x Erica Maddox	Waybill No.:
City: Atlanta · State: GA · Zip Code: 30339	Printed Name: Erica Maddox / Cecilia Bell	Quote No.: · Page 1 of 1
Project Name: HAA-13 Pumphouse 1, Release 2		Lot No.: KF04017
Project No.: [?]PDB HAFS. HBA. NIR2	P.O. No.:	

Analysis (Attach list if more space is needed.)

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres	H_2SO_4	HNO_3	HCl	NaOH	8035 Kit	BTEX, MTBE	Dissolved Iron	Iron, Manganese	COD, TOC	TDS, TSS, Alk, Nitrate, Sulfate [?]	Remarks / Cooler I.D.
P1-MW2 (060309)	6/3/09	1300		X			3	1	1	3			✓	✓	✓	✓	✓	
P1-CPT7 (060309 [?]	↓	1740		X			3	1	1	3			✓	✓	✓	✓	✓	
P1-MW17 (060309)	↓	1700		X			3	1	1	3			✓	✓	✓	✓	✓	
TB-02 (060309)	↓	1000		X						2			✓					

Erica Maddox

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

QC Requirements (Specify):

1. Relinquished by: Erica Maddox	Date: 6/3/09	Time: 1930	1. Received by:	Date:	Time:
2. Relinquished by:	Date:	Time:	2. Received by:	Date:	Time:
3. Relinquished by: Fed Ex	Date: 6-4-09	Time: 0940	3. Laboratory received by: [illegible]	Date: 6-4-09	Time: 0940
Comments:			LAB USE ONLY. Received on ice (Circle): (Yes) No Ice Pack	Receipt Temp. 3.4 °C	

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 6

Page 1 of 1
Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: EA 6/4/09 Lot #: KF04017

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other

Yes	No	NA	Question
Yes ☑	No ☐	NA ☐	1. Were custody seals present on the cooler?
Yes ☑	No ☐	NA ☐	2. If custody seals were present, were they intact and unbroken?

Cooler ID/temperature upon receipt 3 / 4 °C ___/___ °C ___/___ °C ___/___ °C
___/___ °C ___/___ °C ___/___ °C ___/___ °C

Method: ☐ Temperature Blank ☑ Against Bottles
Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes	No	NA	Question
Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other:________. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☑	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☐	No ☑	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☐	No ☑	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s)________ were received incorrectly preserved and were adjusted accordingly in sample receiving with ________ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number) ________

Sample(s)________ were received with bubbles >6 mm in diameter.

Sample(s)________ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s)________ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Date 6/3/09 FedEx Tracking Number 865594008615

Sender's Name ARCADIS INC. Phone 770 431-8666
Company ARCADIS
Address 2849 PACES FERRY RD SE STE 400
City ATLANTA State GA ZIP 30339-3769
Your Internal Billing Reference GP09 HGFC H091 ...

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐
SESI employee:
Comments: COD / TOC for -002 poured into H_2SO_4 bottle @ S.R.
EA

Report of Analysis

ARCADIS U.S., Inc.
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Janet Christy

Project Name: HAA-13 Pumphouse 1 Release 2

Project Number: GP08HAFS.H13A.N1R2

Lot Number: KF04042

Date Completed: 06/17/2009

Nisreen Saikaly
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* K F 0 4 0 4 2 *

Case Narrative
ARCADIS U.S., Inc.
Lot Number: KF04042

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
ARCADIS U.S., Inc.
Lot Number: KF04042

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	P1-MW20 (060309)	Aqueous	06/03/2009 1045	06/04/2009
002	D-MW5R (060309)	Aqueous	06/03/2009 1650	06/04/2009
003	TB-01 (060309)	Aqueous	06/03/2009 1000	06/04/2009

(3 samples)

Executive Summary

ARCADIS U.S., Inc.

Lot Number: KF04042

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	P1-MW20 (060309)	Aqueous	COD	SM 5220D	18		mg/L	5
001	P1-MW20 (060309)	Aqueous	Nitrate - N	353.2	0.52		mg/L	5
001	P1-MW20 (060309)	Aqueous	Sulfate	300.0	11	B	mg/L	5
001	P1-MW20 (060309)	Aqueous	TDS	SM 2540C	62		mg/L	5
001	P1-MW20 (060309)	Aqueous	TOC	SM 5310D	3.4		mg/L	5
001	P1-MW20 (060309)	Aqueous	Iron	6010B	0.034	J	mg/L	8
001	P1-MW20 (060309)	Aqueous	Manganese	6010B	0.025		mg/L	8
002	D-MW5R (060309)	Aqueous	Alkalinity	SM 2320B	72		mg/L	9
002	D-MW5R (060309)	Aqueous	COD	SM 5220D	170		mg/L	9
002	D-MW5R (060309)	Aqueous	Sulfate	300.0	0.14	BJ	mg/L	9
002	D-MW5R (060309)	Aqueous	TDS	SM 2540C	160		mg/L	9
002	D-MW5R (060309)	Aqueous	TOC	SM 5310D	47		mg/L	9
002	D-MW5R (060309)	Aqueous	TSS	SM 2540D	1.2	J	mg/L	9
002	D-MW5R (060309)	Aqueous	Benzene	8260B	4100		ug/L	10
002	D-MW5R (060309)	Aqueous	Ethylbenzene	8260B	660		ug/L	10
002	D-MW5R (060309)	Aqueous	Toluene	8260B	110		ug/L	10
002	D-MW5R (060309)	Aqueous	Xylenes (total)	8260B	5100		ug/L	10
002	D-MW5R (060309)	Aqueous	Dissolved Iron	6010B	0.40		mg/L	11
002	D-MW5R (060309)	Aqueous	Iron	6010B	0.41		mg/L	12
002	D-MW5R (060309)	Aqueous	Manganese	6010B	0.016		mg/L	12

(20 detections)

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-001
Description: P1-MW20 (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1045
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) SM 2320B	1	06/05/2009 1424	PMM		11868
1		(COD) SM 5220D	1	06/10/2009 1515	RLM	06/10/2009 1055	
1		(Nitrate - N) 353.2	1	06/05/2009 1034	WD		11924
1		(Sulfate) 300.0	1	06/16/2009 1554	DAS		12602
1		(TDS) SM 2540C	1	06/09/2009 2039	HBB		12122
1		(TOC) SM 5310D	1	06/10/2009 0032	PMM		12117
1		(TSS) SM 2540D	1	06/09/2009 1730	HBB		12044

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Alkalinity		SM 2320B	ND		10	3.9	mg/L	1
COD		SM 5220D	18		10	5.7	mg/L	1
Nitrate - N		353.2	0.52		0.020	0.0013	mg/L	1
Sulfate		300.0	11	B	1.0	0.13	mg/L	1
TDS		SM 2540C	62		10	3.4	mg/L	1
TOC		SM 5310D	3.4		1.0	0.063	mg/L	1
TSS		SM 2540D	ND		1.0	0.34	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-001
Description: P1-MW20 (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1045
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	06/05/2009 2359	DLB		11990

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	ND		0.50	0.027	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		0.50	0.17	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		0.50	0.019	ug/L	1
Toluene	108-88-3	8260B	ND		0.50	0.17	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		0.50	0.17	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		106	52-138
Bromofluorobenzene		94	70-147
Toluene-d8		107	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-001
Description: P1-MW20 (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1045
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/10/2009 0033	CDF	06/08/2009 1925	12054

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Iron	7439-89-6	6010B	ND		0.10	0.023	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-001
Description: P1-MW20 (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1045
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0443	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Iron	7439-89-6	6010B	0.034	J	0.10	0.023	mg/L	1
Manganese	7439-96-5	6010B	0.025		0.015	0.0049	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-002
Description: D-MW5R (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1650
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) SM 2320B	1	06/05/2009 1532	PMM		11868
1		(COD) SM 5220D	1	06/10/2009 0915	RLM	06/09/2009 1445	
1		(Nitrate - N) 353.2	1	06/05/2009 1035	WD		11924
1		(Sulfate) 300.0	1	06/16/2009 1616	DAS		12602
1		(TDS) SM 2540C	1	06/09/2009 2039	HBB		12122
1		(TOC) SM 5310D	1	06/10/2009 0215	PMM		12117
1		(TSS) SM 2540D	1	06/09/2009 1730	HBB		12044

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Alkalinity		SM 2320B	72		10	3.9	mg/L	1
COD		SM 5220D	170		10	5.7	mg/L	1
Nitrate - N		353.2	ND		0.020	0.0013	mg/L	1
Sulfate		300.0	0.14	BJ	1.0	0.13	mg/L	1
TDS		SM 2540C	160		10	3.4	mg/L	1
TOC		SM 5310D	47		1.0	0.063	mg/L	1
TSS		SM 2540D	1.2	J	2.0	0.34	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-002
Description: D-MW5R (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1650
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	50	06/06/2009 0311	DLB		11990

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	4100		25	1.4	ug/L	1
Ethylbenzene	100-41-4	8260B	660		25	8.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		25	0.94	ug/L	1
Toluene	108-88-3	8260B	110		25	8.5	ug/L	1
Xylenes (total)	1330-20-7	8260B	5100		25	8.5	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		108	52-138
Bromofluorobenzene		96	70-147
Toluene-d8		107	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-002
Description: D-MW5R (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1650
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/10/2009 0058	CDF	06/08/2009 1925	12054

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Iron	7439-89-6	6010B	0.40		0.10	0.023	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: ARCADIS U.S., Inc.
Laboratory ID: KF04042-002
Description: D-MW5R (060309)
Matrix: Aqueous
Date Sampled: 06/03/2009 1650
Date Received: 06/04/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0448	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Iron	7439-89-6	6010B	0.41		0.10	0.023	mg/L	1
Manganese	7439-96-5	6010B	0.016		0.015	0.0049	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

QC Summary

Inorganic non-metals - MB

Sample ID: KQ11868-001
Batch: 11868
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Alkalinity	ND		1	10	3.9	mg/L	06/05/2009 0934

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ11868-002
Batch: 11868
Analytical Method: SM 2320B

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Alkalinity	100	100		1	100	90-110	06/05/2009 0951

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ11868-003
Batch: 11868
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Alkalinity	100	100		1	101	0.54	90-110	20	06/05/2009 1008

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: KF04042-001MS
Batch: 11868
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Alkalinity	ND	100	96		1	96	70-130	06/05/2009 1437

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: KF04042-001MD
Batch: 11868
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Alkalinity	ND	100	98		1	98	2.0	70-130	20	06/05/2009 1520

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ11924-001
Batch: 11924
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Nitrate - N	ND		1	0.020	0.0013	mg/L	06/05/2009 1030

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ11924-002
Batch: 11924
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate - N	0.80	0.84		1	106	90-110	06/05/2009 1031

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ11924-003
Batch: 11924
Analytical Method: 353.2

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate - N	0.80	0.85		1	106	0.35	90-110	20	06/05/2009 1033

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12044-001
Batch: 12044
Analytical Method: SM 2540D
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TSS	ND		1	1.0	0.34	mg/L	06/09/2009 1730

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12044-002
Batch: 12044
Analytical Method: SM 2540D
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TSS	500	490		1	98	90-110	06/09/2009 1730

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12117-001
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TOC	ND		1	1.0	0.063	mg/L	06/09/2009 2147

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12117-002
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TOC	20	20		1	101	90-110	06/09/2009 2208

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12117-003
Batch: 12117
Analytical Method: SM 5310D

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
TOC	20	20		1	101	0.66	90-110	20	06/09/2009 2228

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: KF04042-001MS
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TOC	3.4	20	23		1	97	70-130	06/10/2009 0053

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: KF04042-001MD
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
TOC	3.4	20	23		1	97	0.42	70-130	20	06/10/2009 0114

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12122-001
Batch: 12122
Analytical Method: SM 2540C

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TDS	ND		1	10	3.4	mg/L	06/09/2009 2039

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12122-002
Batch: 12122
Analytical Method: SM 2540C

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TDS	1500	1500		1	102	90-110	06/09/2009 2039

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - Duplicate

Sample ID: KF04042-001DU
Batch: 12122
Analytical Method: SM 2540C
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Result (mg/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
TDS	62	62		1	5.0	20	06/09/2009 2039

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12602-001
Batch: 12602
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Sulfate	0.28	J	1	1.0	0.13	mg/L	06/16/2009 1447

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12602-002
Batch: 12602
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	20	21		1	103	90-110	06/16/2009 1509

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12602-003
Batch: 12602
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Sulfate	20	20		1	98	5.5	90-110	20	06/16/2009 1531

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: KQ11990-001
Batch: 11990
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Benzene	ND		1	0.50	0.027	ug/L	06/05/2009 2316
Ethylbenzene	ND		1	0.50	0.17	ug/L	06/05/2009 2316
Methyl tertiary butyl ether (MTBE)	ND		1	0.50	0.019	ug/L	06/05/2009 2316
Toluene	ND		1	0.50	0.17	ug/L	06/05/2009 2316
Xylenes (total)	ND		1	0.50	0.17	ug/L	06/05/2009 2316

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		94	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		108	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: KQ11990-002
Batch: 11990
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Benzene	50	49		1	97	70-130	06/05/2009 2150
Ethylbenzene	50	48		1	97	70-130	06/05/2009 2150
Methyl tertiary butyl ether (MTBE)	50	48		1	97	70-130	06/05/2009 2150
Toluene	50	48		1	96	70-130	06/05/2009 2150
Xylenes (total)	100	96		1	96	70-130	06/05/2009 2150

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		100	70-130
1,2-Dichloroethane-d4		101	70-130
Toluene-d8		106	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCSD

Sample ID: KQ11990-003
Batch: 11990
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Benzene	50	48		1	97	0.20	70-130	20	06/05/2009 2211
Ethylbenzene	50	47		1	94	3.1	70-130	20	06/05/2009 2211
Methyl tertiary butyl ether (MTBE)	50	48		1	97	0.19	70-130	20	06/05/2009 2211
Toluene	50	47		1	94	2.5	70-130	20	06/05/2009 2211
Xylenes (total)	100	94		1	94	1.8	70-130	20	06/05/2009 2211

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		100	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		108	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - MB

Sample ID: KQ12054-001
Batch: 12054
Analytical Method: 6010B
Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/08/2009 1925

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Iron	ND		1	0.10	0.023	mg/L	06/09/2009 2212

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCS

Sample ID: KQ12054-002
Batch: 12054
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/08/2009 1925

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Iron	20	20		1	101	80-120	06/09/2009 2217

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N - Recovery is out of criteria

+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCSD

Sample ID: KQ12054-003
Batch: 12054
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/08/2009 1925

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Dissolved Iron	20	20		1	101	0.28	80-120	20	06/09/2009 2222

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - MB

Sample ID: KQ12368-001
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Iron	ND		1	0.10	0.023	mg/L	06/16/2009 0402
Manganese	ND		1	0.015	0.0049	mg/L	06/16/2009 0402

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCS

Sample ID: KQ12368-002
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Iron	20	19		1	96	80-120	06/16/2009 0407
Manganese	2.0	1.9		1	93	80-120	06/16/2009 0407

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCSD

Sample ID: KQ12368-003
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Iron	20	20		1	98	2.5	80-120	20	06/16/2009 0413
Manganese	2.0	1.9		1	97	4.2	80-120	20	06/16/2009 0413

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

SHEALY ENVIRONMENTAL SERVICES, INC.

106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

SHEALY Chain of Custody Record

Number 102135

Client: ARCADIS	Report to Contact: Scott Bostian	Telephone No. / Fax No. / E-mail: 770-431-8666 / 770-435-2666	Quote No.: 11954
Address: 2849 Paces Ferry Rd	Sampler's Signature: x Erica Maddox	Waybill No.	Page 1 of 1
City: Atlanta / State: GA / Zip Code: 30339	Printed Name: Erica Maddox / Cecil Ka Bel	Analysis (Attach list if more space is needed.)	
Project Name: HAA-13 Pumphouse 1 Release 2			
Project No.: GP08HAFS, H13A, N1R2	P.O. No.		Lot No.: RF04042

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Soil	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	SAPS Kit	BTEX / MTBE	Dissolved Iron	Manganese / Iron	COD / TOC	TOC, TKN, Nitrate, Sulfate	Remarks / Cooler I.D.
P1 - MW20 (060309)	6/3/09	1045		x			2	1	1	3			✓	✓	✓	✓	✓	
D - MW5R (060309		1650		x			2	1	1	3			✓	✓	✓	✓	✓	
TB-01 (060309)	↓	1000		x						2			✓					

Erica Maddox

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished by: Erica Maddox	6/3/09	1930	1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date DUP 6/4/09	Time
3. Relinquished by: FEDEX	Date 6-4-09	Time 0932	3. Laboratory received by	Date 6/3/09 6/4/09	Time 9930
Comments			LAB USE ONLY Received on Ice (Circle) (Yes) No Ice Pack	6-4-09 Receipt Temp. 2.0 °C	

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 06-04-02

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 6

Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: Arcadis Cooler Inspected by/date: EZ 6.4.06 DMP Lot #: KF04042

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other

Yes ☑	No ☐	NA ☐	1. Were custody seals present on the cooler?
Yes ☑	No ☐	NA ☐	2. If custody seals were present, were they intact and unbroken?

Cooler ID/temperature upon receipt 2-6 °C / °C / °C / °C / °C / °C / °C / °C

Method: ☐ Temperature Blank ☑ Against Bottles
Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____. (For coolers received via commercial courier, PMs are to be notified immediately.
Yes ☑	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☐	No ☐	NA ☐	5. Were proper custody procedures (relinquished/received) followed?
Yes ☑	No ☐	NA ☐	6. Were sample IDs listed?
Yes ☑	No ☐	NA ☐	7. Was collection date & time listed?
Yes ☑	No ☐	NA ☐	8. Were tests to be performed listed on the COC or was quote # provided?
Yes ☑	No ☐	NA ☐	9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐	NA ☐	10. Did all container label information (ID, date, time) agree with COC?
Yes ☑	No ☐	NA ☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐	NA ☐	12. Was adequate sample volume available?
Yes ☑	No ☐	NA ☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑	NA ☐	14. Were any samples containers missing?
Yes ☐	No ☑	NA ☐	15. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	16. Were bubbles present >"pea-size" (¼" or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number) _____.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s) _____ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

ate 6-3-09 FedEx Tracking Number 865594008590

ender's ame ARCADIS INC Phone 770 431-8666

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐

SESI employee: _____

Comments: _____

Company ARCADIS

Address 3949 PACES FERRY RD SE STE 400

ity ATLANTA State GA ZIP 30339-3769

our Internal Billing Reference G P08WAES.H09A.KG0EX

Report of Analysis

ARCADIS U.S., Inc.
30 Patewood Drive
Suite 155
Greenville, SC 29615
Attention: Janet Christy

Project Name: HAA-13 Pumphouse 1 Release 2

Project Number: GP08HAFS.H13A.N1R2

Lot Number: KF05012

Date Completed: 06/17/2009

Nisreen Saikaly
Project Manager

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* K F 0 5 0 1 2 *

Case Narrative
ARCADIS U.S., Inc.
Lot Number: KF05012

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Nitrate - N

The MS/MSD recoveries in batch 11954 were outside acceptance criteria. All other QA/QC criteria for the batch were within acceptance criteria and method control limits. The MS/MSD recovery results are attributed to matrix interference. The associated sample results were reported and no corrective action was required.

Sample Summary
ARCADIS U.S., Inc.
Lot Number: KF05012

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	P1-MW1 (060409	Aqueous	06/04/2009 1530	06/05/2009
002	P1-MW6R (060409)	Aqueous	06/04/2009 1610	06/05/2009
003	P1-MW3 (060409)	Aqueous	06/04/2009 1655	06/05/2009
004	P1-MW19 (060409)	Aqueous	06/04/2009 1350	06/05/2009
005	P1-MW22 (060409)	Aqueous	06/04/2009 1150	06/05/2009
006	P1-MW23 (060409)	Aqueous	06/04/2009 1650	06/05/2009
007	TB-01 (060409)	Aqueous	06/05/2009 0930	06/05/2009
008	P1MW18 (060409)	Aqueous	06/05/2009	06/05/2009

(8 samples)

Executive Summary

ARCADIS U.S., Inc.

Lot Number: KF05012

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	P1-MW1 (060409	Aqueous	Ethylbenzene	8260B	1800		ug/L	5
001	P1-MW1 (060409	Aqueous	Toluene	8260B	650	B	ug/L	5
001	P1-MW1 (060409	Aqueous	Xylenes (total)	8260B	12000	B	ug/L	5
002	P1-MW6R (060409)	Aqueous	Benzene	8260B	100		ug/L	6
002	P1-MW6R (060409)	Aqueous	Ethylbenzene	8260B	510		ug/L	6
002	P1-MW6R (060409)	Aqueous	Toluene	8260B	44	B	ug/L	6
002	P1-MW6R (060409)	Aqueous	Xylenes (total)	8260B	3900	B	ug/L	6
003	P1-MW3 (060409)	Aqueous	Alkalinity	SM 2320B	30		mg/L	7
003	P1-MW3 (060409)	Aqueous	COD	SM 5220D	150		mg/L	7
003	P1-MW3 (060409)	Aqueous	Sulfate	300.0	0.17	J	mg/L	7
003	P1-MW3 (060409)	Aqueous	TDS	SM 2540C	70		mg/L	7
003	P1-MW3 (060409)	Aqueous	TOC	SM 5310D	37		mg/L	7
003	P1-MW3 (060409)	Aqueous	TSS	SM 2540D	6.0		mg/L	7
003	P1-MW3 (060409)	Aqueous	Benzene	8260B	92		ug/L	8
003	P1-MW3 (060409)	Aqueous	Ethylbenzene	8260B	1700		ug/L	8
003	P1-MW3 (060409)	Aqueous	Toluene	8260B	3100	B	ug/L	8
003	P1-MW3 (060409)	Aqueous	Xylenes (total)	8260B	8100	B	ug/L	8
003	P1-MW3 (060409)	Aqueous	Dissolved Iron	6010B	2.0		mg/L	9
003	P1-MW3 (060409)	Aqueous	Iron	6010B	2.0		mg/L	10
003	P1-MW3 (060409)	Aqueous	Manganese	6010B	0.10		mg/L	10
004	P1-MW19 (060409)	Aqueous	Benzene	8260B	730		ug/L	11
004	P1-MW19 (060409)	Aqueous	Ethylbenzene	8260B	1700		ug/L	11
004	P1-MW19 (060409)	Aqueous	Toluene	8260B	390	B	ug/L	11
004	P1-MW19 (060409)	Aqueous	Xylenes (total)	8260B	6600	B	ug/L	11
005	P1-MW22 (060409)	Aqueous	Benzene	8260B	26		ug/L	12
005	P1-MW22 (060409)	Aqueous	Ethylbenzene	8260B	190		ug/L	12
005	P1-MW22 (060409)	Aqueous	Toluene	8260B	72	B	ug/L	12
005	P1-MW22 (060409)	Aqueous	Xylenes (total)	8260B	4000	B	ug/L	12
006	P1-MW23 (060409)	Aqueous	Benzene	8260B	61		ug/L	13
006	P1-MW23 (060409)	Aqueous	Ethylbenzene	8260B	200		ug/L	13
006	P1-MW23 (060409)	Aqueous	Toluene	8260B	20	B	ug/L	13
006	P1-MW23 (060409)	Aqueous	Xylenes (total)	8260B	1500	B	ug/L	13

(32 detections)

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-001
Description: P1-MW1 (060409
Matrix: Aqueous
Date Sampled: 06/04/2009 1530
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	100	06/08/2009 2358	DLB		12076

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	ND		50	2.7	ug/L	1
Ethylbenzene	100-41-4	8260B	1800		50	17	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		50	1.9	ug/L	1
Toluene	108-88-3	8260B	650	B	50	17	ug/L	1
Xylenes (total)	1330-20-7	8260B	12000	B	50	17	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		88	52-138
Bromofluorobenzene		99	70-147
Toluene-d8		94	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-002
Description: P1-MW6R (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1610
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	50	06/09/2009 0019	DLB		12076

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	100		25	1.4	ug/L	1
Ethylbenzene	100-41-4	8260B	510		25	8.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		25	0.94	ug/L	1
Toluene	108-88-3	8260B	44	B	25	8.5	ug/L	1
Xylenes (total)	1330-20-7	8260B	3900	B	25	8.5	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		88	52-138
Bromofluorobenzene		95	70-147
Toluene-d8		91	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Inorganic non-metals

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-003
Description: P1-MW3 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1655
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Alkalinity) SM 2320B	1	06/10/2009 0123	PMM		12131
1		(COD) SM 5220D	1	06/10/2009 0915	RLM	06/09/2009 1445	
1		(Nitrate - N) 353.2	1	06/05/2009 1820	WD		11954
1		(Sulfate) 300.0	1	06/17/2009 1105	DAS		12644
1		(TDS) SM 2540C	1	06/10/2009 1909	HBB		12206
1		(TOC) SM 5310D	1	06/10/2009 0236	PMM		12117
1		(TSS) SM 2540D	1	06/10/2009 1455	HBB		12182

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Alkalinity		SM 2320B	30		10	3.9	mg/L	1
COD		SM 5220D	150		10	5.7	mg/L	1
Nitrate - N		353.2	ND		0.020	0.0013	mg/L	1
Sulfate		300.0	0.17	J	1.0	0.13	mg/L	1
TDS		SM 2540C	70		10	3.4	mg/L	1
TOC		SM 5310D	37		1.0	0.063	mg/L	1
TSS		SM 2540D	6.0		3.3	0.34	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-003
Description: P1-MW3 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1655
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	50	06/09/2009 0041	DLB		12076

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	92		25	1.4	ug/L	1
Ethylbenzene	100-41-4	8260B	1700		25	8.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		25	0.94	ug/L	1
Toluene	108-88-3	8260B	3100	B	25	8.5	ug/L	1
Xylenes (total)	1330-20-7	8260B	8100	B	25	8.5	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		91	52-138
Bromofluorobenzene		95	70-147
Toluene-d8		93	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-003
Description: P1-MW3 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1655
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0459	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Dissolved Iron	7439-89-6	6010B	2.0		0.10	0.023	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

ICP-AES

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-003
Description: P1-MW3 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1655
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6010B	1	06/16/2009 0459	CDF	06/12/2009 2200	12368

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Iron	7439-89-6	6010B	2.0		0.10	0.023	mg/L	1
Manganese	7439-96-5	6010B	0.10		0.015	0.0049	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-004
Description: P1-MW19 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1350
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	50	06/09/2009 0102	DLB		12076

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	730		25	1.4	ug/L	1
Ethylbenzene	100-41-4	8260B	1700		25	8.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		25	0.94	ug/L	1
Toluene	108-88-3	8260B	390	B	25	8.5	ug/L	1
Xylenes (total)	1330-20-7	8260B	6600	B	25	8.5	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		94	52-138
Bromofluorobenzene		100	70-147
Toluene-d8		97	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-005
Description: P1-MW22 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1150
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	50	06/09/2009 0124	DLB		12076

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	26		25	1.4	ug/L	1
Ethylbenzene	100-41-4	8260B	190		25	8.5	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		25	0.94	ug/L	1
Toluene	108-88-3	8260B	72	B	25	8.5	ug/L	1
Xylenes (total)	1330-20-7	8260B	4000	B	25	8.5	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		92	52-138
Bromofluorobenzene		96	70-147
Toluene-d8		93	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-006
Description: P1-MW23 (060409)
Matrix: Aqueous
Date Sampled: 06/04/2009 1650
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	10	06/09/2009 0146	DLB		12076

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	61		5.0	0.27	ug/L	1
Ethylbenzene	100-41-4	8260B	200		5.0	1.7	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		5.0	0.19	ug/L	1
Toluene	108-88-3	8260B	20	B	5.0	1.7	ug/L	1
Xylenes (total)	1330-20-7	8260B	1500	B	5.0	1.7	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		94	52-138
Bromofluorobenzene		98	70-147
Toluene-d8		95	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

Volatile Organic Compounds by GC/MS

Client: ARCADIS U.S., Inc.
Laboratory ID: KF05012-007
Description: TB-01 (060409)
Matrix: Aqueous
Date Sampled: 06/05/2009 0930
Date Received: 06/05/2009

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	06/09/2009 0320	DLB		12069

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Benzene	71-43-2	8260B	ND		0.50	0.027	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		0.50	0.17	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260B	ND		0.50	0.019	ug/L	1
Toluene	108-88-3	8260B	ND		0.50	0.17	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		0.50	0.17	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		108	52-138
Bromofluorobenzene		96	70-147
Toluene-d8		108	76-125

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"
N = Recovery is out of criteria
H = Out of holding time

QC Summary

Inorganic non-metals - MB

Sample ID: KQ11954-001
Batch: 11954
Analytical Method: 353.2

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Nitrate - N	ND		1	0.020	0.0013	mg/L	06/05/2009 1817

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ11954-002
Batch: 11954
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate - N	0.80	0.86		1	107	90-110	06/05/2009 1818

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ11954-003
Batch: 11954
Analytical Method: 353.2

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate - N	0.80	0.85		1	106	0.58	90-110	20	06/05/2009 1819

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: KF05012-003MS
Batch: 11954
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Nitrate - N	ND	0.80	0.55	N	1	68	90-110	06/05/2009 1821

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: KF05012-003MD
Batch: 11954
Analytical Method: 353.2
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Nitrate - N	ND	0.80	0.54	N	1	67	1.7	90-110	20	06/05/2009 1822

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12117-001
Batch: 12117
Analytical Method: SM 5310D
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TOC	ND		1	1.0	0.063	mg/L	06/09/2009 2147

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12117-002
Batch: 12117
Analytical Method: SM 5310D

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TOC	20	20		1	101	90-110	06/09/2009 2208

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12117-003
Batch: 12117
Analytical Method: SM 5310D

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
TOC	20	20		1	101	0.66	90-110	20	06/09/2009 2228

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12131-001
Batch: 12131
Analytical Method: SM 2320B

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Alkalinity	ND		1	10	3.9	mg/L	06/09/2009 2312

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12131-002
Batch: 12131
Analytical Method: SM 2320B

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Alkalinity	100	100		1	100	90-110	06/09/2009 2328

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12131-003
Batch: 12131
Analytical Method: SM 2320B

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Alkalinity	100	100		1	102	2.0	90-110	20	06/09/2009 2345

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: KF05012-003MS
Batch: 12131
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Alkalinity	30	100	130		1	96	70-130	06/10/2009 0206

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: KF05012-003MD
Batch: 12131
Analytical Method: SM 2320B
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Alkalinity	30	100	130		1	96	0.25	70-130	20	06/10/2009 0219

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12182-001
Batch: 12182
Analytical Method: SM 2540D
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TSS	ND		1	1.0	0.34	mg/L	06/10/2009 1455

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12182-002
Batch: 12182
Analytical Method: SM 2540D
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TSS	500	490		1	98	90-110	06/10/2009 1455

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12206-001
Batch: 12206
Analytical Method: SM 2540C

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TDS	ND		1	10	3.4	mg/L	06/10/2009 1909

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12206-002
Batch: 12206
Analytical Method: SM 2540C
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TDS	1500	1500		1	98	90-110	06/10/2009 1909

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - Duplicate

Sample ID: KF05012-003DU
Batch: 12206
Analytical Method: SM 2540C
Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Result (mg/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
TDS	70	70		1	17	20	06/10/2009 1909

PQL = Practical quantitation limit
P = The RPD between two GC columns exceeds 40%
N - Recovery is out of criteria
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
+ - RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: KQ12644-001
Batch: 12644
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Sulfate	ND		1	1.0	0.13	mg/L	06/17/2009 0850

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: KQ12644-002
Batch: 12644
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	20	19		1	95	90-110	06/17/2009 0913

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCSD

Sample ID: KQ12644-003
Batch: 12644
Analytical Method: 300.0
Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Sulfate	20	18		1	92	4.0	90-110	20	06/17/2009 0935

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: KQ12069-001
Batch: 12069
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Benzene	ND		1	0.50	0.027	ug/L	06/08/2009 2302
Ethylbenzene	ND		1	0.50	0.17	ug/L	06/08/2009 2302
Methyl tertiary butyl ether (MTBE)	ND		1	0.50	0.019	ug/L	06/08/2009 2302
Toluene	ND		1	0.50	0.17	ug/L	06/08/2009 2302
Xylenes (total)	ND		1	0.50	0.17	ug/L	06/08/2009 2302

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		95	70-130
1,2-Dichloroethane-d4		106	70-130
Toluene-d8		107	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: KQ12069-002
Batch: 12069
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Benzene	50	50		1	101	70-130	06/08/2009 2136
Ethylbenzene	50	50		1	99	70-130	06/08/2009 2136
Methyl tertiary butyl ether (MTBE)	50	50		1	99	70-130	06/08/2009 2136
Toluene	50	50		1	99	70-130	06/08/2009 2136
Xylenes (total)	100	99		1	99	70-130	06/08/2009 2136

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		98	70-130
1,2-Dichloroethane-d4		102	70-130
Toluene-d8		108	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCSD

Sample ID: KQ12069-003
Batch: 12069
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Benzene	50	51		1	102	1.4	70-130	20	06/08/2009 2158
Ethylbenzene	50	51		1	103	3.6	70-130	20	06/08/2009 2158
Methyl tertiary butyl ether (MTBE)	50	50		1	100	0.72	70-130	20	06/08/2009 2158
Toluene	50	50		1	100	0.55	70-130	20	06/08/2009 2158
Xylenes (total)	100	100		1	101	1.9	70-130	20	06/08/2009 2158

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		99	70-130
1,2-Dichloroethane-d4		104	70-130
Toluene-d8		107	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: KQ12076-001
Batch: 12076
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Benzene	ND		1	0.50	0.027	ug/L	06/08/2009 2336
Ethylbenzene	ND		1	0.50	0.17	ug/L	06/08/2009 2336
Methyl tertiary butyl ether (MTBE)	ND		1	0.50	0.019	ug/L	06/08/2009 2336
Toluene	0.35	J	1	0.50	0.17	ug/L	06/08/2009 2336
Xylenes (total)	0.44	J	1	0.50	0.17	ug/L	06/08/2009 2336

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		94	70-130
1,2-Dichloroethane-d4		85	70-130
Toluene-d8		93	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: KQ12076-002
Batch: 12076
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Benzene	50	51		1	103	70-130	06/08/2009 2210
Ethylbenzene	50	53		1	105	70-130	06/08/2009 2210
Methyl tertiary butyl ether (MTBE)	50	56		1	112	70-130	06/08/2009 2210
Toluene	50	53		1	106	70-130	06/08/2009 2210
Xylenes (total)	100	110		1	107	70-130	06/08/2009 2210

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		96	70-130
1,2-Dichloroethane-d4		80	70-130
Toluene-d8		93	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCSD

Sample ID: KQ12076-003
Batch: 12076
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Benzene	50	50		1	100	2.6	70-130	20	06/08/2009 2231
Ethylbenzene	50	51		1	102	3.8	70-130	20	06/08/2009 2231
Methyl tertiary butyl ether (MTBE)	50	54		1	108	3.1	70-130	20	06/08/2009 2231
Toluene	50	52		1	104	2.0	70-130	20	06/08/2009 2231
Xylenes (total)	100	100		1	102	4.2	70-130	20	06/08/2009 2231

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		96	70-130
1,2-Dichloroethane-d4		81	70-130
Toluene-d8		96	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - MB

Sample ID: KQ12368-001
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Iron	ND		1	0.10	0.023	mg/L	06/16/2009 0402
Manganese	ND		1	0.015	0.0049	mg/L	06/16/2009 0402

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCS

Sample ID: KQ12368-002
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Iron	20	19		1	96	80-120	06/16/2009 0407
Manganese	2.0	1.9		1	93	80-120	06/16/2009 0407

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCSD

Sample ID: KQ12368-003
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Iron	20	20		1	98	2.5	80-120	20	06/16/2009 0413
Manganese	2.0	1.9		1	97	4.2	80-120	20	06/16/2009 0413

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - MB

Sample ID: KQ12368-001
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Dissolved Iron	ND		1	0.10	0.023	mg/L	06/16/2009 0402

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCS

Sample ID: KQ12368-002
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Dissolved Iron	20	19		1	96	80-120	06/16/2009 0407

PQL = Practical quantitation limit

ND = Not detected at or above the MDL

P = The RPD between two GC columns exceeds 40%

J = Estimated result < PQL and ≥ MDL

N - Recovery is out of criteria

+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-AES - LCSD

Sample ID: KQ12368-003
Batch: 12368
Analytical Method: 6010B

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 06/12/2009 2200

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Dissolved Iron	20	20		1	98	2.5	80-120	20	06/16/2009 0413

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N - Recovery is out of criteria
+ - RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

SHEALY Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 102280

Client: Arcadis	Report to Contact:
Address: 2849 Paces Ferry Rd Ste 400	Sampler's Signature: x Cecil J Bell
City: Atlanta / State: GA / Zip Code: 30339	Printed Name: Cecilia Bell
Project Name: HAA-13 Pumphouse 1 Release 2	Telephone No. / Fax No. / E-mail: 770-431-8600 / 770-435-2606
Project No.: GP08HAFS.H13A.NIR2	Waybill No.:
P.O. No.:	Quote No.:
	Page 1 of 1

Analysis (Attach list if more space is needed.)

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Soil	Non-Aqueous	No. of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	ZnOAc/NaOH	BTEX/MTBE	Dissolved Iron	Manganese/Iron	COD/TOC	TDS, TSS, Alk, Nitrate, Sulfate
P1-MW1 (060409)	6/4/09	1530	G	X									✓				
P1-MW16R (060409)	6/4/09	1610		X									✓				
P1-MW3 (060409)	6/4/09	1655		X				2	1	1	3		✓	✓	✓	✓	✓
P1-MW19 (060409)	6/4/09	1350		X									✓				
P1-MW22 (060409)	6/4/09	1150		X									✓				
~~P1-MW23 (060309)~~	6/3/09			X									✓				
TB-01 (060109)	6/4/09																

Lot No.: KF05012
Remarks / Cooler I.D.

CJBell

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☐ Standard ☐ Rush (Specify)

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by			1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by: FEDEX	Date: 060509	Time: 0930	3. Laboratory received by: Sabrina Boles	Date: 060509	Time: 0930

Comments:

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack

Receipt Temp. 5.0 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 6

Page 1 of 1
Replaces Date: 09/22/06
Effective Date: 05/29/07

Sample Receipt Checklist (SRC)

Client: Arcadis   Cooler Inspected by/date: 06/05/09   Lot #: KF05012

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other

Yes	No	NA	Question
☑	☐	☐	1. Were custody seals present on the cooler?
☑	☐	☐	2. If custody seals were present, were they intact and unbroken?

Cooler ID/temperature upon receipt 5.0/ °C / °C / °C / °C
/ °C / °C / °C / °C

Method: ☐ Temperature Blank ☑ Against Bottles
Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes	No	NA	Question
☐	☐	☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: ______. (For coolers received via commercial courier, PMs are to be notified immediately.
☐	☐	☐	4. Is the commercial courier's packing slip attached to this form?
☑	☐	☐	5. Were proper custody procedures (relinquished/received) followed?
☑	☐	☐	6. Were sample IDs listed?
☑	☐	☐	7. Was collection date & time listed?
☑	☐	☐	8. Were tests to be performed listed on the COC or was quote # provided?
☑	☐	☐	9. Did all samples arrive in the proper containers for each test?
☑	☐	☐	10. Did all container label information (ID, date, time) agree with COC?
☑	☐	☐	11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
☑	☐	☐	12. Was adequate sample volume available?
☑	☐	☐	13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐	☑	☐	14. Were any samples containers missing?
☑	☐	☐	15. Were there any excess samples not listed on COC?
☒ (crossed out; "written in error")	☑	☐	16. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
☑	☐	☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
☐	☐	☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
☐	☐	☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) and toxicity (<0.1mg/L) samples free of residual chlorine?
☑	☐	☒ (RBM 6/5/09)	20. Were collection temperatures documented on the COC for NC samples?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) ______ were received incorrectly preserved and were adjusted accordingly in sample receiving with ______ (H_2SO_4,HNO_3,HCl,NaOH) with the SR # (number)

Sample(s) ______ were received with bubbles >6 mm in diameter.

Sample(s) ______ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.

Toxicity sample(s) ______ were received with TRC >0.1 mg/L and were analyzed by method 330.5.

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐   Did client respond: Yes ☐ No ☐
SESI employee: ______   Date of response: ______

Comments: PT-MW18 was received but not requested on the COC.
~~Pre~~ Per Client's request, analysis not performed. RBM 6/5/09
RBM

Client Name: Arcadis
Contact: Scott Bostian
Address: 2849 Paces Ferry Rd.
Atlanta, GA 30339

Lab Proj #: P0906114
Report Date: 06/18/09
Client Proj Name: Hunter Stewart
Client Proj #: GP08HAFS.H13A.NA1R2

Laboratory Results

Total pages in data package: 8

Lab Sample #	Client Sample ID
P0906114-01	D-MW37(060809)
P0906114-02	D-MW11(060809)

Microseeps test results meet all the requirements of the NELAC standards or provide reasons and/or justification if they do not.

Approved By: Debbie Hallo ***Date:*** 6-18-09

Project Manager: Debbie Hallo

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email customerservice@microseeps.com.

Case Narrative:

Client Name: Arcadis
Contact: Scott Bostian
Address: 2849 Paces Ferry Rd.
Atlanta, GA 30339

Lab Proj #: P0906114
Report Date: 06/18/09
Client Proj Name: Hunter Stewart
Client Proj #: GP08HAFS.H13A.NA1R2

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
D-MW37(060809)	Water	P0906114-01	08 Jun. 09 13:50	09 Jun. 09 10:55

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Methane		2900.000	0.100	ug/L	AM20GAX	6/17/09	rw

Data Qualifiers. J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Arcadis
Contact: Scott Bostian
Address: 2849 Paces Ferry Rd
Atlanta, GA 30339

Lab Proj #: P0906114
Report Date: 06/18/09
Client Proj Name: Hunter Stewart
Client Proj #: GP08HAFS.H13A.NA1R2

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
D-MW11(060809)	Water	P0906114-02	08 Jun. 09 13:45	09 Jun. 09 10:55

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Methane		920.000	0.100	ug/L	AM20GAX	6/17/09	rw

Client Name: Arcadis
Contact: Scott Bostian
Address: 2849 Paces Ferry Rd.
Atlanta, GA 30339

Lab Proj #: P0906114
Report Date: 06/18/09
Client Proj Name: Hunter Stewart
Client Proj #: GP08HAFS.H13A.NA1R2

Prep Method: In House Dissolved Gas Sample Preparation
Analysis Method: Light Hydrocarbons (C1-C4) in Water

M090618026-MB

	Result		TrueSpikeConc.	RDL	%Recovery	Ctl Limits
Methane	< 0.100	ug/L		0.100		- NA

M090618026-LCS

	Result		TrueSpikeConc.	%Recovery	Ctl Limits
Methane	880.000	ug/L	825.00	107.00	75 - 125

M090618026-LCSD

	Result		TrueSpikeConc.	%Recovery	Ctl Limits	RPD	RPD Ctl Limits
Methane	880.000	ug/L	825.00	107.00	75 - 125	0.00	0 - 20

Outlined Results indicate results outside of Control limits

Data Qualifiers. J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

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Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page ____ of ____

Project Number/Name GROSHAFFS. HISA NAAR2

Project Location Hunter Stewart

Laboratory Microseeps

Project Manager Scott Bastian

Sampler(s)/Affiliation Erica Maddox

Sample ID/Location	Matrix	Date/Time Sampled	Lab ID	ANALYSIS / METHOD / SIZE: Methane						Remarks	Total
D-MW37(060809)	GW	6/8/09 1350		✓							
D-MW11(060809)	"	" 1345		✓							
TB-01(060809)	↓	↓ 1200		✓							
										Total No. of Bottles/ Containers	

Sample Matrix: L = Liquid; S = Solid; A = Air

Relinquished by: Erica Maddox	Organization: ARCADIS	Date 6/8/09	Time 1500	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time	Yes	No N/A
Relinquished by: _____	Organization: _____	Date / /	Time	Seal Intact?	
Received by: _____	Organization: _____	Date / /	Time	Yes	No N/A

Special Instructions/Remarks: _____

Delivery Method: ☐ In Person ☐ Common Carrier _____ SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-12/01

NON-CONFORMANCE FORM

Microseeps Project Number: F090626114

Date: 6/9/9 Time of Receipt: _____ Receiver: [signature]

Client: AGM

REASON FOR NON-CONFORMANCE:

no TB Rec

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

6/10 - Per attached email TB-01 is the trip blank ~~[illegible]~~ were included in cooler

- broken glass in cooler, trip blank thrown away w/ broken glass. advised client

Customer Service Initials: _____ Date: _____

Heather Hauser

From: Bostian, Scott [Scott.Bostian@arcadis-us.com]
Sent: Wednesday, June 10, 2009 8:24 AM
To: Heather Hauser
Subject: RE: Hunter Stewart Samples

Heather,

The TB-01 listed is the trip blank that was included in the cooler. The trip blank is not labeled TB-01.

Let me know if you have any additional questions.

Thanks,
Scott

ARCADIS
Scott Bostian, PE
Senior Engineer

801 Corporate Center Drive, Suite 300
Raleigh, NC 27607
Tel 919.854.1282
Fax 919.854.5448
Mobile 919.417.2643
scott.bostian@arcadis-us.com
www.arcadis-us.com

ARCADIS, Imagine the result

From: Heather Hauser [mailto:HHauser@microseeps.com]
Sent: Tuesday, June 09, 2009 3:03 PM
To: Bostian, Scott
Subject: Hunter Stewart Samples

Scott,

We did not received sample TB-01(060809) listed on your coc. Would you like me to delete this from your chain?

Heather Hauser
Microseeps, Inc.
220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245
412-826-3433 fax

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Appendix D

Soil Oxidant Demand Test Report

ARCADIS

4915 Prospectus Drive
Suite F
Durham
North Carolina 27713
Tel 919.544.4535
Fax 919.544.5690

ARCADIS G&M of North Carolina, Inc.

NC Engineering License # C-1869
NC Surveying License # C-1869

MEMO

To:
Scott Bostian
Jeff Burdick

Copies:
Project Folder
Dave Liles

From:
Renee Clayton

Date:
June 30, 2009

ARCADIS Project No.:
GP08HASF.H13A.NA1R2

Subject:
Hunter Army Airfield Soil Oxidant Demand Study

Introduction

The purpose of this memo is to present the results of a soil oxidant demand (SOD) test conducted by the ARCADIS Treatability Laboratory for the Hunter Army Airfield site.

On June 5, 2009, the ARCADIS Treatability Laboratory received two soil samples (SOD-2(060409) and SOD-3(0604009)) with associated groundwater samples. All samples were received in good condition and were stored at 4°C until further processing occurred.

SOD Test

For each soil sample, a 40 gram (g) homogenized soil sample (as received moisture content) was mixed with 200 milliliters (mL) of site groundwater in an HDPE bottle. Sodium persulfate was dosed to 20 grams persulfate/Liter groundwater. The treatments were stored on the laboratory bench top and shaken once per day during the 7 day treatability study interval.

Supernatant aliquots for sodium persulfate analysis were removed after 1 day, 3 days and 7 days had elapsed and analyzed for sodium persulfate concentration by iodiometric titration.

Results

The results of SOD analyses for sodium persulfate are summarized in Table 1. The SOD results indicate a moderate demand for persulfate, with sample SOD-2 consuming 14.08 grams oxidant/Kg soil by day 7 and sample SOD-3 consuming 24.99 grams oxidant/Kg soil by day 7. Table 1 also provides an SOD value for the groundwater samples that were collected. Both groundwater samples exhibited a significant oxidant demand. Sample SOD-2 consumed 3.77 grams oxidant/Liter of groundwater and SOD-3 consumed 4.17 grams oxidant/Liter groundwater.

As with any chosen oxidant, the use of sodium persulfate should not be seen as a one-time application at field scale. Rather, multiple oxidant applications with temporal separation are typically found to be a much more effective *In situ* chemical oxidation (ISCO) strategy.

Table 1. Summary of Sodium Persulfate Demand for Hunter Army Airfield Site Samples

Sample ID	Day	Oxidant Demand (g Oxidant/kg Soil)
SOD-2	Day 1	9.72
	Day 3	9.72
	Day 7	**14.08**
SOD-3	Day 1	9.72
	Day 3	14.08
	Day 7	**24.99**
SOD-2 water only	**Day 7**	**3.77 (g Oxidant/ L water)**
SOD-3 water only	**Day 7**	**4.17(g Oxidant/L water)**

Conclusions

Using the measured SOD values in Table 1 as a reference, it is possible that implementation of sodium persulfate ISCO will prove to be an economically viable option for remediating the trace benzene within the Hunter Army Airfield site.

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Appendix E

Sodium Persulfate Dosing Calculations

Sodium Persulfate Initial Injection Dosage Calculations
Hunter AAF PH1 R2

CSB 8/31/09

Soil oxidant demand	20	g sodium persulfate / kg soil	average of results from SOD lab test
Soil bulk density	110	lb/ft3	
Mobile porosity	0.15		
Injection radius	10	ft	
Injection screen length	15	ft	
Volume of soil in injection zone	4,712	ft3	
Mass of soil in injection zone	235,619	kg	
Mass of persulfate required per injection	1,151	kg	assume 3 injection events; using only 25% of the SOD in each injection
Mass of persulfate required per injection	2,532	lb	assume 3 injection events; using only 25% of the SOD in each injection
Injection volume	20,039	L	
Sodium persulfate dosing concentration	57	g sodium persulfate /L	
Sodium persulfate dosing concentration	6%	sodium persulfate by weight	

Notes:
1. Shaded cells denote calculated values.

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Appendix F

Calcium Peroxide Dosing Calculations

Calcium Peroxide Initial Injection Dosing Calculations CSB 8/31/09
Hunter AAF PH1 R2

Parameter	Value	Unit	Note / Reference
Injection zone thickness	10	ft	
Length of injection barrier	100	ft	10 wells with 10-foot spacing
Width of injection barrier	20	ft	2 rows of injection wells with 10-foot spacing between rows
Soil bulk density	110	lb/ft3	
Total porosity	0.30		
Mobile porosity	0.15		
Injection radius (ROI)	5	ft	
Number of injection point	21		
Background chemical oxygen demand (COD) in water	104	mg/L	average value of baseline sampling event data
Natural organic matter in soil	200	mg/kg	assumed valve
Groundwater seepage velocity	0.33	ft/day	
Concentration of BTEX through the barrier	9,420	ug/L	total BTEX concentration in P1-MW19 (just downgradient of the barrier) in June 2009
Longevity of calcium peroxide	180	days	
Oxygen utilization factor for BTEX	3	g O2/g BTEX	from Wiedemeier et. al., 1999[2]
Oxygen content of CaO2 product	17%	by weight	from Solvay (vendor of calcium peroxide)
Safety factor for CaO2 dosing	1.5		

Treatment zone volume	20,000	ft3	
Mass of soil in treatment zone	1,000,000	kg	=treatment zone volume* soil bulk density
Volumetric flow of groudwater through treatement zone	50	ft3/day	=seepage velocity* length*thickness of treatment zone*mobile porosity
BTEX mass through barrier per day	0.01	kg/day	=BTEX concentration* volumetric flow of groundwater
BTEX mass through barrier between injection events	2	kg	=BTEX mass through barrier per day* longevity of CaO2
Oxygen mass required for BTEX degradation	8	kg	=BTEX mass* oxygen utilization factor for BTEX
Oxygen mass required for background COD in water	27	kg	=COD concentration in water* volumetric flow of groundwater*longevity of CaO2
Oxygen mass required for background COD in soil	200	kg	=COD concentration in soil* mass of soil in treatment zone
Total oxygen required	234	kg	=sum of all oxygen demand
Mass of CaO2 product required	1,353	kg	=total oxygen demand / oxygen content of CaO2 product
Total injection volume	2,474	ft3	=PI*(ROI)^2*screen length*mobile porosity*number of injection well
CaO2 dosing concentration	29	g/L	=mass of CaO2 product required / injection volume *safety factor
CaO2 dosing concentration	2.9%	calcium peroxide product by weight	

Notes:
1. Shaded cells denote calculated values.
2. Wiedemeier, T.H., Rifai, H.S., Wilson, J.T., and Newell, C., 1999. Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface, John Wiley and Sons.

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Appendix G

Site Ranking Form

SITE RANKING FORM

Facility Name: Former Pumphouse #1 Site (Release #2) Ranked by: Maddox/Bostian

Facility ID: 9-025085*2 County: Chatham Date Ranked: 8/07/09

SOIL CONTAMINATION

A. Total Regulated PAHs – Maximum concentration at the site (Assume < 0.660 mg/kg if only gasoline was stored on site)

_____ ≤ 0.0660 = 0
_____ .066-0.99 mg/kg = 10
*X 1-10 mg/kg = 25
_____ >10 mg/kg = 50
*1996 CAP-Part A sample SB0801 at 4.0'-6.0'

B. Total Benzene – Maximum Concentration found on the site

_____ ≤ 0.005 mg/kg = 0
_____ >0.005 - .05 mg/kg = 1
*X .05 – .99 = 10
_____ 1 – 9.9 = 25
_____ 10 – 49.9 mg/kg = 40
_____ ≥ 50 mg/kg = 50
*2008 Supplemental Investigation sample P1-DB-06

C. DEPTH TO GROUNDWATER – (Shallowest)
(bls = below land surface)

_____ > 50' bls = 1
_____ > 25' bls = 2
_____ > 10' bls = 5
X ≤ 10' bls = 10

Fill in the blanks: (A. 25) + (B. 10) = (35) x C. (10) = D. (350)

GROUNDWATER CONTAMINATION

E. Free Product (Nonaqueous-phase liquid hydrocarbons:
See Guidelines for definition of "sheen").

_____ No free product = 0
*X Sheen – 1/8" = 250
_____ > 1/8" - 6" = 500
_____ > 6" – 1ft. = 1,000
_____ For every additional inch above a foot, add 100 more points = 1,000+
*July 2008 Gauging event

F. Dissolved Benzene – Maximum Concentration at the site (One well must be located at the source of the release.)

_____ ≤ ug/L = 0
_____ >5 – 100 ug/L = 5
_____ >100 – 1,000 ug/L = 50
* X >1,000 – 5,000 ug/L = 250
_____ >5,000 – 10,000 ug/L = 500
_____ > 10,000 ug/L = 1,500
*Sample from D-MW5R (June 2009)

Fill in the blanks: (E. 250) + (F. 250) = G. (500)

Facility Name: Former Pumphouse #1 Site (Release #2) Ranked by: Maddox/Bostian

Facility ID: 9-025085*2 County: Chatham Date Ranked: 7/26/09

POTENTIAL RECEPTORS (Must be Field Verified)

Distance from nearest contaminant plume boundary to the nearest hydraulically connected Point of Withdrawal for water supply. This distance must be field-verified. **If the point of withdrawal is not hydraulically connected, evidence as outlined in the CAP-A guidance document MUST be presented to substantiate this claim.**

H. Public		I. Non-Public	
_____	Impacted = 2,000	_____	Impacted = 1,000
_____	≤ 500' = 500	_____	≤ 100' = 500
_____	> 500' – 1/4 mi = 25	_____	> 100' - 500' = 25
_____	> 1/4 mi – 1 mi = 10	_____	> 500' – 1/4 mi = 5
_____	> 1 mi – 2 mi = 2	_____	> 1/4 mi – 1/2 mi = 2
*X	> 2 mi = 0	X	> 1/2 mi = 0
For lower susceptibility areas only:		For lower susceptibility areas only:	
_____	> 1 mi = 0	_____	> 1/4 mi = 0

Note: If site is in lower susceptibility area do not use the shaded areas.

J. Distance from nearest contaminant plum boundary to downgradient Surface Waters **OR UTILITY TRENCHES & VAULTS** (Must be field verified)		K. Distance from any Free Product to basements and crawl spaces	
X	Impacted = 500	_____	Impacted = 500
_____	≤ 500' = 50	_____	≤ 500' = 50
_____	> 500'- 1,000' = 5	_____	> 500'- 1,000' = 5
_____	> 1,000' = 2	X	> 1,000' = 2

Fill in the blanks:

(H. 0) + (I. 0) + (J. 500) + (K. 2) = L. 502 (G. 500) x (L. 502) = M. 251,000 (M. 251,000) + (D. 350) = N. 251,350

P. SUSCEPTIBILITY AREA MULTIPLIER

_____	If site is located in a Low Ground – Water Pollution Susceptibility Area = 0.5
X	All other sites = 1

Q. EXPLOSION HAZARD

Have any explosive petroleum vapors, possibly originating from this release, been detected in any subsurface structure (e.g., utility trenches, basements, vaults, crawl space, etc.)

_____	Yes = 200,000
X	No = 0

(N. 251,350) x (P. 1) + (Q. 0) = ***251,350** ENVIRONMENTAL SENSITIVITY SCORE

*Based on 2009 groundwater concentration in D-MW5R and July 2008 free product thickness