UNITED STATES AIR FORCE
JOINT BASE ELMENDORF-RICHARDSON
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ENVIRONMENTAL RESTORATION PROGRAM

FALL 2010
GROUNDWATER MONITORING REPORT

JBER-RICHARDSON OPERABLE UNIT E ARMORED VEHICLE MAINTENANCE AREA

FINAL

JANUARY 2012

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ARMORED VEHICLE MAINTENANCE AREA

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

Prepared for:
673rd Civil Engineer Squadron, Asset Management Flight,
Natural Resources Element, Restoration Section

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Under Contract to U.S. Army Corps of Engineers
Contract No. W911KB-08-D-0005, Task Order 013

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Abbreviations

AAC	*Alaska Administrative Code*
ADEC	Alaska Department of Environmental Conservation
ARAR	applicable or relevant and appropriate requirement
AVMA	Armored Vehicle Maintenance Area
ºC	degrees Celsius
CFR	*Code of Federal Regulations*
COC	chemical of concern
CRREL	Cold Regions Research and Engineering Laboratory
DCE	dichloroethene
DPW	U.S. Army Directorate of Public Works
EPA	U.S. Environmental Protection Agency
J	estimated quantity
JBER	Joint Base Elmendorf-Richardson
MCL	maximum contaminant level
mg/L	milligrams per liter
M-K	Mann-Kendall
MS	matrix spike
MSD	matrix spike duplicate
MSL	mean sea level
µg/L	micrograms per liter
OUE	Operable Unit E
PCE	tetrachloroethene
POL	petroleum, oil, and lubricant
RI	remedial investigation
ROD	Record of Decision
TCE	trichloroethene
USACE	U.S. Army Corps of Engineers
VC	vinyl chloride
VOC	volatile organic compound

Executive Summary

This report presents the results of the November 2010 groundwater monitoring event conducted at the Armored Vehicle Maintenance Area (AVMA) of Operable Unit E (OUE), Joint Base Elmendorf-Richardson (JBER)-Richardson (Formerly Fort Richardson), Alaska, and a brief summary of historical data trends. The November 2010 monitoring tasks were completed by Shannon & Wilson, Inc. for the U.S. Army Directorate of Public Works (DPW) under contract to the U.S. Army Corps of Engineers (USACE) in accordance with the scope of work for Contract W911KB-08-D-0005, Task Order 0013.

Ten wells were sampled during the November 2010 sampling event at the AVMA, including six wells within the extent of contamination, three downgradient wells, and one cross-gradient background well. Samples were analyzed for volatile organic compounds (VOCs), aluminum, arsenic, and several natural attenuation parameters including iron, manganese, sulfate, methane, and total nitrate/nitrite.

Based on historical and current data, through the 2010 monitoring event, the following conclusions can be made:

- Tetrachloroethene (PCE) is the chemical of concern (COC) at the AVMA and was detected in each of the six wells within the known extent of contamination at concentrations above the maximum contaminant level (MCL) documented in the OUE Record of Decision (ROD). No other trends are apparent from the historical monitoring data except for the statistically increasing PCE concentration trend interpreted at well AP-4342.
- The results of biodegradation parameters and the absence of PCE breakdown products continue to suggest that biodegradation of PCE may be limited at the AVMA and that the primary mechanism of natural attenuation at the site continues to be dilution. Monitoring of natural attenuation parameters is required by the ROD. However, for sites where biodegradation is not playing a key role in the attenuation process, monitoring and evaluation of biodegradation parameters provide little value toward the understanding of the site contaminant conditions.

SECTION 1

Introduction

1.1 Project Overview

This report presents the results of the November 2010 groundwater monitoring event conducted at the Armored Vehicle Maintenance Area (AVMA) of Operable Unit E (OUE), Joint Base Elmendorf-Richardson (JBER)-Richardson (Formerly Fort Richardson), Alaska (Figure 1-1) and a brief summary of historical data. The purpose of this report is to present the results of groundwater monitoring at the AVMA, completed under the JBER-Richardson Groundwater Monitoring Program. The Groundwater Monitoring Program is part of the selected remedy required by the OUE Record of Decision (ROD), which was signed in September 2005. These 2010 monitoring tasks were completed by Shannon & Wilson, Inc. (Shannon & Wilson) for the U.S. Army Directorate of Public Works (DPW) under contract to the U.S. Army Corps of Engineers (USACE) in accordance with the scope of work for Contract W911KB-08-D-0005, Task Order 0013.

This report contains historical data collected at OUE since 2002 for wells included in the 2010 monitoring event and describes the sampling effort conducted by Shannon & Wilson in November 2010. Although some groundwater sampling occurred before 2002, the data were not readily available for inclusion in this report. Older data are included in the JBER-Richardson Administrative Record and are available from the information repositories at the UAA/APU Consortium Library and the DPW Environmental Resource Department on JBER-Richardson. The data presented are compared to cleanup level goals established by the ROD.

1.2 Site Location and Description

JBER-Richardson occupies approximately 61,500 acres of land slightly northeast of Anchorage, Alaska (Figure 1-1). This report focuses on the AVMA of OUE, which is located in the western region of the cantonment area of JBER-Richardson where an area with soil and groundwater affected by tetrachloroethene (PCE) exists (Figures 1-2 and 1-3). The AVMA was originally identified as a potential source area from historical aerial photographs, which indicated areas of buried debris, drainage ditches near the former vehicle wash area, and other identified ditches; however, data collected during the 2002 remedial investigation (RI) (CH2M HILL, 2004) indicated that these areas were not the source area for the contaminated groundwater in the vicinity of the site. A single main source of groundwater contamination has not been identified. Data collected during the OUE RI strongly suggests that PCE contamination in groundwater at the AVMA likely resulted from vehicle maintenance and laundry operations conducted at Buildings 732 and 726, respectively. Historical data show that PCE was used at the laundry facility and low levels of PCE were detected in soils at the Building 726 site during the Operable Unit E remedial investigation (RI) (ENSR, 1998).

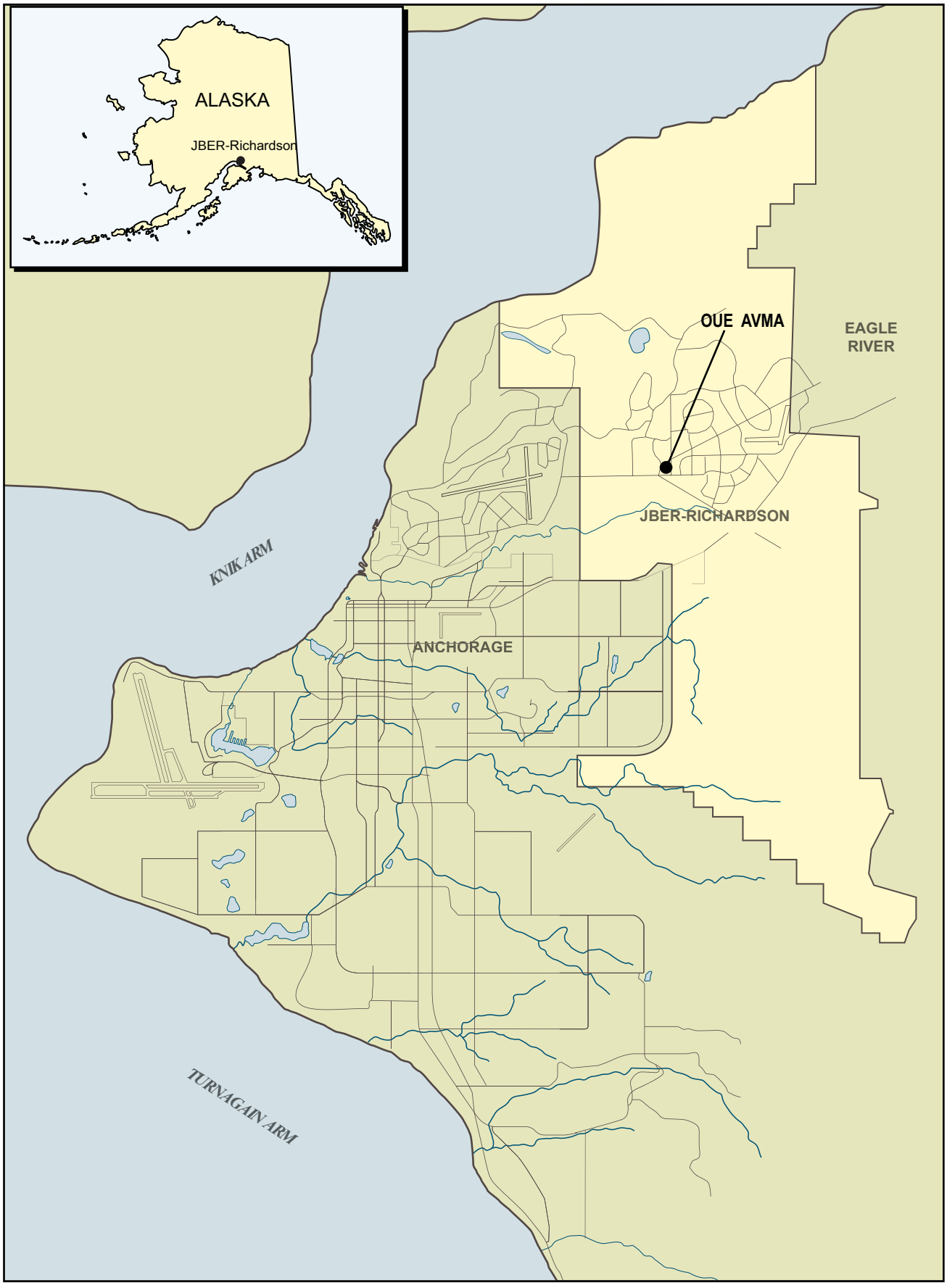
1.3 Geology and Hydrogeology

JBER-Richardson is located within the Cook Inlet-Susitna Lowland Section of the Coastal Trough physiographic province of Alaska. The majority of JBER-Richardson lies less than 500 feet above mean sea level (MSL), with local relief varying between 50 feet MSL and 250 feet MSL. The geology of JBER-Richardson is primarily the result of past glacial events and consists of the Elmendorf moraine, alluvial fans, and glacial outwash deposits. The hydrogeology of JBER-Richardson, although extremely variable across the installation, is composed of three primary aquifer systems–a shallow perched (unconfined) system, a locally semi-confined system, and a deeper confined system. The upper confining unit tapers out near the Davis Highway where the shallow perched and locally semi-confined aquifers merge (Figure 1-3). Shallow perched groundwater of limited volume and extent exists in localized areas beneath the AVMA site.

The 10 wells monitored during the 2010 event are screened within either the shallow perched system or downgradient of the confluence of the perched and locally semi-confined systems, where the locally semi-confined system becomes unconfined.

1.4 Previous Site Investigations and Site History

Since the 1950s, many investigations and activities have been conducted at the OUE AVMA. These events are summarized in Table 1-1.

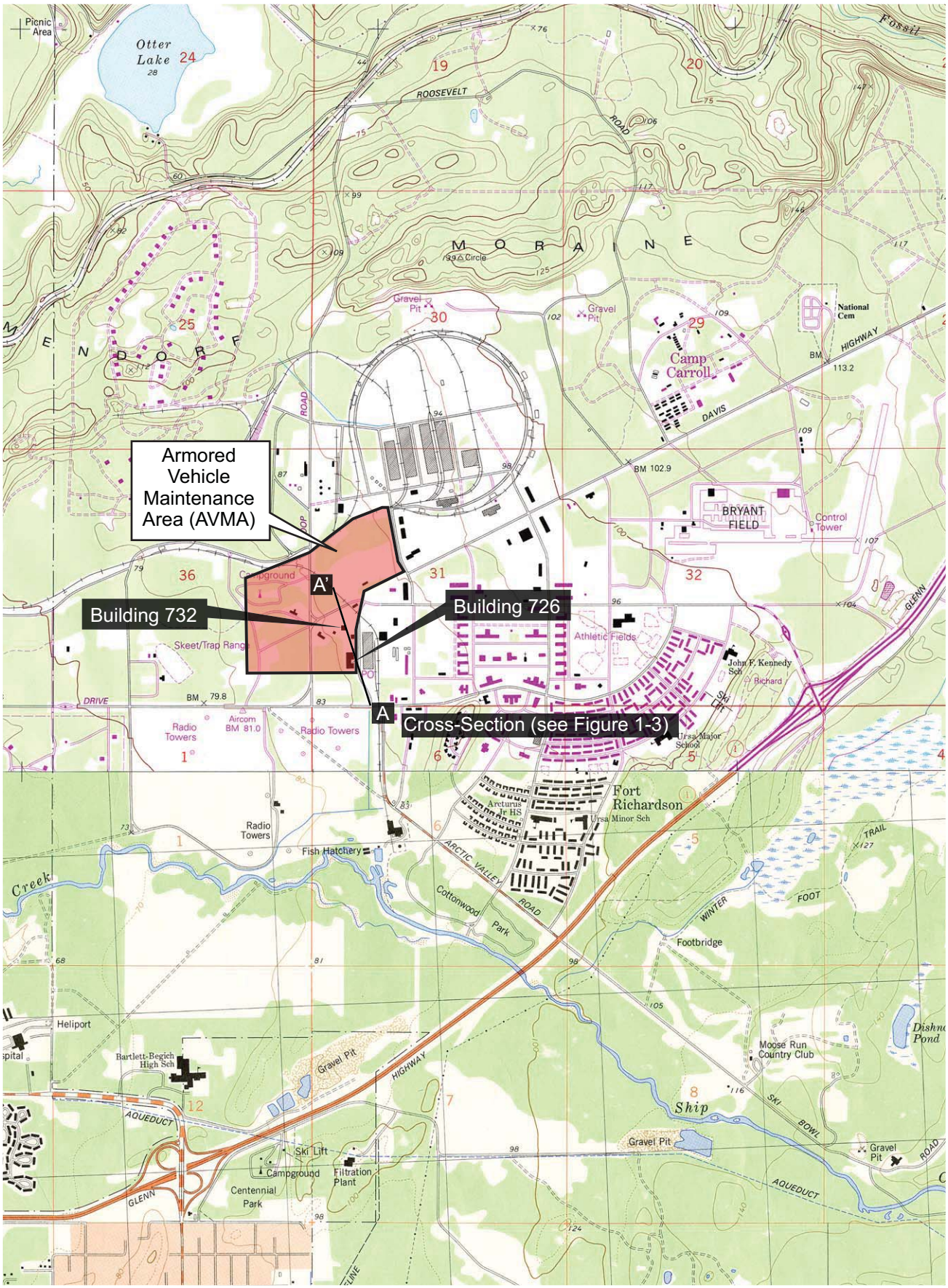


North

Not to Scale

Figure 1-1
Location Map, OUE AVMA
JBER-Richardson, Alaska

FIGURE 1-1 (BACK)



North

Figure 1-2
Site Locations Map, OUE AVMA
JBER-Richardson, Alaska

FIGURE 1-2 (BACK)

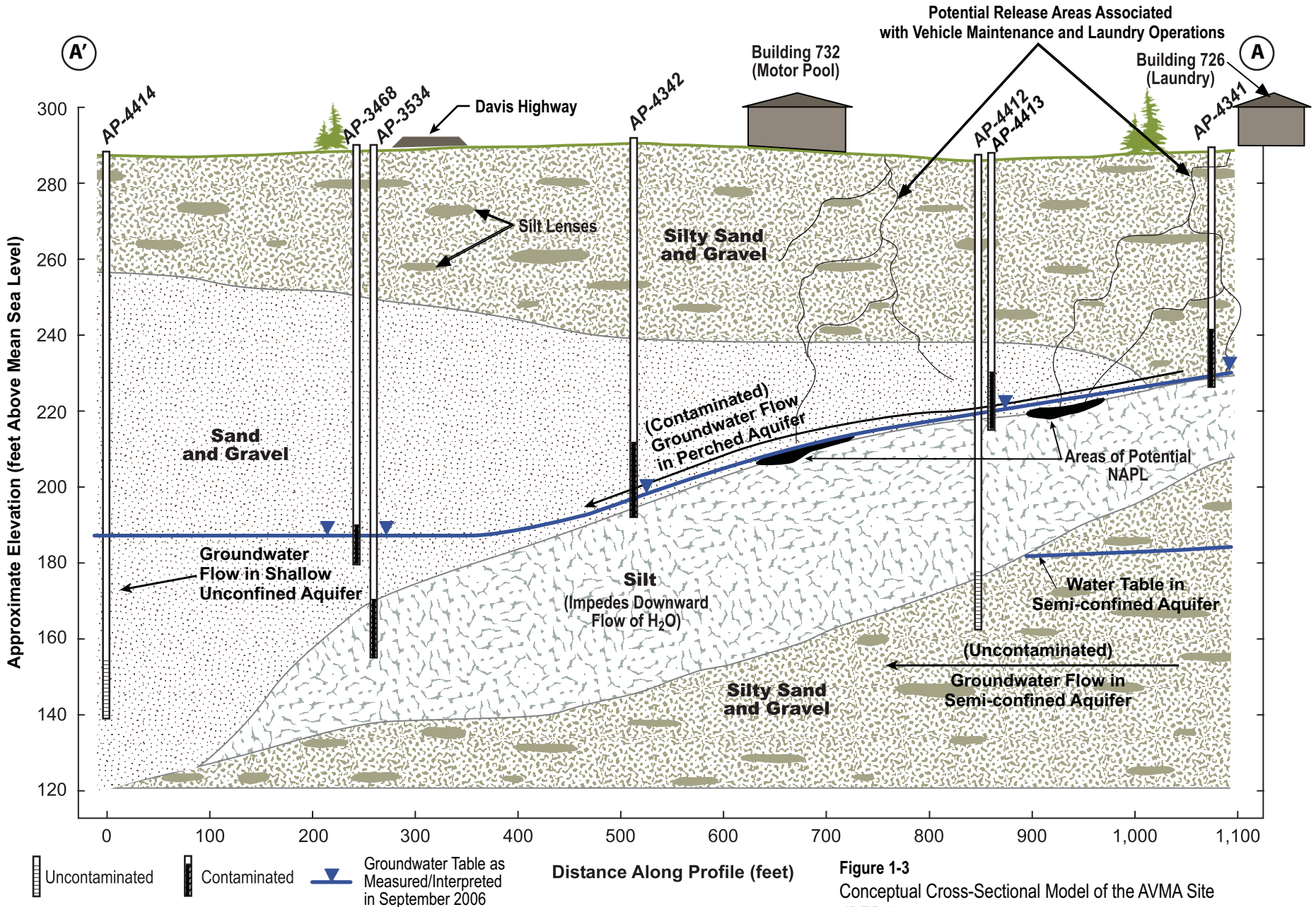


Figure 1-3
Conceptual Cross-Sectional Model of the AVMA Site
JBER-Richardson, Alaska

Figure prepared by CH2MHill Consultants. Used with permission of US Army Corps of Engineers.

FIGURE 1-3 (BACK)

TABLE 1-1
Timeline of Past Activities at OUE AVMA

Year	Organization/Company	Activity
1950-1966[a]	Fort Richardson Army Post	Low-level armored vehicle maintenance, oil and other waste material disposal
1990	USACE	Underground storage tank remediation sampling program
1993	Harding Lawson Assoc.	Site assessment at UST location
1994	ENSR	Field investigation
1996	Ecology and Environment Inc.	Background data analysis, soil borings, and groundwater sampling
2000	CRREL	Geophysical investigation
2001	CRREL	Historic aerial photography analysis and geophysical investigation
2001	USACE	Monitoring well installation, soil borings, groundwater sampling
2002-2003	CH2M HILL	Remedial Investigation and Risk Assessment
2003	CH2M HILL	Annual Groundwater Monitoring
2004	CH2M HILL	Feasibility Study
2004-2005	Satori Group Inc.	Annual Groundwater Monitoring
2005	CH2M HILL, Army, ADEC, EPA	Record of Decision signed
2006-2007	CH2M Hill	Semiannual Groundwater Monitoring
2008	Shannon & Wilson, Inc.	Annual Groundwater Monitoring
2009	Shannon & Wilson, Inc.	Semiannual Groundwater Monitoring
2010	Shannon & Wilson, Inc.	Annual Groundwater Monitoring

[a]It is undetermined when the facility was no longer used as a maintenance area
Source: *Preliminary Site Characterization Report* (CH2M HILL, 2003)

ADEC = Alaska Department of Environmental Conservation
CRREL = Cold Regions Research and Engineering Laboratory
EPA = U.S. Environmental Protection Agency
USACE = U.S. Army Corps of Engineers

SECTION 2

Groundwater Quality Monitoring Program

According to the selected remedy presented in the ROD for the AVMA of OUE (CH2M HILL, 2005), natural attenuation, institutional controls, and groundwater monitoring are the most appropriate and feasible actions for addressing the PCE-affected groundwater at the site. The role of groundwater monitoring is to evaluate the effectiveness of natural attenuation as the appropriate method for reducing contaminant concentrations to levels less than cleanup goals. The current groundwater monitoring schedule, established by the ROD, includes annual monitoring for 4 years (through 2009), with a subsequent reduction in frequency if contaminant levels are declining. Regular monitoring allows detection of trends that could trigger changes to the remediation process for the site or support site closure. Two specific trend benchmarks were established by the ROD:

- Monitoring will be discontinued when at least three subsequent sampling events indicate that chemical of concern (COC) concentrations have consistently dropped below maximum contaminant levels (MCLs).
- If monitoring results for any two consecutive sampling events indicate that contaminant levels are increasing, the U.S. Environmental Protection Agency (EPA), Alaska Department of Environmental Conservation (ADEC) , and U.S. Army will reevaluate the remedy.

2.1 Regulatory Requirements

The ROD established Federal Safe Drinking Water Act (Title 40, Parts 141 and 143, of the *Code of Federal Regulations* [CFR]) and Alaska Drinking Water Regulations ([Title 18, Chapter 80, of the *Alaska Administrative Code* [AAC]) as the sources for applicable or relevant and appropriate requirements (ARARs) for MCLs at OUE. In addition, the ROD identified one COC, PCE, which was detected in OUE groundwater at levels that pose a potential excessive lifetime cancer risk. Table 2-1 includes the COC and other analytes that have been historically detected in samples from one or more wells at concentrations greater than their MCLs. Complete analytical results are available in Appendix B.

2.2 Monitoring Locations

Ten wells were sampled in or near the AVMA during the November 2010 monitoring event. Well locations are provided in Figure 2-1 and include six wells within the area of PCE contamination, three downgradient wells, and one cross-gradient well for background.

TABLE 2-1
OUE Maximum Contaminant Levels

Analyte	Cleanup Levels (µg/L)	
	EPA 40 CFR 141/143	**ADEC 18 AAC 80**
Chemical of Concern		
Tetrachloroethene (PCE)	5	5
Other Detected Analytes		
Aluminum	50-200	NA
Arsenic	10	10

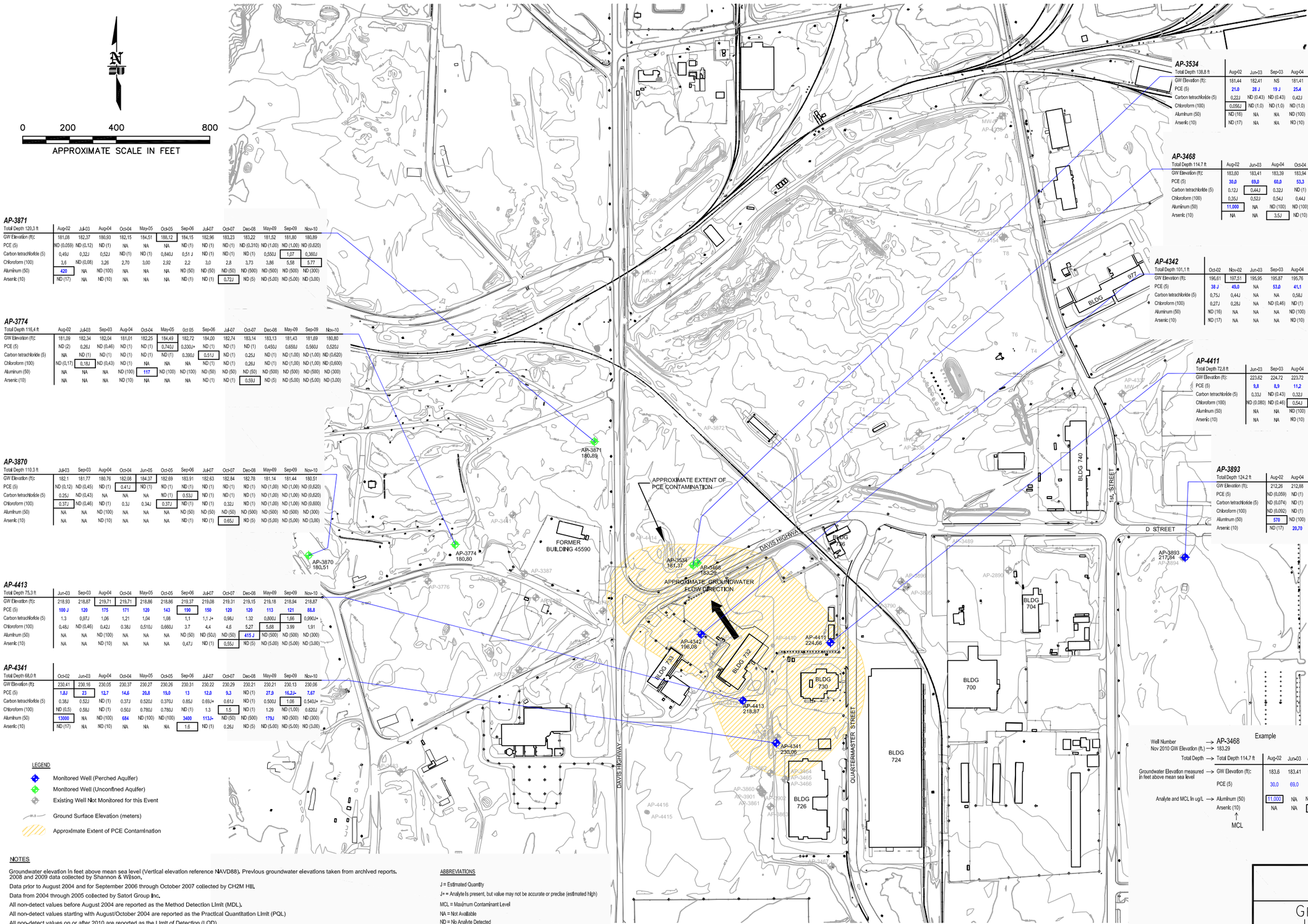
AAC = *Alaska Administrative Code*
ADEC = Alaska Department of Environmental Conservation
CFR = *Code of Federal Regulations*
EPA = U.S. Environmental Protection Agency
µg/L = micrograms per liter
NA = not applicable

2.3 Monitoring Frequency

Well sampling is required annually by the ROD, but has recently been conducted twice per year per Contract W911KB-08-D-0005, Task Order 001, typically in the spring and fall. In 2010, one monitoring event was conducted under Contract W911KB-08-D-0005, Task Order 0013. Depending on weather conditions, site accessibility, and other site activities, sampling dates may differ from year to year.

2.4 Groundwater Monitoring Parameters

Currently, volatile organic compound (VOC) concentrations in groundwater are being monitored for comparison to the ARAR MCLs listed in Table 2-1. In addition, under the current scope of work, groundwater also was evaluated for arsenic, aluminum, and a number of parameters that are indicators of biodegradation, which is a component of the natural attenuation process. The OUE monitoring parameters are identified in Table 2-2. November 2010 groundwater sampling forms and analytical data tables are included in Appendices A and B, respectively.



NOTES

Groundwater elevation in feet above mean sea level (Vertical elevation reference NAVD88). Previous groundwater elevations taken from archived reports. 2008 and 2009 data collected by Shannon & Wilson.

Data prior to August 2004 and for September 2006 through October 2007 collected by CH2M Hill.

Data from 2004 through 2005 collected by Satori Group Inc.

All non-detect values before August 2004 are reported as the Method Detection Limit (MDL).

All non-detect values starting with August/October 2004 are reported as the Practical Quantitation Limit (PQL)

All non-detect values on or after 2010 are reported as the Limit of Detection (LOD)

All concentrations are measured in µg/L.

Exceedances compared against EPA 40 CFR 141/143,and ADEC 18AAC80.

Regulatory Exceedances In Blue.

Maximum values are indicated by a box.

August/October 2002 metals data is for total metals with the exception of well AP-4342, which is dissolved metals.

ABBREVIATIONS

J = Estimated Quantity

J+ = Analyte is present, but value may not be accurate or precise (estimated high)

MCL = Maximum Contaminant Level

NA = Not Available

ND = No Analyte Detected

PCE = Tetrachloroethene

U= Analyte was not detected at the specific reporting limit

UJ = Analyte was not detected and the specified reporting limit may not be accurate or precise (estimated), or analyte was not detected and sample handling or QC failures may have resulted in a low bias (and thus a non-detect result).

OUE, FALL 2010
JBER-RICHARDSON, ALASKA

GROUNDWATER MONITORING LOCATIONS AND RESULTS

JANUARY 2012 32-1-17394

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

FIG. 2-1

FIGURE 2-1 BACK

TABLE 2-2
Groundwater Quality Monitoring Parameters

Purging Parameters[a]	**Equipment**
Water level	Water-level indicator
Conductivity	Calibrated YSI 556 field meter
Temperature	Calibrated YSI 556 field meter
Dissolved oxygen	Calibrated YSI 556 field meter
pH	Calibrated YSI 556 field meter
Oxidation Reduction Potential (ORP)	Calibrated YSI 556 field meter
Turbidity	Calibrated Hach Turbidimeter
Parameters	**Analytical Method**
Volatile organic compounds	SW8260
Sulfate/nitrate/nitrite	SW9056
Light gases (methane)	RSK 175
Dissolved metals (aluminum, arsenic, iron, and manganese)	SW6020

[a]Analyzed in the field at the time of sample collection

SECTION 3

Field Activities

3.1 Groundwater Elevations

Table 3-1 provides the depths to water, groundwater elevations, and the aquifers sampled. Measurements were taken on November 9, 2010. As discussed in Section 1.3, the ten wells sampled during the 2010 monitoring event were screened within either the shallow perched system or downgradient of the confluence of the perched and locally semi-confined systems where the locally semi-confined system becomes unconfined (Figure 1-3).

TABLE 3-1
Monitoring Well Information Summary and November 2010 Groundwater Conditions

Monitoring Well	Total Well Depth (ft)[a, b]	Top of Casing Elevation (ft)[C]	Depth to Water (ft)[a]	Groundwater Elevation (feet above mean sea level)[C]	Aquifer Sampled
AP-3468	114.7	293.38	110.09	183.29	Shallow, unconfined
AP-3534	138.8	293.05	111.68	181.37	Shallow, unconfined
AP-3774	116.4	289.46	108.66	180.80	Shallow, unconfined
AP-3870	110.3	281.92	101.41	180.51	Shallow, unconfined
AP-3871	120.3	293.46	112.57	180.89	Shallow, unconfined
AP-3893	124.2	307.49	92.41	215.08	Perched
AP-4341	68.0	294.23	64.17	230.06	Perched
AP-4342	101.1	293.36	97.28	196.08	Perched
AP-4411	72.8	292.82	68.16	224.66	Perched
AP-4413	75.3	291.36	72.49	218.87	Perched

[a]All depths are provided in feet below top of casing.
[b]Total well depths were measured during the December 2008 water level survey of OUE wells.
[C]Top of casing elevations used in groundwater elevation calculation from 2003 well survey except AP-3870, which has been back-calculated from the *Fort Richardson Operable Unit E Armored Vehicle Maintenance Area Spring 2007 Groundwater Monitoring Report* (CH2M HILL, 2007a).

3.2 Groundwater Sample Collection

Groundwater samples were collected using low-flow techniques in accordance with procedures outlined in the CH2M HILL *Quality Assurance Program Plan* (2002), *Supplemental Quality Assurance Project Plan for Fort Richardson Groundwater Sampling at Operable Unit B, Operable Unit E, and Building 762* (CH2M HILL 2007c), *Sampling and Analysis Plan for Groundwater Monitoring at Fort Richardson Operable Unit B, Operable Unit E, and Building 762* (CH2M HILL, 2007b), and *Sampling and Analysis Plan Technical*

Memorandum, Groundwater Monitoring Fort Richardson, Alaska (Shannon & Wilson, 2010) whenever possible.

3.3 Quality Assurance and Quality Control

Four types of quality assurance samples were collected to ensure data quality: trip blanks, equipment blanks, field duplicates, and matrix spike (MS)/matrix spike duplicate (MSD). For each sampling event, one field duplicate, one MS/MSD sample set, and one equipment blank and one trip blank per sample batch were submitted to the laboratory for analysis. The analytical Data Quality Evaluation Report and ADEC Laboratory Data Review Checklists are included in Appendix B.

3.4 Investigation-Derived Waste Handling and Disposal

All water generated from well purging and equipment decontamination was collected in a 55-gallon drum and transported to the environmental staging facility located at the petroleum, oil, and lubricants (POL)/dewatering facility near the corner of Warehouse Street and Loop Road for treatment and disposal.

SECTION 4

Results

This section discusses the analytical results for each analysis completed.

4.1 Analytical Methods

The parameters listed in Table 2-2 are divided into the following categories for discussion:

- VOCs
- Dissolved metals (aluminum and arsenic)
- Biodegradation parameters
  - Dissolved oxygen
  - Sulfate
  - Nitrate/nitrite
  - Methane
  - Dissolved metals (iron and manganese)

Figure 2-1 presents historical results for the COCs included in Table 2-1 for groundwater underlying the AVMA. Groundwater elevations and concentrations of carbon tetrachloride and chloroform are also included in Figure 2-1. The following subsections summarize the analytical results for each category of analysis. Complete validated analytical laboratory results are provided in Appendix B-2, and raw analytical data packages have been included electronically.

4.2 Analytical Results

4.2.1 Volatile Organic Compounds

VOCs detected during sampling of the 10 wells in November 2010 are as follows:

- PCE was detected in samples from seven wells (AP-3468, AP-3534, AP-3774, AP-4341, AP-4342, AP-4411, and AP-4413) with concentrations ranging from 0.520 J micrograms per liter (μg/L) detected in the sample from AP-3774 to 88.8 μg/L reported in the sample from AP-4413 (Figure 2-1). Except for the PCE concentration reported in AP-3774, the detected PCE concentrations exceed the MCL and occurred in wells that have histories of PCE contamination. Four of these wells (AP-4341, AP-4342, AP-4411, and AP-4413) are screened across the perched aquifer, directly below the AVMA. Three wells (AP-3468, AP-3534, and AP-3774) are screened downgradient from these three wells, at the confluence, or downgradient, of the perched aquifer system and the locally semi-confined system (Figure 1-3). PCE was not detected in two of the wells located downgradient of the extent of contamination, AP-3870 and AP-3871, or the cross-gradient well, AP-3893.

- Biodegradation of PCE in groundwater sometimes occurs naturally by the process of reductive dechlorination and produces intermediate daughter products including trichloroethene (TCE), 1,1-dichloroethene (DCE), cis- and trans-dichloroethene (cis-

DCE/trans-DCE), and vinyl chloride (VC). None of these PCE degradation daughter products were detected in the wells sampled during the 2010 sampling event.

- Carbon tetrachloride was detected in samples from four wells (AP-3871, AP-4341, AP-4342, and AP-4413) during the November sampling event. Carbon tetrachloride concentrations in the four samples ranged from 0.360J μg/L in the sample from AP-3871 to 0.990J μg/L in the sample from AP-4413. The reported carbon tetrachloride concentrations are less than the MCL of 5 μg/L and occurred in wells that have histories of carbon tetrachloride detections. With the exception of AP-3871, the remaining wells are screened across the perched aquifer, directly below the AVMA.
- Chloroform was detected in three wells (AP-3871, AP-4341, and AP-4413) of the ten on-site wells during the November sampling event. Chloroform concentrations detected ranged from 0.620J μg/L (AP-4341) to 5.77 μg/L (AP-3871). These chloroform levels are less than the ADEC MCL in 18 AAC 75 of 100 μg/L.

4.2.2 Biodegradation Parameters

The evaluation of geochemical parameters provides a brief look at indicators of biodegradation of chlorinated compounds (such as PCE) to determine whether they provide weight-of-evidence support for the existence of possible biodegradation pathways at the AVMA. These pathways could be an effective route of natural attenuation for PCE under certain biochemical conditions, namely anaerobic environments in the presence of petroleum products. During the 2002-2003 RI (CH2M HILL, 2004), petroleum compounds, including diesel-range organics, residual-range organics, and gasoline-range organics, were detected sporadically at low levels within the extent of contamination. These compounds are no longer monitored at the AVMA.

The following evaluation is based on a comparison of geochemical concentrations within the extent of contamination, which includes wells AP-3468, AP-3534, AP-4341, AP-4342, AP-4411, and AP-4413, and with the cross-gradient background well AP-3893. Relative to background conditions, dissolved oxygen, nitrate, and sulfate concentrations are expected to be lower; dissolved iron, dissolved manganese, and methane are expected to be higher, within the extent of contamination if biodegradation is occurring. The following sections provide an evaluation of the geochemical results.

Dissolved Oxygen

Dissolved oxygen is the most energetically favorable electron acceptor for biodegradation and is used strictly under aerobic conditions. However, for PCE biodegradation to occur anaerobic conditions must exist and a less energetically favorable electron acceptor must be utilized (i.e. nitrate/nitrate, dissolved iron, or manganese). Dissolved oxygen is detrimental to the strictly anaerobic bacteria that are responsible for reductive dechlorination of longer-chain chlorinated compounds such as PCE; thus, anaerobic or anoxic conditions (dissolved oxygen concentrations less than 2 milligrams per liter [mg/L]) are required for PCE biodegradation. The presence of petroleum hydrocarbons also benefits this process.

Dissolved oxygen measurements within the area of contaminated groundwater were generally greater than 2 mg/L, which indicates that aerobic conditions are present within the

plume boundary. Complete dissolved oxygen results are included on the Water Sampling Logs in Appendix A.

Total Nitrate/Nitrite

Following dissolved oxygen, nitrate is the second most energetically favorable electron acceptor and can be utilized by facultative anaerobic bacteria. Standard laboratory analysis for nitrate includes analysis of the total nitrate and nitrite due to the short reaction life of nitrite which chemically converts to nitrate rapidly under natural conditions. As a result, nitrite concentrations are typically very low or non-detect in groundwater.

Conditions at the AVMA are currently aerobic; as a result, evidence of denitrification in nitrate levels was not expected. Nitrate was detected in all wells but one (AP-3893) at concentrations ranging from 0.968 mg/L to 2.73 mg/L. Nitrate was not detected in samples collected from the background well, AP-3893. Nitrite was not detected in the groundwater samples. Because the ratios of nitrate vs. nitrite are necessary to determine if denitrification is taking place, these results do not provide support that nitrate/nitrite play a key role in in-situ biodegradation at this site.

Dissolved Iron and Manganese

Dissolved iron was detected in two wells (AP-4342 and AP-4411) at 3.15 mg/L and 5.26 mg/L, respectively. There is no clear pattern of iron being used as an electron acceptor at the site.

Dissolved manganese was detected in each of the on-site wells (with the exception of Well AP-4341) during the November 2010 sampling event. Dissolved manganese concentrations in the six plume wells were between 0.661J µg/L and 128 µg/L, and in non-plume wells at concentrations between 1.49J µg/L and 45.2 µg/L.

These results indicate that biodegradation is not occurring through the anaerobic iron and manganese reduction pathways.

Sulfate

Sulfate was detected in each of the on-site wells during the November 2010 sampling event, with concentrations ranging from 16.4 mg/L to 25.8 mg/L. These results indicate that sulfate is not being used as an electron acceptor for in-situ biodegradation within the area of contaminated groundwater.

Methane

Samples from four wells collected during the November 2010 sampling event contained methane concentrations ranging from 0.39 µg/L in AP-3871 to 0.62µg/L in AP-4413.

4.2.3 Dissolved Aluminum and Arsenic

Aluminum was detected in two wells (AP-4342 and AP-4411) during the November sampling event at concentrations that exceed the MCL.

Arsenic was detected in the background well (AP-3893) and AP-4411 during the November 2010 sampling event. The dissolved arsenic concentration reported in the sample from AP-

3893 exceeds the MCL. Table 4-1 summarizes the contaminants found in OUE groundwater that exceed MCLs.

TABLE 4-1
Contaminants that Exceed MCLs and Their Locations at the AVMA, November 2010

Contaminant	Cleanup Level[a] (µg/L)	November 2010
PCE	5	
		AP-3468 (54.3 µg/L)
		AP-4413 (88.8 µg/L)
		AP-4341 (7.67 µg/L)
		AP-3534 (23.1 µg/L)
		AP-4342 (53.2 µg/L)
		AP-4411 (10.5 µg/L)
Aluminum	50	AP-4342 (2,680 µg/L)
		AP-4411 (4,170 µg/L)
Arsenic[b]	10	AP-3893 (24.4 µg/L)

[a]Cleanup levels from 18 AAC 80 and 40 CFR 141/143.
[b]Arsenic levels are believed to be attributable to natural sources.
J= estimated quantity
µg/L = micrograms per liter

4.3 Analysis of Trends

4.3.1 PCE

To examine trends in PCE concentrations in wells within the approximate extent of PCE contamination (Figure 2-1), past results are presented graphically for individual wells AP-3468, AP-3534, AP-4341, AP-4342, AP-4411, and AP-4413 in Figure 4-1.

Available historic data for these six wells includes 7 to 8 years of results. To date, PCE concentrations have tended to oscillate within two standard deviations of the mean for each well, with very few exceptions. Overall, increasing or decreasing trends are not definitively apparent. The most recent results appear to fall within the normal range of variability. Definitive trends in PCE concentrations at the AVMA may become apparent over time as monitoring continues and more data are collected.

A Mann-Kendall (M-K) statistical analysis was performed to help statistically identify PCE concentration trends at the AVMA in wells within the extent of contamination. M-K analysis is designed to indicate whether an increasing or decreasing trend is present, and to give a percentage that represents the statistical confidence interval of the increase or decrease. A confidence interval of 90 percent or above is considered a “significant” indication that a trend exists; however, it does not indicate the magnitude of the increase or decrease.

According to the M-K analysis, a statistically significant increasing PCE concentration trend exists at well AP-4342. The results for the five other wells within the extent of contamination do not show a statistically significant trend for PCE.

The use of a “seasonal” version of the M-K analysis was also considered. This version of M-K analysis is useful in identifying trends when seasonal variations (often related to fluctuations in groundwater levels) are affecting concentrations. At the AVMA, however, groundwater elevations are not highly variable and do not show strong seasonal variations. In addition, sampling has not been conducted on a consistent seasonal schedule, which makes sorting results into “seasons” difficult. As a result, the use of a seasonal M-K analysis was determined to not be useful at this site.

Samples from the three downgradient wells (AP-3774, AP-3870, and AP-3871) and cross-gradient well AP-3893 have historically produced PCE results ranging from non-detect to occasional low-level concentrations that are less than the MCL of 5 µg/L. Except for the PCE concentration detected in well AP-3774 (0.520 J µg/L), PCE was not detected in the three downgradient wells or the cross-gradient well. These data suggest that the extent of contamination continues to remain relatively unchanged.

Figure 4-1: PCE Concentration Trends for Wells within the Extent of Contamination

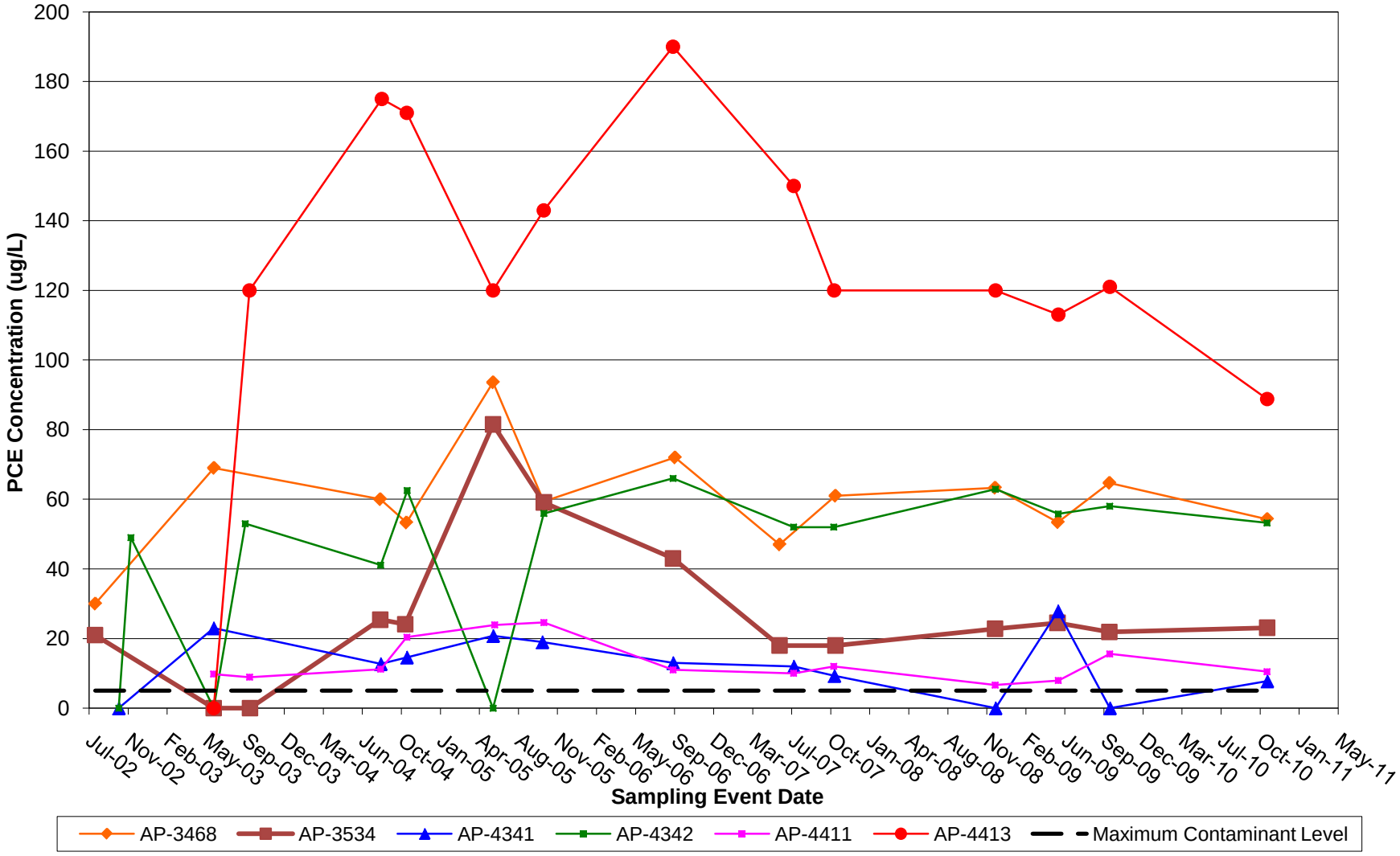


FIGURE 4-1 BACK

4.3.2 Other Detected VOCs

VOC breakdown products (TCE, DCE, cis-DCE, trans-DCE, and VC) of PCE biodegradation were not detected, indicating that these compounds do not exist in the AVMA wells within the extent of PCE contamination. This continued trend suggests that biodegradation is not occurring through reductive dechlorination pathways.

The other detected VOCs, including carbon tetrachloride and chloroform, continue to exist in AVMA wells both within and outside the extent of PCE contamination. These analytes are frequently detected at concentrations less than established MCLs and tend to fluctuate between non-detect and several µg/L (see Figure 2-1). These compounds are not breakdown products of PCE and appear to exist at the site independently from PCE contamination. Chloroform is a daughter product of anaerobic carbon tetrachloride degradation, which suggests that anaerobic degradation of carbon tetrachloride may be occurring on site. No significant increasing or decreasing trends are evident for these compounds.

4.3.3 Dissolved Aluminum

Available historical aluminum results are shown in Figure 2-1. Historical aluminum levels at OUE have sporadically exceeded the MCL of 50 µg/L in 8 of the 10 wells. Results from the November 2010 sampling event included exceedances in Wells AP-4342 and AP-4411. Dramatic differences in concentrations often exist from year to year within individual wells. For example, overall results from well AP-4411 have ranged from non-detect to 22,300 µg/L. These differences in observed results may be the outcome of some of the earlier sampling results being reported as total metals results; whereas more recent results (2004 to the present) have been reported as only dissolved metals. The aluminum concentrations in the AVMA wells are currently considered to be representative of background levels.

4.3.4 Dissolved Arsenic

Arsenic levels are also believed to be the result of natural background levels in the area. Historical dissolved arsenic levels have not exceeded the MCL (10 µg/L) within the area of PCE contamination. However, results from the November sampling event include one exceedance in the sample from cross-gradient well AP-3893 with a reported dissolved arsenic concentration of 24.4 µg/L. Note that this result represents a historical high for arsenic in this well, which consistently has the highest arsenic concentrations at this site.

4.3.5 Biodegradation Parameters

Natural attenuation parameter results for dissolved oxygen, iron, methane, sulfate, and nitrate/nitrite were similar to previous results (CH2M HILL, 2006; CH2M HILL, 2007a, CH2M HILL 2007d). It has been determined that the concentrations of these parameters, along with the lack of PCE daughter products and historically low presence of petroleum products, suggest that biodegradation is not a major component of natural attenuation at the site. The primary natural attenuation pathway for PCE at the AVMA is considered to be dilution.

SECTION 5

Conclusions

Conclusions based on historical and current data through the November 2010 monitoring event are as follows:

- PCE is the only established COC for OUE AVMA. The area of the extent of PCE contamination appears to be stable and contained; samples from the three downgradient wells continue to have non-detect or trace results. No significant increasing or decreasing trends in the PCE-affected area are statistically apparent from the historical monitoring data, except for the increasing PCE concentration trend interpreted at well AP-4342.
- The results of biodegradation parameters and the near-absence of PCE breakdown products continue to suggest that biodegradation of PCE may be limited at the AVMA and that the primary mechanism of natural attenuation at the site continues to be dilution. For sites where biodegradation is not playing a key role in the attenuation process, monitoring and evaluation of biodegradation parameters provides very little value towards the understanding of the site contaminant conditions. Detected concentrations of other VOCs (such as chloroform), which are considered to be independent of the PCE contamination, continue to exist at low levels (below MCLs) and do not demonstrate increasing or decreasing trends.
- Aluminum detections greater than the MCL were identified in Wells AP-4342 and AP-4411 during the 2010 sampling event. The source of aluminum, which is detected sporadically in some of the OUE AVMA wells, is currently believed to be natural (background).
- Arsenic levels in groundwater at the AVMA in well AP-3893 exceeded MCLs during the 2010 monitoring event, consistent with historical results.

SECTION 6

References

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United States Environmental Protection Agency, 2001, *40 CFR Part 142, National Secondary Drinking Water Regulations.*

Appendix A
Field Data Collection Forms

Appendix A1
Water Sampling Logs

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Pty Cloudy ~ 30°F 11/12/10

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: ~25°F Fog 11/9/10
Site: OUE Well No.: AP-4411
Date: 11/9/10 ; 11/12/10 Time Started: 1113 ; 1401 Time Completed: 1205 ; 1421

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition): Good
Well Identification (labeled with well numbers): No
Well locking cap and lock present: Yes ☐ No ☒ Notes: no lock - flush monument

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1018 Date of Depth Measurement: 11/9/10
Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 72.80 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 68.16
Water Column in Well: 4.64 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.74 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/9/10 Time Started: 1117 Time Completed: 1200
Four Well Volumes: 2.96 (Gallons in Well x 4)
Gallons Purged: 3.2 Total Depth of Pump Placement: NA
Maximum Drawdown (ft BTOC): 68.46 Pump Rate (Hz): NA
Well Purged Dry: Yes ☒ No ☐ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
11/9/10 1122	0.2	NA	N.M.	7.67	614	0.0	7.46	322.9	98.6
1129	0.2	NA	68.93	7.36	602	0.0	7.46	332.3	OVERRANG
1133	0.2	NA	69.48	6.97	567	0.0	7.47	340.1	O.R.
1137	0.2	NA	70.42	6.73	594	0.0	7.46	345.2	O.R.
1140	0.2	NA	71.26	6.56	602	0.0	7.47	344.5	O.R.
1144	0.2	NA	71.80	6.29	600	0.0	7.48	346.4	O.R.
1148	0.2	NA	72.12	6.44	598	0.0	7.53	341.6	O.R.

SAMPLING DATA

Odor: None Color: turbid brown
Sample Designation: 10FROAWA16 Time / Date: 14:05 / 11-12-10
QC Sample Designation: — Time / Date: —
Evacuation Method: Grundfos Submersible Pump / Other: Disp. Bailer
Sampling Method: Grundfos Submersible Pump / Other: DISP. BAILER
Remarks: Purged dry
Sampling Personnel: BENJAMIN TURNER & SHAYLA SWEDLUND

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-4411

Date:

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
12-10 14:08	0.2	NA	N.M.	6.71	590	18.6	7.73	164.0	385

Sampling Personnel: Shayla Swedlund + Ben Turner

At time of sample collection

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WELL PURGED DRY LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Pty Cloudy ~30°F 11/12/10
Area: OUE Well No.: AP-4411
Date: 11/9/10; 11/10/10; 11/12/10 Time Started: 1113; 1058; 1401 Time Completed: 1205; 1115; 1421

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1018 Date of Depth Measurement: 11/9/10
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 72.80 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 68.16
Water Column in Well: 4.64 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.74 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/9/10 Time Started: 1117 Time Completed: 1200
80% Recovery Water Column: 3.71 (Water Column in Well x 0.8)
80% Recovery DTW: 69.09 (Initial DTW + (Water Col. – 80% Recovery Water Col.)

Purging	Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate
1	1200 11/9/10	1100 11/10/10	69.20	NA
2	1111 11/10/10	0930 11/12/10	68.70	NA
3	0938 11/12/10	1402 11/12/10	68.70	NA

IDW
11/9/10 - 1.4 gal
11/10/10 - 0.7 gal
11/12 - 1 gal
0.1 gal

SAMPLING DATA

Odor: none Color: turbid brown
Sample Designation: 10FROAWA16 Time / Date: 1405 11/12/10
QC Sample Designation: — Time / Date: —

Evacuation Method: Grundfos Submersible Pump / Other: Disp Bailer
Sampling Method: Grundfos Submersible Pump / Other: Disp Bailer

Remarks: Motor Pool Closed for Veterans Day on 11/11/10 - could not access well to purge.
Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Ptly Cloudy ~25-30°F
Site: OVE Well No.: AP-3893
Date: 11/10/10; 11/11/10 Time Started: 1439; 0946 Time Completed: 1535; 1200

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition): Good
Well Identification (labeled with well numbers): Yes
Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1056 Date of Depth Measurement: 11/9/10
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 124.15 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 92.41
Water Column in Well: 31.74 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 5.08 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/11/10 Time Started: 1025 Time Completed: 1140
Four Well Volumes: 20.32 (Gallons in Well x 4)
Gallons Purged: 92.71 ss Depth of Pump Placement: ~122
Maximum Drawdown (ft BTOC): 11 Total Pump Rate (Hz): 218.1
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
NM	1.3	Not measured - Got phone call + missed parameter collection							
1044	2.6	0.7	92.52	9.75	312	1.2	8.17	165.0	18.3
1055	3.9	0.7	92.52	9.87	311	1.1	8.18	151.4	10.4
1102	5.2	0.7	92.52	9.85	310	1.4	8.18	132.6	8.59
1112	6.5	0.7	92.52	9.83	309	1.2	8.19	128.7	6.93
1119	7.8	0.7	92.52	9.89	308	1.2	8.19	153.8	8.17
1129	9.1	0.7	92.52	10.31	308	1.1	8.19	132.5	6.08

SAMPLING DATA

Odor: none Color: Clear
Sample Designation: 10FROAWA10 Time / Date: 1140 11/11/10
QC Sample Designation: — Time / Date: —
Evacuation Method: Grundfos Submersible Pump / Other:
Sampling Method: Grundfos Submersible Pump / Other:
Remarks: Started 11/10/10 - tubing too short - tried to splice pieces together but unsuccessful due to temperatures - came back 11/11/10 to pump.
Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-3893

Date: 11/11/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1140	10.4	0.7	92.52	10.38	308	1.2	8.19	130.6	6.86

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Foggy ~ 20°F
Site: OUE Well No.: AP-4342
Date: 11/10/10 Time Started: 1539 Time Completed: 1643

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition: Good
Well Identification (labeled with well numbers): Yes
Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1028 Date of Depth Measurement: 11/9/10
Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 101.10 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 97.28
Water Column in Well: 3.82 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.61 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/10/10 Time Started: [illegible] Time Completed: 1620
Four Well Volumes: 2.44 (Gallons in Well x 4)
Gallons Purged: Depth of Pump Placement: NA
Maximum Drawdown (ft BTOC): 97.58 Pump Rate (Hz): NA
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time: (P.M.)	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
3:51	0.2	N/A	97.40	3.90	424	1.6	7.47	317.0	11.4
3:58	0.2	NA	97.67	4.53	416	1.8	7.50	319.0	121
4:03	0.2	NA	97.61	4.61	433	1.8	7.56	317.0	345
4:06	0.2	NA	97.79	4.63	431	1.8	7.56	319.0	431
4:10	0.2	NA	N.M	4.63	433	1.8	7.59	317.3	593
4:15	0.2	NA	97.60	4.88	428	1.9	7.56	319.8	813

SAMPLING DATA

Odor: none Color: turbid brown
Sample Designation: 10FROAWA06 Time / Date: 16:15 / 11-10-10
QC Sample Designation: 10FROAWA07 Time / Date: 16:20 / 11-10-10
Evacuation Method: Grundfos Submersible Pump / Other: HAND BAILER
Sampling Method: Grundfos Submersible Pump / Other: HAND BAILER
Remarks:

Sampling Personnel: BENJAMIN TURNER & SHEILA SWEDLUND

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-4342

Date: 11/10/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)

Sampling Personnel: Shayla Swedlund & Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Foggy ~20°F
Site: OUE Well No.: AP-3871
Date: 11/10/10 Time Started: 1249 Time Completed: 1434

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition: Good
Well Identification (labeled with well numbers): Yes
Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1002 Date of Depth Measurement: 11/9/10
Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 120.30 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 112.57
Water Column in Well: 7.73 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 1.24 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/10/10 Time Started: 1315 Time Completed: 1404
Four Well Volumes: 4.96 (Gallons in Well x 4)
Gallons Purged: 3.0 Total Depth of Pump Placement: ~118
Maximum Drawdown (ft BTOC): 112.81 Pump Rate (Hz): 241.0
Well Purged Dry: Yes ☐ No ☐ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1333	0.3	0.3	112.62	5.13	412	1.9	7.47	372.4	57.1
1336	0.6	0.3	112.63	5.30	411	1.9	7.47	359.1	70.2
1338	0.9	0.3	112.62	5.11	412	1.9	7.48	346.1	70.1
1344	1.2	0.2	112.62	5.72	411	1.7	7.47	312.6	95.2
1350	1.5	0.1	112.62	9.25	413	2.0	7.47	285.4	106
1355	1.9	0.1	112.62	9.55	414	1.6	7.48	273.6	104
1359	2.2	0.1	112.62	9.94	413	1.5	7.48	255.1	101

SAMPLING DATA

Odor: none Color: Slightly turbid brown.
Sample Designation: 10FROAWA05 Time / Date: 1405 / 11/10/10
QC Sample Designation: ← Time / Date: —
Evacuation Method: ~~Grundfos~~ Submersible Pump / Other:
Sampling Method: Grundfos Submersible Pump / Other:
Remarks: Surger - rate fluctuates
Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-3871

Date: 11/10/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1404	2.5	0.3	112.62	10.50	410	1.5	7.49	254.0	86.4

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Foggy ~20°F
Site: OVE Well No.: AP-3870
Date: 11/10/10 Time Started: 1120 Time Completed: 1241

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition: Good
Well Identification (labeled with well numbers): Yes
Well locking cap and lock present: Yes ☐ No ☒ Notes: No lock - cap broken

This part is missing

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 0930 Date of Depth Measurement: 11/9/10
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 110.25 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 101.41
Water Column in Well: 8.84 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 1.41 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/10/10 Time Started: 1147 Time Completed: 1215
Four Well Volumes: 5.64 (Gallons in Well x 4)
Gallons Purged: 4.2 Total Depth of Pump Placement: ~108
Maximum Drawdown (ft BTOC): 101.71 Pump Rate (Hz): 223.9
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1157	0.4	0.2	101.52	4.98	420	1.5	7.35	405.6	269
1200	0.8	0.4	101.51	5.31	419	1.4	7.35	389.2	251
1203	1.2	0.4	101.51	6.18	414	2.0	7.37	374.3	203
1206	1.6	0.4	101.52	7.99	417	1.9	7.38	355.6	153
1208	2.0	0.4	101.51	9.00	416	1.7	7.38	344.3	97.8
1210	2.4	0.4	101.50	10.18	420	1.7	7.39	332.0	68.0
1215	2.8	0.5	101.50	10.19	421	1.7	7.39	326.1	56.9

SAMPLING DATA

Odor: None Color: Clear
Sample Designation: 10FROAWA04 Time / Date: 1215 ; 11/10/10
QC Sample Designation: — Time / Date: —
Evacuation Method: Grundfos Submersible Pump / Other:
Sampling Method: Grundfos Submersible Pump / Other:
Remarks: rate of flow speeding up - no sig drawdown so went > 0.1 L/min
Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OVE

Well No.: AP-3870

Date: 11/10/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1215	3.2	0.5	101.50	10.19	421	1.7	7.39	322.0	48.1

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: ~25°F ; Overcast
Site: QUE Well No.: AP-3774
Date: 11/9/10 Time Started: 1258 Time Completed: 1048

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition: Good
Well Identification (labeled with well numbers): Yes
Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 0951 Date of Depth Measurement: 11/9/10
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 116.40 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 108.66
Water Column in Well: 7.74 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 1.24 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/9/10 i 11/10/10 Time Started: 1358 i 0937 Time Completed: 1010
Four Well Volumes: 4.96 (Gallons in Well x 4)
Gallons Purged: ~2.6 Depth of Pump Placement: 114
Maximum Drawdown (ft BTOC): ~~108.99~~ 108.96 Pump Rate (Hz): ~32.2
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
9:45	0.31	0.2	108.77	5.49	512	0.0	7.11	477.5	274
9:48	0.31	0.2	108.77	5.80	513	0.0	7.10	431.6	205
9:53	0.31	0.2	108.81	6.81	510	0.0	7.14	397.7	134
9:56	0.31	0.2	108.88	9.24	507	0.0	7.14	370.3	97.0
9:59	0.31	0.2	108.75	10.36	509	0.6	7.14	336.8	136.0
10:03	[illegible]	0.2	[illegible]72	11.05	[illegible]	0.0	7.14	310.8	95.1
10:06	0.31	0.2	108.72	11.43	509	0.0	7.13	297.3	56.2

SAMPLING DATA

Odor: None Color: Clear
Sample Designation: 10FR0AWA03 Time / Date: 10:10 / 11-10-10
QC Sample Designation: — Time / Date:
Evacuation Method: Grundfos Submersible Pump / Other:
Sampling Method: Grundfos Submersible Pump / Other:
Remarks:
Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-3774

Date: 11/10/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
16:07	6.31	0.7	168.75	11.61	509	6.0	7.14	284.6	44.9
16:09	6.31	0.7	168.75	11.67	508	6.2	7.14	283.7	37.1

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Foggy ~25°F
Site: OVE Well No.: AP-3468
Date: 11/9/10 Time Started: 1505 Time Completed: 1652

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition: Good
Well Identification (labeled with well numbers): yes
Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1035 Date of Depth Measurement: 11/9/10
Measuring Point (MP): ~~Top of PVC Casing~~ / Top of Steel Protective Casing AL / Other:
Diameter of Casing: 2 Well Screen Interval: unknown
Total Depth of Well Below MP: 114.70 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 110.09
Water Column in Well: 4.61 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.74 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/9/10 Time Started: 1520 Time Completed: 1640
Four Well Volumes: 2.96 (Gallons in Well x 4)
Gallons Purged: 1.6 Depth of Pump Placement: NA
Maximum Drawdown (ft BTOC): 110.39 Pump Rate (Hz): NA
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1510	0.2	NA	110.40	5.00	560	0.0	7.08	349.1	4.38
1514	0.2	NA	110.66	5.56	580	0.0	7.35	342.3	1.03
1521	0.2	NA	110.69	5.31	587	0.0	7.42	342.1	2.69
1525	0.2	NA	110.86	5.45	586	0.0	7.39	347.9	4.14
1530	0.2	NA	111.03	5.55	589	0.0	7.38	344.9	5.10
1535	0.2	NA	111.20	5.75	585	0.0	7.40	350.7	7.47
1539	0.2	NA	111.25	5.56	583	0.0	7.39	354.1	6.17

SAMPLING DATA

Odor: None Color: Sl. turbid Brown
Sample Designation: 1CFRCAWA02 Time / Date: 1545 / 11-9-10
QC Sample Designation: NONE Time / Date:
Evacuation Method: Grundfos Submersible Pump / Other: DISPOSABLE BAILER
Sampling Method: Grundfos Submersible Pump / Other: DISPOSABLE BAILER
Remarks:
Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

CONTINUED ON BACK →

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-346

Date: 11/9/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1543	6.12	NA	111.27	5.55	581	6.0	7.39	350.6	831

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WATER SAMPLING LOG

Shannon & Wilson, Inc.

11/9/10

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: ~25°F; Foc

Site: OUF Well No.: AP-4341

Date: 11/9/10 ; 11/12/10 Time Started: 1208 ; 0830 Time Completed: 1245 ; 0848

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good

Casing Condition (bent, dented, paint condition: Good

Well Identification (labeled with well numbers): Yes

Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1047 Date of Depth Measurement: 11/9/10

Measuring Point (MP): (Top of PVC Casing) / Top of Steel Protective Casing / Other:

Diameter of Casing: 2 Well Screen Interval: Unknown

Total Depth of Well Below MP: 67.96 Product Thickness, if noted: none

Depth-to-Water (DTW) Below MP: 64.17

Water Column in Well: 3.79 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 0.61 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/9/10 Time Started: 12/2; Time Completed: 1245;

Four Well Volumes: 2.44 (Gallons in Well x 4)

Gallons Purged: Depth of Pump Placement: NA

Maximum Drawdown (ft BTOC): 64.47 Pump Rate (Hz): NA

Well Purged Dry: Yes ☒ No ☐ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1216	0.2	NA	N.M.	6.52	493	0.0	7.49	545.7	4.33
1221	0.2	NA	66.02	6.24	499	0.0	7.45	515.2	151
1225	0.2	NA	66.62	5.95	502	0.0	7.46	502.8	351
1229	0.2	NA	67.04	6.14	500	0.0	7.48	488.9	462
1233	0.2	NA	67.35	6.09	498	0.0	7.55	478.6	O.R.
1235	0.2	NA	67.61	6.02	498	0.0	7.58	471.9	O.R.
*8:38	0.2	NA	~~67.65~~ 65.16*	8.25	492	18.7	7.50	494.5	8.94

+sample collection

SAMPLING DATA

Odor: none Color: sl. turbid brown

Sample Designation: 10FROAWA13 Time / Date: 0838 11/12/10

QC Sample Designation: — Time / Date:

Evacuation Method: Grundfos Submersible Pump / Other: Disp Bailer

Sampling Method: Grundfos Submersible Pump / Other: Disp Bailer.

Remarks: Purged dry

* DRAWDOWN @ SAMPLE COLLECTION MEASURED AFTER BAILER WITHDRAWN

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-4341

Date: 11/12/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)

AP4

Sampling Personnel: _____

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WELL PURGED DRY LOG

Shannon & Wilson, Inc.

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: ~25°F Fog 11/9/10
Area: OUE Well No.: AP-4341
Date: 11/9/10 ; 11/12/10 Time Started: 1208 ; 0830 Time Completed: 1245 ; 0848

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1047 Date of Depth Measurement: 11/9/10
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2" Well Screen Interval: unknown
Total Depth of Well Below MP: 67.96 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 64.17
Water Column in Well: 3.79 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.61 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/9/10 Time Started: 1212 Time Completed: 1245 ;
80% Recovery Water Column: 3.03 (Water Column in Well x 0.8)
80% Recovery DTW: 64.93 (Initial DTW + (Water Col. – 80% Recovery Water Col.)

Purging	Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate
1	1245 11/9/10	0839 11/10/10	64.90	NA
2	0851 11/10/10	0935 11/11/10	64.95	NA
3	0943 11/11/10	0832 11/12/10	64.94	NA

IDW
11/9/10 - 1.2 gal
11/10/10 - 0.8 gal
11/11/10 - 0.8
11/12/10 - 0.2

SAMPLING DATA

Odor: none Color: sl. turbid brown
Sample Designation: 10FROAWA13 Time / Date: 0838 ; 11/12/10
QC Sample Designation: — Time / Date: —

Evacuation Method: Grundfos Submersible Pump / Other: Disp Bailer
Sampling Method: Grundfos Submersible Pump / Other: Disp Bailer

Remarks: left Bailer in well between days.

Sampling Personnel: Shayla Swedlund - Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Pthy cloudy ~30°F 11/12/10

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Pthy Cloudy ~25-30°F 11/11/10

Site: OUE Well No.: AP-3534

Date: ~~11/10~~ 11/11/10; 11/12/10 Time Started: 1205; 0947 Time Completed: 1422; 1216

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good

Casing Condition (bent, dented, paint condition: Good

Well Identification (labeled with well numbers): Yes

Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1037 Date of Depth Measurement: 11/9/10

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:

Diameter of Casing: 2 Well Screen Interval: unknown

Total Depth of Well Below MP: 138.75 Product Thickness, if noted: none

Depth-to-Water (DTW) Below MP: 111.68

Water Column in Well: 27.07 (Total Depth of Well Below MP - DTW Below MP)

Gallons per foot: 0.16

Gallons in Well: 4.33 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/11/10; 11/12/10 Time Started: 1230; 1007 Time Completed: 1422; 1154

Four Well Volumes: 17.32 (Gallons in Well x 4)

Gallons Purged: 4.00 11/11/10; 10.5 11/12/10 Depth of Pump Placement: 136

Maximum Drawdown (ft BTOC): 111.98 Pump Rate (Hz): 239.4

Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
11/10 1245	1.1	0.3	111.97	5.72	398	4.1	7.52	409.0	164
1255	2.2	0.6	111.78	9.07	398	3.8	7.54	356.7	68.9
↓ 1301	3.3	0.6	111.78	11.06	395	3.7	7.55	343.8	39.6
to 1019	1.1	0.4	111.80	5.80	392	19.0	7.49	153.2	44.7
1026	2.2	0.4	111.80	7.87	392	19.8	7.49	149.1	30.2
1037	3.3	0.4	111.80	9.71	400	20.0	7.50	160.5	24.1
1048	4.4	0.4	111.80	9.89	395	17.4	7.51	162.4	16.6

SAMPLING DATA

Odor: None Color: none - Clear

Sample Designation: 10FROAWA14 Time / Date: 1154; 11/12/10

QC Sample Designation: 10FROAWA15 (MS/MSD) Time / Date: 1154; 11/12/10

Evacuation Method: ~~Grundfos~~ Submersible Pump / Other: Geotech Subm. Pump could not get to pull up water

Sampling Method: ~~Grundfos~~ Submersible Pump / Other:

Remarks: Controller for Grundfos dies ~1310 - 11/11/10

Sampling Personnel: Shayla Swedlund + Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-3534

Date: 11/12/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
10.59	5.5	0.4	111.80	10.22	0.392	10.7	7.52	159.8	10.1
1119	6.6	0.45	111.80	9.06	394	25.2	7.52	159.8	7.98
1135	7.7	0.45	111.80	11.09	395	9.5	7.52	160.3	4.36
~~1148~~ 1193	8.8	0.45	111.80	12.29	397	10.0	7.53	172.7	3.40
1150	9.9	0.45	111.80	12.29	398	10.2	7.53	171.3	3.21

Sampling Personnel: Shayla Swedlund + Ben Turner

Temp ↑ when sun out - disregarded temp in stabilization

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Job No: 32-1-17394 Location: Fort Richardson, Alaska Weather: Pt1y Cloudy ~30°F
Site: OVE Well No.: AP-4413
Date: 11/12/10 Time Started: 1219 Time Completed: 1359

WELL INSPECTION OBSERVATIONS

Pad Condition (cracked, heaved, subsided): Good
Casing Condition (bent, dented, paint condition: Good
Well Identification (labeled with well numbers): Yes
Well locking cap and lock present: Yes ☒ No ☐ Notes:

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1108 Date of Depth Measurement: 11/9/10
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2 Well Screen Interval: Unknown
Total Depth of Well Below MP: 75.30 Product Thickness, if noted: none
Depth-to-Water (DTW) Below MP: 72.49
Water Column in Well: 2.81 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 0.45 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 11/12/10 Time Started: 1230 Time Completed: ~~1359~~ 1347
Four Well Volumes: 1.8 (Gallons in Well x 4)
Gallons Purged: 0.9 gal total Depth of Pump Placement: NA
Maximum Drawdown (ft BTOC): 72.79 Pump Rate (Hz): NA
Well Purged Dry: Yes ☐ No ☒ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
12:54	0.1	NA	72.56	12.09	476	13.1	7.43	140.8	O.R.
13:00	0.1	NA	72.56	12.69	481	13.1	7.57	130.0	O.R.
13:05	0.1	NA	72.56	10.41	252	19.8	7.64	137.3	O.R.
13:09	0.1	NA	72.56	9.32	484	14.2	7.61	135.7	O.R.
13:13	0.1	NA	72.56	8.52	484	15.3	7.62	137.9	O.R.
13:16	0.1	NA	72.56	7.441	483	16.6	7.66	140.7	O.R.
13:23	0.1	NA	72.56	6.94	485	16.4	7.64	143.5	O.R.

SAMPLING DATA

Odor: none Color: Really turbid - lots of sand - Redeveloped
Sample Designation: 10FROAWA15 Time / Date: 13:31 / 11-12-10
QC Sample Designation: — Time / Date:
Evacuation Method: Grundfos Submersible Pump / Other: Disp Bailer
Sampling Method: Grundfos Submersible Pump / Other: Disp Bailer
Remarks: Tried pumping w/ my Grundfos - no water 1247
Sampling Personnel: BENJAMIN TURNER & SHAYLA SWEDLUND

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Shannon & Wilson, Inc.

WATER SAMPLING LOG

Continued from previous page

Job No: 32-1-17394 Location: Fort Richardson, Alaska Site: OUE

Well No.: AP-4413

Date: 11/12/10

Time:	Gallons:	Pump Rate (L/min):	Drawdown (ft BTOC):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
13:27	0.1	NA	72.56	6.49	484	16.95	7.71	137.0	O.R.

Sampling Personnel: Shayla Swedlund & Ben Turner

WELL CASING VOLUMES (GAL/FT): 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Appendix A2
Field Log

Ft Rich-OVE
(1) SIS

Nov 9, 2010

Equipment - 2010 - November

* Hach 2100Q Turbidimeter (S+W)
  SN 10080C004280
* YSI 556 MPS (S+W) 10G101646
* Solinist Water Level Meter - Model 101 (S+W) 26827
* Solinist ~~water level meter~~ ESS Interface Meter Model 122 (TTT) 122006551-1
* Grundfos - A1A106003 P1 0841 0013
* Grundfos Controller (TTT) Balder ~~H0603200115~~ SS
  1H0603200115
* Grundfos Controller (S+W)
* Honda Generator EV2000:
  EAAJ-1374689

** Note: Used TTT Grundfos Controller from only Nov 12, 2010
Used S+W Grundfos Controller Nov 10+11, 2010

Weather - ~25°F; Foggy
Sampling Personnel - Shayla Swedlund and Ben Turner - S+W
Field Equipment - Prod Interface Probe Grundfos/Controller, Generator, YSI 556, Turbidimeter
PPE - Steel toe boots, Safety Glasses.

Samples Collected

10FR0AWA01 - 1550 - Trip Blank
10FR0AWA02 - 1555 - AP-3468

IDW
AP-4411 - 1.4 gal
AP-4341 - 1.2 gal
AP-3468 - 1.6 gal
Decon H2O - 8 gal
} Drum OVE 01

Ft Rich-OUE
SS

Nov 9, 2010

0700 - Pick up Ben @ hotel - take him to work - begin packing truck up.

0740 - Leave work to go to AIH to pick up propane for locks, gloves; head to Garretts Tesoro to fuel up generator and fill 5-gal gas can

0850 - At Ft Rich - get pass for Ben - go through security

0918 - At well AP-3870 - set up

0930 - DTW = 101.41 ; no product

0951 - AP-3774 ; DTW = 108.66 ; no product

1002 - AP-3871 ; DTW = 112.57 ; no product

1018 - AP-4411 ; DTW = ~~88~~ 68.16 ; no product

1028 - AP-4342 ; DTW = 97.28 ; no product

1035 - AP-3468 ; DTW = 110.09 ; no product

1037 - AP-3534 ; DTW = 111.68 ; no product

1047 - AP-4341 ; DTW = 64.17 ; no product

1056 - AP-3893 ; DTW = 92.41 ; no product

1108 - AP-4413 ; DTW = 72.49 ; no product

1113 - On Well AP-4411 - purged dry after 1.4 gallons @ 1200

1208 - On Well AP-4341 - purged dry 1245

Ft Rich-OUE
SS

Nov 9, 2010

1250 - At IDW Disposal Area - 4 Available empty wells @ site

1254 - LV IDW Disp - Lock up

1258 - At Well AP-3774 could not get the water to come up - after cranking juice up to ~380 Hz + no water (prev 229 Hz) turned off and pulled up tubing - no indication of water coming up - saw kink in tubing → removed kink - tried again, starting @ 25 Hz + working up - have over voltage motor (VLM?) indicator → decided that likely issue w/ generator as Andrew Lee has problems w/ indicator and it was not a controller

1450 - off well - so to wells that can be sampled w/ bailers

(4)

FtRich-OUE
SIS

Nov 9, 2010

1505 - On Well AP-3468 - purge w/disp. bailer
1555 - Collect Sample 10FR0AWA02 from Well AP-3468
1652 - Off Well AP-3468 (Took A LONG time getting filter to filter all of Dissolved Metal Sample)
1656 - At POC Dewatering Facility
1713 - LV Dewatering Facility - leave FtRich
1800 - At S+W - demob

End Nov 9, 2010

(5)

FtRich-OUE
SIS
Nov 10, 2010

Weather - Foggy ~20°F
Sampling Personnel - Shayla Swedlund
Ben Turner - S+W
Field Equipment - DTW Instrument; Grundfos Controller, Generator, YSI 556, Turbidmeter
PPE - Steel toe boots, safety glasses

Samples Collected
~~10FR0AWA01~~
10FR0AWA03 - AP-3774; 1010
10FR0AWA04 - AP-3870; 1215
10FR0AWA05 - AP-3871; 1405
10FR0AWA06 - AP4342; 1615
10FR0AWA07 - AP-4342 (Duplicate); 1620
10FR0AWA08 - Rinsate 1805

IDW
AP-4341 - 0.8 gal
AP-3774 - 2.8 gal
AP-~~3~~4411 - 0.7 gal
AP-3870 - 4.2 gal
AP-3871 - 3.0 gal

AP-4342 - 1.5 gal
Decon H_2O - 8.0 gal

All into Drum OUE01

Nov 10, 2010

0700 - Pick up Ben - go to St Ward pack up
0745 - LV SeW for Ft Rich
0830 - At Ft Rich - go thru security
0839 - Well AP-4341 - recovered + purge dry
0851 - AP-4341 purge dry - go to Motor Pool to purge dry well AP4411 - door + gate are locked - sign says they are on break
0900 - At well AP-3774
1010 - Sample AP-3774; 10FR0AWA03
1048 - Off well AP-3774
1058 - On well AP-4411 after checking in @ Motor Pool
1100 - well AP-4411 recovered - purged dry again
1115 - Off well AP-4411
1120 - On well AP-3870
1215 - Collect Sample 10FR0AWA04 from well AP-3870
1241 - Off well AP-3870

Nov 10, 2010

1249 - On well AP-3871 - fluct. flow rate
1405 - Collect Sample 10FR0AWA05 from well AP-3871
1434 - Off well AP-3871
1439 - On well AP-3893 - Did not have enough of one length of tubing so tried to splice pieces together - cold so could not get splice to go inside tubing
1535 - Off well AP-3893 - cald not get tubing to splice together - will try tomorrow.
1539 - On well AP-4342
+5 ~ 55
1615 - Collect Sample 10FR0AWA06 and QC Sample 10FR0AWA07 from well AP-4342
1643 - Off well AP-4342 - to drop off IDW - out of filters so will collect rinsate sample @ office

(8)

Ft Rich OVE
S13

Nov 10, 2010
1650 - APOL Dewatering facility to drop off IDW
1700 - LV POL Facility, lockup - leave Ft Rich
1730 - At work - demob
End Nov 10, 2010

Ft Rich-OVE
S15

(9)

Nov 11, 2010
Weather - Pt Cloudy ~25-30°F
Sampling Personnel - Shayla Swedlund + Ben Turner - S+W
Field Equipment - DTW Instrument, Grundfos + Controller, Generator, YSI, Turbidimeter
PPE - Steel toe - safety glasses.

Samples Collected
10FROAWA09 - Trip Blank 1113
10FROAWA10 - AP-3893 - 1140
All in Cooler Ø2
10FROAWA11 - Rinsate ~~1405~~ 16:05

IDW
- AP-4341 - 0.8 gal
- AP-3893 - 11 gal
- AP-3534 - 4 gal
- Decon H_2O - 7 gal

Drum QUE 01

Ft Rich - OVE
SIS

Nov 11, 2010

0700 - Pick up Ben @ hotel - go to office + pack up, relinquish samples

0750 LV Sew go to TTT to get tubing + Home Depot for connectors for Geotek pump

0925 - At Ft Rich - go through security

0928 - At Motor Pool - nobody in there + gate is locked - drive around, most buildings do not have vehicles out front - Veteran's Day. :)

0933 - At well AP-4341 - purge dry

0946 - At well AP-3893

1140 - Collect Sample 10FROAWA10 from well AP-3893

1200 Off well AP-3893

1205 - On well AP-3534

1310 - While purging, controller drop from 239 Hz to 195 Hz - could not turn up or turn off the RPm. Turn off generator + try again, controller would not

Ft Rich - OVE
SIS

Nov 11, 2010

allow any power through - note "Output indicator light is on the generator.

1312 - Call Steve @ TTT - no suggestions that I didn't try - told him I would try the second pump and see if it is a generator or controller issue

1315 - Try Geotech pump in bucket of H_2O - works great
→ connect pump (3/8 ID) to hose (1/2 ID) w/ hose clamp and check in bucket of clean water if any leaks - all good so put down well
→ max out pump @ 200 (units?) but no water (started @ 80 and worked up to 200) - no water - figured not enough power to push water up given the extra hose diameter -

Nov 11, 2010

1422- No other options so go to drop off IDW.

1440±V Pol Dewatering Facility - lock up - LV Ft Rich

1530- At TT - got new controller talked to Steve about old controller issues.

1600- At S+W - talk to Stafford + Hayden about issues + equipment - begin demob

1605- Collect Rinsate Sample 10FROAWA11

End Nov 11, 2010

Nov 12, 2010

Weather - PHyCloudy ~30°F

Sampling Personnel - Shayla Swedlund + Ben Turner

Field Equipment - DTW Instrument, Grundfos/Controller, Generator, YSI, Turbidimeter

PPE - steel toe boots, Safety Glasses

Samples Collected

10FROAWA12 - Trip Blank 0800

10FROAWA13 - ~~AP~~-4341 - 0838

10FROAWA14 - AP-3534 - 1154
MS/MSD collected from AP-3534

10FROAWA15 - ~~AP~~-4413; 1331

10FROAWA16 - AP-4411; 1405

No Rinsate Sample - pump stopped working before

Cooler Ø3

IDW

- AP-4341 - 0.2 gal
- AP-3534 - 10.5 gal
- AP-4413 - 0.9 gal
- AP-4411 - 1.1 gal
- Decon H_2O - 7 gal

] Drum# OUE #Ø2

Ft Rich-OVE
SIS

NOV 12, 2010

0700 - Mob
0730 - LV SEW for Ft Rich
0815 - At Ft Rich go thru security search
0825 - At well AP-4411 - gates are locked + nobody to/de office
0830 - At Well AP-4341
0838 - Collect Sample 10FROAWA13 from Well AP-4341
0848 - Off well AP-4341 - go to Motor Pool - they will be closed @ 230 today + not open Sat or Sunday.
0915 - At Gate - pick up TB from Dan AP-
0929 - At Well 4411 - recovered -
0938 purge dom well AP-4411
0946 - Off Well AP-4411
0947 - On Well AP-3534
1040 - Dave Britch, AECOM, stops by to let us know about area of spare drums for IDW Contact info: 748-9045
1154 - Collect Sample 10FROAWA14 from Well AP-3534

Ft Rich-OVE
SIS

NOV 12, 2010

1216 - Off Well AP-3534
1219 - On well AP-4413 - Set up well w/ Grundfos - began purging @ 1230. Previously well purged @ 259-269 Hz. Set pump @ 71' - dropped pump to bottom + pulled up a little over 1 ft to make sure its in H_2O column but not on bottom.
1247 - Ramped rate up to 300 Hz + still no water - pulled pump up to check for kinks and make sure the pump was wet (in the water) - pump was wet (muddy water) and no kinks - tried again + no H_2O. pulled up pump + it was warm. put in decon water + would not work - began purging Burned out?

Nov 12, 2010

noisy bailer-(micro)
High sediment load on purge-water. Let H2O settle in cup - nearly 1/2 was settled-out SAND. May need to be re-developed
-had problems getting bailer to not jam up & filter to flow due to high sed.

1331- Collect Sample 10FRQAWA15 from well AP-4413
Very turbid

1359- Off Well AP-4413

* Note all wells have the tubing tied inside, w/ the exception of the wells that purged dry or bailed (AP-4413 ~~did~~ we did) leave tubing in just in case)

1401- On Well AP-44H - recovered 50 collected Sample. Note- gates in Motor Pool Closed @ 1430.

Nov 12, 2010

1405- Collect Sample 10FRQAWA16 from Well AP-4411
Note- no rinsate sample was collected because pump discontinued working.

1421- OFF Well AP-4411 start DTW measurements @ From Bldg 762 Site

1620- At POL Dewatering Facility to Drop off IDW

1637- Leave Ft Rich- Lockup POL Dewatering Facility.

1710- At SEW - Demob - overhaul pump to check if we burned out motor.

1524- Go to gate to drop off Samples w/ Dan McMahon of SEW to get to lab

1626- Get call from Hayden ~~SS~~ I do not have ~~the~~ Blank temp in cooler — look in truck, but can't find.

End NOV 12, 2010

Appendix B
Chemical Data Quality Review

Appendix B1
Data Quality Evaluation Report

JBER-Richardson Operable Unit E Groundwater Monitoring Fall 2010 Chemical Data Quality Review

Introduction

This chemical data quality review (CDQR) assesses the quality of analytical results for water samples collected as part of ongoing groundwater monitoring at Operable Unit E (OUE; Armored Vehicle Maintenance Area), Joint Base Elmendorf-Richardson (JBER)-Richardson, Alaska. We generally used data quality objectives (DQOs) and criteria presented in CH2M HILL's November 2002 Quality Assurance Program Plan (QAPP) as well as internal laboratory quality-control limits for this assessment. Per our January 2011 conversations with the USACE, laboratory data were evaluated using the detection limit reporting requirements outlined in the 2009 U.S. Department of Defense (DOD) Quality Systems Manual (QSM) for Environmental Laboratories, Final Version 4.1. Reported laboratory analytical detection limits were compared to groundwater-cleanup standards listed in the 2008 version of 18 AAC 75 ADEC Table C. This report presents a summary of data-quality issues and anomalies identified in our review that may affect the use of the results for ongoing groundwater monitoring.

Analytical Results

We collected a total of 10 project samples and one field-duplicate sample from 10 wells within the site. We also collected two equipment-blank samples (EB) for the OUE site, and delivered a trip-blank sample (TB) with each cooler containing samples for analysis of volatile organic compounds (VOCs). We hand-delivered the samples to the SGS Environmental Services, Inc. (SGS) Anchorage laboratory in three coolers under three sample delivery groups (SDGs): SGS work orders 1106137, 1106161, and 1106170. The samples were analyzed for the analytes listed in Table 1 by the methods shown:

Table 1
OUE Groundwater Analyses

Parameter	Method	Laboratory
Volatile Organic Compounds (VOC)	SW8260B	SGS Anchorage
Dissolved metals (aluminum, arsenic, iron, manganese)	SW6020	SGS Anchorage
Nitrite, nitrate, and sulfate	SW9056A	SGS Anchorage
Dissolved methane	RSK 175	Columbia Analytical Services, Simi Valley, California

SGS transferred samples for methane analysis to Columbia Analytical Service (CAS) in Simi Valley, California by overnight carrier.

As part of this CDQR, we reviewed: (1) sample-handling information, including chain-of-custody (COC) documentation, holding-time compliance, and sample-receipt forms; (2) calibration information presented in the laboratory case narratives; (3) analytical sensitivity, including comparison of detection limits (DLs), limits of detection (LODs), and limits of

quantitation (LOQs) to ADEC groundwater-cleanup levels listed in 18 AAC 75 Table C, and examination of field blank and method blank results; (4) accuracy, as assessed by laboratory control sample (LCS) and LCS duplicate (LCSD), matrix spike (MS) and MS duplicate (MSD), and surrogate recoveries; and (5) precision, as assessed by relative percent difference between LCS/LCSD, MS/MSD, and project sample/field duplicate (FD) results. To assure that some of the MS-recovery assessments were conducted on samples from our project, we submitted project samples for this purpose; they are referred to as "Billable Matrix Spikes" (BMS) or BMS duplicates (BMSDs).

We validated analytical results, when affected by data-quality issues identified above, with data flags defined in the QAPP.

The data flags used are defined below:

- J = Analyte was present but the reported value may not be accurate or precise (estimated).
- J+ = Analyte was present but the reported value may not be accurate or precise (biased high).
- J- = Analyte was present but the reported value may not be accurate or precise (biased low).
- R = The result was rejected as unusable due to analytical deficiencies.
- U = Analyte was not detected at the specified reporting limit.
- UJ = Analyte was not detected and the specified reporting limit may not be accurate or precise (estimated), or analyte was not detected and sample handling or QC failures may have resulted in a low bias (and thus the non-detect result).

Findings

We present a summary of our data-quality review below. We included the Alaska Department of Environmental Conservation laboratory data-review checklists for the SDGs in Appendix B3.

Sample Handling

We reviewed the sample-receipt form and COC documentation as we received it from SGS. Holding-time compliance was assessed upon receipt of the Level II laboratory reports.

Sample Condition

Temperature blank and cooler temperatures were within the acceptable range (2 °C to 6 °C).

Chain of Custody

We did not place COC seals on coolers we hand-delivered to the Anchorage SGS laboratory, since samples were in our custody until delivery. COC seals were present and intact on coolers containing methane samples upon receipt at CAS. Custody was not breached during sample handling and COC forms were properly completed.

Holding Times

Holding-time criteria were met for most samples/analyses. However, sample *10FROAWA-02* in SDG 1106137 was analyzed for nitrate and nitrite by Method 9056A outside of holding time (75 minutes) because of an instrument error. Therefore, the nitrate concentration in sample *10FROAWA-02* is flagged (J-) as an estimated concentration that may be biased low. Nitrite was not detected in sample *10FROAWA-02*, and is therefore flagged (UJ) as not detected and the holding time exceedance may have resulted in a low bias (and thus the non-detect result).

Calibration

We reviewed the case narrative notes regarding calibration failures. There were several analytes that were recovered above QC limits in the continuing calibration verification (CCV). Since most of these analytes were not detected in project samples above the LOQ, the CCV recoveries should not affect the data quality/usability.

In SDG 1106170, however, 1,1,1,2-tetrachloroethane and carbon tetrachloride were recovered above QC limits - in the CCV, and these analytes were also detected in project samples *10FROAWA-13* and *10FROAWA-15*. Therefore, carbon tetrachloride concentrations in samples *10FROAWA-13* and *10FROAWA-15*, and 1,1,1,2-tetrachloroethane in *10FROAWA-15* are flagged (J+) as estimated concentrations that may be biased high.

Analytical Sensitivity

DLs, LODs, and LOQs were compared to groundwater-cleanup standards listed in 2008 18 AAC 75 ADEC Table C, and blank samples were checked to determine if water samples were contaminated from laboratory practices, cross-contamination from other samples, or sampling equipment.

Limits of Quantitation

Two analytes, 1,2-dibromoethane and 1,2,3-trichloropropane, had DLs, LODs, and LOQs above the ADEC groundwater-cleanup level, as shown in validated analytical results table in Appendix B2. The project laboratory is unable to provide detection limit values below the cleanup level for these analytes with their current analytical methods.

Method Blanks

Method blanks (MBs) were analyzed for every preparation/analysis batch. MB results were below DLs, LODs, and LOQs.

Field Blanks

Trip blanks were transported in coolers containing VOC samples, and equipment blanks (EBs) were collected at the required frequency (one per area per day). The trip blanks for VOC results were below DLs, LODs, and LOQs with the following exceptions.

Estimated concentrations of chloroform (0.560 J µg/L) and sulfate (57.0 J µg/L) were detected between the DL and the LOQ in equipment blank *EBOUE01* in SDG 1106137. Since sulfate was detected in project samples at concentrations greater than five times the equipment blank concentration, the sulfate data quality in associated project samples should not be affected. Since chloroform was detected in sample *10FROAWA-05* at a concentration greater than five times the equipment blank concentration, the chloroform concentration in this project sample should not be affected. Chloroform was detected in project sample *10FROAWA-02* at an

estimated concentration between the DL and the LOQ; therefore the sample is flagged (UJ) as not detected at the LOQ due to a QC failure resulting in a low bias. Chloroform was detected in project samples *10FROAWA-06* and *10FROAWA-07* at concentrations above the LOQ but less than five times the equipment blank concentration; therefore the associated samples are flagged (U) as not detected at the sample concentrations.

Estimated concentrations of chloroform (0.610 J µg/L) and methane (1.3 µg/L) were detected between the DL and LOQ in equipment blank *EBOUE02* in SDG 1106161. Since chloroform was not detected in the associated project samples above the LOQ, the data quality/usability should not be affected by the chloroform detection in this equipment blank. Since methane was detected in sample *10FROAWA-10* at an estimated concentration between the DL and the LOQ, the sample is flagged (U) as not detected at the LOQ.

Accuracy

We reviewed the analyte-recovery information for QC samples and surrogate spikes to assess the accuracy of the analyses. An LCS/LCSD and BMS/BMSD were reported for VOCs; an LCS and MS/MSD and/or BMS/BMSD were reported for dissolved metals; an LCS and MS/MSD and/or BMS/BMSD were reported for nitrate, nitrite, and sulfate; and an LCS/LCSD and MS/MSD was reported for methane.

Laboratory Control Samples

LCS and LCSD analyte recoveries were within the laboratory control limits for most analytes. However, several VOC analytes were recovered above QC limits (biased high) in the LCS/LCSD. Most of these analytes were not detected in the associated project samples, so the data quality/usability should not be affected by these high LCS/LCSD recoveries, with the following exception.

In SDG 1106170, 1,1,1,2-tetrachloroethane and carbon tetrachloride were recovered above QC limits in the LCS/LCSD, and estimated concentrations of one or both these analytes were detected in samples *10FROAWA-13* and *10FROAWA-15* between the DL and LOQ. Therefore, the concentrations carbon tetrachloride detected in samples *10FROAWA-13* and *10FROAWA-15* and 1,1,1,2-tetrachloroethane in sample *10FROAWA-15* are flagged (J+) as estimated concentrations that may be biased high.

Matrix Spike Samples

Matrix spike samples provide information about the laboratory's ability to recover analytes from the actual sample matrix, thus providing a measure of matrix effects. We designated sample *10FROAWA-14* for MS/MSD analysis (the project, or billable, MS/MSD [BMS/BMSD]). Multiple analytes were recovered outside QC limits in the BMS/BMSD. Most of these analytes were not detected in the associated project sample, so the data quality/usability should not be affected by these recoveries, with the following exception.

In SDG 1106170, sulfate was recovered below QC limits in the MS/MSD samples, but was recovered within limits for the BMS/BMSD samples (sample *10FROAWA-14*). The LCS and duplicate-sample recoveries were also within control limits. Therefore the sulfate concentration in sample *10FROAWA-14* was not flagged as being biased low.

The laboratory also analyzed internal MS/MSDs, spiking other project samples, and in some cases reported MS/MSDs of spiked non-project samples (other clients' samples in the same analytical batch; a stand-in MS/MSD). Most of the analytes were recovered within QC limits in the MS/MSD samples with the following exception.

MSD recovery of sulfate in SDG 1106137 was outside QC limits in stand-in MS/MSDs; the originals were not in our sample set, so our project results were unaffected. MS/MSD recoveries of sulfate, fluoride, and nitrite also were outside QC limits in SDG 1106161. Nitrite was recovered above the control limit, and sulfate was recovered below the control limit; the project samples were not analyzed for fluoride. Nitrite was not detected above the LOQ in the associated samples. The nitrite and sulfate recoveries outside QC limits in the MS/MSD sample should not affect the project samples, since the LCS recoveries for these analytes are within QC range and the sample selected as the MS/MSD was not collected from the project site.

Surrogates

The SGS laboratory spiked the project and QC samples with surrogates. Surrogate recoveries provided by SGS were within laboratory control limits.

Precision

We assessed precision by calculating relative percent difference (RPD; the difference between the duplicate sample results divided by the mean of the two) for LCS/LCSD, MS/MSD, and project-sample/field-duplicate pairs. LCS/LCSD RPDs were within laboratory control limits, with the exception of chloroethane. The reported RPD for the LCS/LCSD for chloroethane in SGD 1106170 was above laboratory control limits. However, chloroethane was not detected in associated project samples, so the project data should not be affected. MS/MSD RPDs were also within laboratory control limits.

The field duplicate pair for the site was *10FROAWA-06/10FROAWA-07*. Most analytes were not detected in each of the sample/duplicate pair, so RPDs could not be calculated. Analytes that were detected in each of the samples had RPDs within control limits as outlined in CH2M HILL's 2002 QAPP.

Overall Assessment

To conclude our data review, we evaluated whether the quality of the analytical results was sufficient for the purposes of the project and whether data completeness goals were achieved.

No data were rejected as unusable, and completeness objectives were met. The data are accurate, precise, and representative, as qualified by the following data flags resulting from the QC anomalies described above.

We summarize the key findings of our data quality review below:

1. The nitrate and nitrite concentrations in sample *10FROAWA-02* may be biased low due as a result of the holding time exceedance, and were therefore flagged (J- and UJ, respectively) as estimated concentrations that may be biased low.
2. The chloroform concentrations in samples *10FROAWA-02*, *10FROAWA-06*, and *10FROAWA-07* may be elevated due to contamination from sampling equipment, as

indicated in the associated equipment rinsate, *EBOUE01*. Chloroform was detected in sample *10FROAWA-02* at an estimated concentration between the DL and the LOQ; therefore the sample is flagged (UJ) as not detected at the LOQ due to a QC failure resulting in a low bias. Chloroform was detected in project samples *10FROAWA-06* and *10FROAWA-07* at concentrations above the LOQ but less than five times the equipment blank concentration; therefore the associated samples are flagged (U) as not detected at the sample concentrations.

3. The methane concentration in sample *10FROAWA-10* may be elevated due to contamination from sampling equipment, as indicated in the associated equipment rinsate, *EBOUE02*; therefore sample *10FROAWA-10* was flagged (U) as not detected at the LOQ.
4. The carbon tetrachloride concentrations in samples *10FROAWA-13* and *10FROAWA-15*, and the 1,1,1,2-tetrachloroethane concentration in sample *10FROAWA-15* may be biased high due to high CCV and LCS/LCSD recoveries. They were therefore flagged (J+) as estimated concentrations that may be biased high.

In general, the precision and accuracy of the data met the goals specified in the QAPP, and the data are of sufficient quality for the purposes of this project.

Table 2
Validation Flags

Sample ID	Method	Analyte	Final Result	LOD	LOQ	Units	Final Flag	Reason
10FROAWA-02	SW9056A	Nitrate-N	2320	62.0	100	µg/L	J-	HT
10FROAWA-02	SW9056A	Nitrite-N	<62.0	62.0	100	µg/L	UJ	HT
10FROAWA-02	SW8260B	Chloroform	<1.00	0.600	1.00	µg/L	UJ	EB Det.
10FROAWA-06	SW8260B	Chloroform	<1.44	0.600	1.00	µg/L	U	EB Det.
10FROAWA-07	SW8260B	Chloroform	<1.41	0.600	1.00	µg/L	U	EB Det.
10FROAWA-10	RSK 175	Methane	<1.3	0.60	1.3	µg/L	U	EB Det.
10FROAWA-13	SW8260B	Carbon tetrachloride	0.540	0.620	1.00	µg/L	J+	High CCV, LCS/LCSD
10FROAWA-15	SW8260B	1,1,1,2-Tetrachloroethane	0.240	0.300	0.50	µg/L	J+	High CCV, LCS/LCSD
10FROAWA-15	SW8260B	Carbon tetrachloride	0.990	0.620	1.00	µg/L	J+	High CCV, LCS/LCSD

Notes:

EB Det.	analyte was detected in the equipment blank (EB), and the sample concentration was less than 5-times the EB concentration
High CCV	this analyte was recovered above QC limits in the continuing calibration verification sample (CCV)
High LCS/LCSD	this analyte was recovered above QC limits in the laboratory control spike (LCS) and laboratory control spike duplicate (LCSD)
HT	the holding time (HT) was exceeded for this analyte
J	analyte was present but the reported value may not be accurate or precise (estimated)
J+	analyte was present but the reported value may not be accurate or precise (biased high)
J-	analyte was present but the reported value may not be accurate or precise (biased low)
LOD	limit of detection
LOQ	limit of quantitation
µg/L	micrograms per liter
U	analyte was not detected at the specified reporting limit.
UJ	analyte was not detected and specified reporting limit may not be accurate or precise (estimated)

Appendix B2
Validated Analytical Results

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3486	PS	9-Nov-10	10FROAWA-02	RSK175	Methane	-	<1.3		1.3	-	0.30	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW6020	Iron	-	<620		1000	620	310	ug/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW6020	Manganese	-	3.09		2.00	1.24	0.620	ug/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Bromomethane	51	<1.88		3.00	1.880	0.940	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Carbon tetrachloride	5	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Chloroform	140	<1.00	UJ	1.00	0.600	0.300	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Tetrachloroethene	5	54.3		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	µg/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW9056A	Nitrate-N	-	2320	J-	100	62.0	31.0	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW9056A	Nitrite-N	-	<62.0	UJ	100	62.0	31.0	µg/L
AP3468	PS	9-Nov-10	10FROAWA-02	SW9056A	Sulfate	-	22500		100	62.0	31.0	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	RSK175	Methane	-	<1.3		1.3	-	0.30	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW6020	Aluminum	-	<300		500	300	150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW6020	Iron	-	<620		1000	620	310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW6020	Manganese	-	4.60		2.00	1.24	0.620	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Carbon tetrachloride	5	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Chloroform	140	<0.600		1.00	0.600	0.300	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	µg/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Tetrachloroethene	5	0.520	J	1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW9056A	Nitrate-N	-	1010		100	62.0	31.0	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	µg/L
AP3774	PS	10-Nov-10	10FROAWA-03	SW9056A	Sulfate	-	25300		100	62.0	31.0	µg/L
AP3870	PS	10-Nov-10	10FROAWA-04	RSK175	Methane	-	<1.3		1.3	-	0.30	µg/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW6020	Iron	-	<620		1000	620	310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW6020	Manganese	-	1.49	J	2.00	1.24	0.620	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Carbon tetrachloride	5	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Chloroform	140	<0.600		1.00	0.600	0.300	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Tetrachloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.880	0.940	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW9056A	Nitrate-N	-	968		100	62.0	31.0	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP3870	PS	10-Nov-10	10FROAWA-04	SW9056A	Sulfate	-	25700		100	62.0	31.0	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	RSK175	Methane	-	0.39		1.3	-	0.30	µg/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW6020	Arsenic	10	<3.00		5	3.00	1.5	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW6020	Iron	-	<620		1000	620	310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW6020	Manganese	-	11.8		2.00	1.24	0.62	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	2-Hexanone	-	<6.20		10.0	6.200	3.10	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Bromodichloromethane	14	0.330	J	0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Carbon tetrachloride	5	0.360	J	1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Chloroform	140	5.77		1.00	0.600	0.300	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Tetrachloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW9056A	Nitrate-N	-	1340		100	62.0	31.0	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP3871	PS	10-Nov-10	10FROAWA-05	SW9056A	Sulfate	-	24800		100	62.0	31.0	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	RSK175	Methane	-	0.51		1.3	-	0.30	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW6020	Aluminum	-	2680		500	300	150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW6020	Iron	-	3150		1000	620	310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW6020	Manganese	-	67.5		2.00	1.24	0.620	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2-Dichloroethane	5	<0.300		0.50	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Carbon tetrachloride	5	0.960	J	1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Chloroform	140	<1.44	U	1.00	0.600	0.300	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Tetrachloroethene	5	53.2		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW9056A	Nitrate-N	-	2220		100	62.0	31.0	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP4342	PS	10-Nov-10	10FROAWA-06	SW9056A	Sulfate	-	25500		100	62.0	31.0	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	RSK175	Methane	-	0.54		1.3	-	0.30	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW6020	Aluminum	-	2990		500	300	150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW6020	Iron	-	3570		1000	620	310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW6020	Manganese	-	74.8		2.00	1.24	0.620	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Carbon tetrachloride	5	0.920	J	1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Chloroform	140	<1.41	U	1.00	0.600	0.300	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Tetrachloroethene	5	52.1		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW9056A	Nitrate-N	-	2350		100	62.0	31.0	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP4342	FD	10-Nov-10	10FROAWA-07	SW9056A	Sulfate	-	25000		100	62.0	31.0	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	RSK175	Methane	-	<1.3	U	1.3	-	0.30	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW6020	Arsenic	10	24.4		5.00	3.00	1.50	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW6020	Iron	-	<620		1000	620	310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW6020	Manganese	-	45.2		2.00	1.24	0.620	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.50	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	2-Butanone (MEK)	22000	<6.20		10.00	6.20	3.10	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Carbon tetrachloride	5	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Chloroform	140	<0.600		1.00	0.600	0.300	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Chloromethane	-	0.400	J	1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.31	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Tetrachloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW9056A	Nitrate-N	-	<62.0		100	62.0	31.0	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP3893	PS	11-Nov-10	10FROAWA-10	SW9056A	Sulfate	-	19100		100	62.0	31.0	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	RSK175	Methane	-	<1.30		1.3	-	0.30	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW6020	Iron	-	<620		1000	620	310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW6020	Manganese	-	<1.24		2.00	1.24	0.620	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Carbon tetrachloride	5	0.540	J+	1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Chloroform	140	0.620	J	1.00	0.600	0.300	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Tetrachloroethene	5	7.67		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW9056A	Nitrate-N	-	1060		100	62.0	31.0	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP4341	PS	12-Nov-10	10FROAWA-13	SW9056A	Sulfate	-	16400		100	62.0	31.0	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	RSK175	Methane	-	<1.30	J	1.3	-	0.30	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW6020	Iron	-	<620		1000	620	310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW6020	Manganese	-	0.661	J	2.00	1.24	0.620	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Carbon tetrachloride	5	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Chloroform	140	<0.600		1.00	0.600	0.300	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Tetrachloroethene	5	23.1		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW9056A	Nitrate-N	-	1370		100	62.0	31.0	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP3534	PS	12-Nov-10	10FROAWA-14	SW9056A	Sulfate	-	25700		100	62.0	31.0	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	RSK175	Methane	-	0.62		1.3	-	0.30	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW6020	Aluminum	-	<300		500	300	150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW6020	Arsenic	10	<3.00		5.00	3.00	1.50	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW6020	Iron	-	<620		1000	620	310	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP4413	PS	12-Nov-10	10FROAWA-15	SW6020	Manganese	-	3.60		2.00	1.24	0.620	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1,1,2-Tetrachloroethane	-	0.240	J+	0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Benzene	5	0.520		0.400	0.240	0.120	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Carbon tetrachloride	5	0.990	J+	1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Chloroform	140	1.91		1.00	0.600	0.300	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Chloromethane	-	0.430	J	1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Tetrachloroethene	5	88.8		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Toluene	1000	0.380	J	1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP4413	PS	12-Nov-10	10FROAWA-15	SW9056A	Nitrate-N	-	2730		100	62.0	31.0	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP4413	PS	12-Nov-10	10FROAWA-15	SW9056A	Sulfate	-	25800		100	62.0	31.0	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	RSK175	Methane	-	0.57	J	1.3	-	0.30	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW6020	Aluminum	-	4170		500	300	150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW6020	Arsenic	10	1.62	J	5.00	3.00	1.50	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW6020	Iron	-	5260		1000	620	310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW6020	Manganese	-	128		2.00	1.24	0.620	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1,1,2-Tetrachloroethane	-	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1,1-Trichloroethane	200	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1,2,2-Tetrachloroethane	4.3	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1,2-Trichloroethane	5	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1-Dichloroethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1-Dichloroethene	7	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,1-Dichloropropene	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2,3-Trichlorobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2,3-Trichloropropane	0.12	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2,4-Trichlorobenzene	70	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2,4-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2-Dibromo-3-chloropropane	-	<1.24		2.00	1.24	0.620	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2-Dibromoethane	0.05	<0.620		**1.00**	**0.620**	**0.310**	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2-Dichlorobenzene	600	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2-Dichloroethane	5	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,2-Dichloropropane	5	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,3,5-Trimethylbenzene	1800	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,3-Dichlorobenzene	3300	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,3-Dichloropropane	-	<0.240		0.400	0.240	0.120	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	1,4-Dichlorobenzene	75	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	2,2-Dichloropropane	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	2-Butanone (MEK)	22000	<6.20		10.0	6.20	3.10	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	2-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	2-Hexanone	-	<6.20		10.0	6.20	3.10	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	4-Chlorotoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	4-Isopropyltoluene	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	4-Methyl-2-pentanone (MIBK)	2900	<6.20		10.0	6.20	3.10	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Acetone	33	<6.20		10.0	6.20	3.10	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Benzene	5	<0.240		0.400	0.240	0.120	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Bromobenzene	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Bromochloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Bromodichloromethane	14	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Bromoform	110	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Bromomethane	51	<1.88		3.00	1.88	0.940	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Carbon disulfide	3700	<1.24		2.00	1.24	0.620	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Carbon tetrachloride	5	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Chlorobenzene	100	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Chloroethane	290	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Chloroform	140	<0.600		1.00	0.600	0.300	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Chloromethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	cis-1,2-Dichloroethene	70	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	cis-1,3-Dichloropropene	8.5	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Dibromochloromethane	10	<0.300		0.500	0.300	0.150	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Dibromomethane	-	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Dichlorodifluoromethane	7300	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Ethylbenzene	700	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Hexachlorobutadiene	7.3	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Isopropylbenzene (Cumene)	3700	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Methylene chloride	5	<2.00		5.00	2.00	1.00	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Methyl-t-butyl ether	470	<3.00		5.00	3.00	1.50	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Naphthalene	730	<1.24		2.00	1.24	0.620	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	n-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	n-Propylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	o-Xylene	10000 [(a)]	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	P & M -Xylene	10000 [(a)]	<1.24		2.00	1.24	0.620	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	sec-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Styrene	100	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	tert-Butylbenzene	370	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Tetrachloroethene	5	10.5		1.00	0.620	0.310	ug/L

Location	Sample Type	Sample Date	Sample ID	Method	Analyte	ADEC Cleanup Level	Final Result	Final Validation Flag	LOQ / MRL	LOD	DL / MDL	Units
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Toluene	1000	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	trans-1,2-Dichloroethene	100	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	trans-1,3-Dichloropropene	8.5	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Trichloroethene	5	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Trichlorofluoromethane	11000	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Vinyl chloride	2	<0.620		1.00	0.620	0.310	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW8260B	Xylenes (total)	10000	<1.88		3.00	1.88	0.940	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW9056A	Nitrate-N	-	1620		100	62.0	31.0	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW9056A	Nitrite-N	-	<62.0		100	62.0	31.0	ug/L
AP4411	PS	12-Nov-10	10FROAWA-16	SW9056A	Sulfate	-	16900		100	62.0	31.0	ug/L

Notes:

1.00 Bold and underline values indicate DL, LOD, or LOQ values that exceed groundwater cleanup standards listed in 2008 18 AAC 75 ADEC Table C

FD field duplicate

J+ analyte was present but the reported value may not be accurate or precise (biased high)

J- analyte was present but the reported value may not be accurate or precise (biased low)

J analyte was present but the reported value may not be accurate or precise (estimated)

LOD limit of detection

LOQ limit of quantitation

MDL method detection limit

MRL method reporting limit

µg/L micrograms per liter

mg/L milligrams per liter

ND analyte not detected above LOQ

PS project sample

U analyte was not detected at the specified reporting limit.

UJ analyte was not detected and specified reporting limit may not be accurate or precise (estimated)

(a) ADEC cleanup level for xylenes is based on total xylenes

Appendix B3
ADEC Laboratory Data Review Checklists

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: JBER-Richardson – Operable Unit E **Date:** January 2012

Laboratory Report Date: December 20, 2010

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Jessica Morris
Title: Environmental Engineer

Laboratory Name: SGS North America, Inc.
Work Order Number: 1106137

ADEC File Number: 2102.38.005
ADEC RecKey Number:
(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes / No / NA (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
Comments: *Samples were shipped to Columbia Analytical Services (CAS) in Simi Valley, California for analysis of ethane, ethene, and methane by method RSK 175. ADEC certification is not required for RSK 175. However, CAS is certified for RSK 175 under the United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP).*

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (Please explain.)
Comments**:**

b. Correct analyses requested? **Yes / No / *NA* (Please explain.)**
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (Please explain.)
Comments:

b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes / No / NA (Please explain.)**
Comments:

c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes / No / NA (Please explain.)**
Comments:

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments:

e. Data quality or usability affected? **(Please Explain.)** ***NA***
Comments:

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments: *Sample 10FROAWA02 was analyzed for anions by Method 9056A outside of holding time (75 minutes) due to instrument error.*

The MSD recovery for sulfate (87%) is outside of QC criteria.

LCS/LCSD recoveries for 2-butanone and bromoform do not meet QC criteria (biased high); these analytes were not detected above the LOQ in the associated samples. LCSD recoveries for dibromochloromethane do not meet QC criteria (biased high); these analytes were not detected above the LOQ in the associated samples.

CCV recoveries for 2-butanone, bromoform, and 2-hexanone do not meet QC criteria (biased high); these analytes were not detected above the LOQ in the associated samples.

c. Were corrective actions documented? **Yes / No / NA (Please explain.)**
Comments: *No corrective actions were noted.*

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The high CCV recoveries for 2-butanone, bromoform, and 2-hexanone should not affect the data quality/usability, since these analytes were not detected above*

the LOQ in the associated samples. The effect of the rest of the discrepancies described in the case narrative on the data quality/usability is further described in other sections of this checklist.

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA (Please explain.)**
Comments:

b. All applicable holding times met? **Yes / No / NA (Please explain.)**
Comments: *Sample 10FROAWA02 was analyzed for nitrate and nitrite by Method 9056A outside of holding time (75 minutes) due to instrument error.*

c. All soils reported on a dry-weight basis? **Yes / No / NA (Please explain.)**
Comments: *Samples submitted were groundwater samples.*

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA (Please explain.)**
Comments:
Certain analytes have DLs, LODs, or LOQs greater than the Cleanup Level, as indicated in the validated analytical data tables.

e. Data quality or usability affected? **(Please explain.)**
Comments:
Nitrate and nitrite concentrations in sample 10FROAWA-02 are flagged (J- and UJ, respectively) as estimated concentrations that may be biased low, since the analysis was performed outside of holding time.

The presence of an undetected analyte above the cleanup level cannot be confirmed when the DL, LOD, or LOQ is above the cleanup level. Analytes with DLs, LODs, or LOQs greater than the Cleanup Level are indicated in the validated analytical tables.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

iii. If above PQL, what samples are affected? ***NA***

Comments:

iv. Do the affected sample(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

v. Data quality or usability affected? **(Please explain.)** ***NA***
Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846) **Yes / No / *NA* (Please explain.)**
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

LCS/LCSD recoveries for 2-butanone and bromoform do not meet QC criteria (biased high); these analytes were not detected above the LOQ in the associated samples. LCSD recoveries for dibromochloromethane do not met QC criteria (biased high); these analytes were not detected above the LOQ in the associated samples.

The MS/MSD recovery for sulfate (87%) is outside of QC criteria (biased low).

iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments: *LCS only for methods 6020 and 9056. MS/MSD used for RPD.*

v. If %R or RPD is outside of acceptable limits, what samples are affected? ***NA***
Comments:

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

vii. Data quality or usability affected? Explain. ***NA***
Comments: *The data quality/usability should not be affected by the high LCS/LCSD recoveries for 2-butanone, bromoform, and dibromochloromethane, since these analytes were not detected in the project samples. The low sulfate recovery for the MS/MSD recovery sample should not affect the project samples, since the LCS recovery for sulfate was within QC range, and the sample selected as the MS/MSD was not collected from the project site.*

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? **Yes / No / NA (Please explain.)**
Comments: *Surrogate recoveries were not reported for Method RSK 175, but are not used in this method.*

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes / No / NA (Please explain.)**
Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain. ***NA***
Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.) Water and Soil

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)**
Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**

iii. All results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

iv. If above PQL, what samples are affected? ***NA***
Comments**:**

v. Data quality or usability affected? Explain. ***NA***
Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA (Please explain.)
Comments*: Field duplicates for this site were 10FROAWA-06/10FROAWA-07*.

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs?
(Recommended: 30% for water, 50% for soil) **Yes / No / NA (Please explain.)**
Comments:

iv. Data quality or usability affected? Explain. ***NA***
Comments:

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
Yes / No / NA (Please explain.)

i. All results less than PQL? **Yes / No / NA (Please explain.)**
Comments: *Chloroform and sulfate were detected at estimated concentrations between the DL and the LOQ in equipment blank EBOUE01.*

ii. If results are above PQL, what samples are affected? ***NA***
Comments: *See section 6.f.iii, below.*

iii. Data quality or usability affected? Explain. ***NA***
Comments: *Since sulfate was detected in project samples at concentrations greater than five times the equipment blank concentration, the sulfate data quality in associated project samples should not be affected. Since chloroform was detected in sample 10FROAWA05 at a concentration greater than five times the equipment blank concentration, the chloroform data quality associated with this project sample should not be affected. Since chloroform was detected in project sample 10FROAWA-02 at an estimated concentration between the DL and the LOQ, the sample is flagged (U) as not detected at the LOQ. Since chloroform was detected in project samples 10FROAWA-06 and 10FROAWA-07at concentrations above the LOQ but less than five times the equipment blank concentration, the associated samples are flagged (U) as not detected at the sample concentrations.*

Work Order Number: _1106137__

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-specific, etc.)

a. Are they defined and appropriate? **Yes / No / NA**
Comments:

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: JBER-Richardson – Operable Unit E **Date:** January 2012

Laboratory Report Date: December 17, 2010

Consultant Firm: Shannon & Wilson, Inc.
Completed by: Jessica Morris
Title: Environmental Engineer

Laboratory Name: SGS North America, Inc.
Work Order Number: 1106161

ADEC File Number: 2102.38.005
ADEC RecKey Number:
(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes / No / NA (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
Comments: *Samples were shipped to Columbia Analytical Services (CAS) in Simi Valley, California for analysis of ethane, ethene, and methane by method RSK 175. ADEC certification is not required for RSK 175. However, CAS is certified for RSK 175 under the United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP).*

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (Please explain.)
Comments**:**

b. Correct analyses requested? **Yes / No / *NA* (Please explain.)**
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (Please explain.)
Comments:

b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes / No / NA (Please explain.)**
Comments:

c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes / No / NA (Please explain.)**
Comments:

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments:

e. Data quality or usability affected? **(Please Explain.)** ***NA***
Comments:

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments: *Multiple analytes were recovered outside of QC limits in the LCS/LCSD, MS/MSD, and CCV. The CCV, LCS, and LCSD recoveries were above the laboratory control limits, and many of the corresponding analytes were not detected above the LOQ in associated project samples. The MSD recovery for nitrite-N was above the laboratory control limit, and the MS and MSD recoveries for sulfate were below the laboratory control limit.*

c. Were corrective actions documented? **Yes / No / NA (Please explain.)**
Comments: *No corrective actions were noted.*

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The high CCV recoveries for multiple analytes that were outside of QC limits should not affect the data quality/usability, since these analytes were not detected above the LOQ in the associated samples. The effect of the discrepancies described in the case narrative on the data quality/usability is further described in Section 6b.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA (Please explain.)**
Comments:

b. All applicable holding times met? **Yes / No / NA (Please explain.)**
Comments:

c. All soils reported on a dry-weight basis? **Yes / No / NA (Please explain.)**

Comments: *Samples submitted were groundwater samples.*

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA (Please explain.)**
Comments: *Certain analytes have DLs, LODs, or LOQs greater than the Cleanup Level, as indicated in the validated analytical data tables.*

e. Data quality or usability affected? **(Please explain.)**
Comments: *The presence of an undetected analyte above the cleanup level cannot be confirmed when the DL, LOD, or LOQ is above the cleanup level. Analytes with DLs, LODs, or LOQs greater than the Cleanup Level are indicated in the validated analytical tables.*

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

iii. If above PQL, what samples are affected? ***NA***
Comments:

iv. Do the affected sample(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

v. Data quality or usability affected? **(Please explain.)** ***NA***
Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples?
(LCS/LCSD required per AK methods, LCS required per SW846) **Yes / No / *NA***
(Please explain.)
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments: *2-Butanone (MEK), bromoform, and dibromochloromethane were recovered above QC limits (biased high) in the LCS/LCSD associated with project samples 10FROAWA-09 and 10FROAWA-10; these analytes were not detected above the LOQ in these samples.*

Acetone, 2-butanone (MEK), carbon tetrachloride, 1,1,1,2-tetrachloroethane, 1,2-dibromo-3-chloropropane, bromoform, and dibromochloromethane were recovered above QC limits (biased high) in the LCS/LCSD associated with project sample 10FROAWA-11; these analytes were not detected above the LOQ in the sample.

Nitrite, sulfate, and fluoride were recovered outside of QC limits in the MS/MSD. Nitrite was recovered above control limit, and sulfate was recovered below the control limit; the project samples were not analyzed for fluoride. Nitrite was not detected above the LOQ in the associated samples.

iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments: *LCS only for methods 6020 and 9056. MS/MSD used for RPD.*

v. If %R or RPD is outside of acceptable limits, what samples are affected? ***NA***
Comments:

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

vii. Data quality or usability affected? Explain. ***NA***
Comments: *The data quality/usability should not be affected by the analytes with LCS/LCSD recoveries above QC limits, since these analytes were not detected in the project samples.*

The nitrite and sulfate recoveries outside QC limits in the MS/MSD sample should not affect the project samples, since the LCS recoveries for these analytes are within QC range and the sample selected as the MS/MSD was not collected from the project site

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? **Yes / No / NA (Please explain.)**
Comments: *Surrogate recoveries were not reported for Method RSK 175, but are not used in this method.*

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes / No / NA (Please explain.)**
Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain. ***NA***
Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.) Water and Soil

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)**
Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**

iii. All results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

iv. If above PQL, what samples are affected? ***NA***
Comments**:**

v. Data quality or usability affected? Explain. ***NA***
Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA (Please explain.)
Comments: *1-in-10 ratio met for project, duplicates not included in this work order.*

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments: *Duplicates were not included in this work order.*

iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) **Yes / No / NA (Please explain.)**
Comments: *Duplicates were not included in this work order.*

iv. Data quality or usability affected? Explain. ***NA***
Comments:

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
Yes / No / NA (Please explain.)

i. All results less than PQL? **Yes / No / NA (Please explain.)**
Comments: *Chloroform was detected at an estimated concentration between the DL and the LOQ in equipment blank EBOUE02; chloroform was not detected in project samples above the LOQ. Methane was also detected at the reporting limit in equipment blank EBOUE02; Methane was also detected at an estimated concentration in the associated project sample.*

ii. If results are above PQL, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Explain. ***NA***
Comments: *Since chloroform was not detected in project samples above the LOQ, the data quality/usability should not be affected. Since methane was detected in project sample 10FROAWA-10 at an estimated concentration between the DL and the LOQ, the sample is flagged (U) as not detected at the LOQ.*

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-specific, etc.)

a. Are they defined and appropriate? **Yes / No / NA**
Comments:

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: JBER-Richardson – Operable Unit E **Date:** January 2012

Laboratory Report Date: December 17, 2010

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Jessica Morris
Title: Environmental Engineer

Laboratory Name: SGS North America, Inc.
Work Order Number: 1106170

ADEC File Number: 2102.38.005
ADEC RecKey Number:
(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes / No / NA (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
Comments: *Samples were shipped to Columbia Analytical Services (CAS) in Simi Valley, California for analysis of methane. ADEC does not require laboratory certification for methane analysis by method RSK 175. However, CAS is certified under the United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP).*

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (Please explain.)
Comments**:** *The COC was not signed when the samples for methane analysis were received at CAS.*

b. Correct analyses requested? **Yes / No / *NA* (Please explain.)**
Comments**:**

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
Yes / No / NA (Please explain.)
Comments:

b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes / No / NA (Please explain.)**
Comments:

c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes / No / NA (Please explain.)**
Comments:

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments:

e. Data quality or usability affected? **(Please Explain.)** ***NA***
Comments:

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments: *Sulfate was recovered below QC limits in the MS/MSD samples, but was recovered within limits for the BMS/BMSD samples.*

Multiple analytes were recovered outside of QC limits (biased high) in the LCS/LCSD, CCV, and BMS/BMSD; corresponding analytes were not detected above the LOQ in associated project samples.

The RPD for chloroethane does not meet QC criteria for the LCS/LCSD; chloroethane was not detected above the LOQ in the associated samples.

c. Were corrective actions documented? **Yes / No / NA (Please explain.)**
Comments: *No corrective actions were noted.*

d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The high CCV recoveries for most analytes should not affect the data quality/usability, since these analytes were not detected above the LOQ in the associated samples. However, 1,1,1,2-tetrachloroethane and carbon tetrachloride were recovered outside QC limits (biased high); one or both of these analytes were also detected at*

estimated concentrations between the DLs and LOQs in project samples 10FROAWA-13 and 10FROAWA-15. The 1,1,1,2-tetrachloroethane concentration in sample 10FROAWA-15, and the carbon tetrachloride concentrations in samples 10FROAWA-13 and 10FROAWA-15 will be flagged as estimated concentrations that may be biased high. The effect of the rest of the discrepancies described in the case narrative on the data quality/usability is further described in other sections of this checklist.

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No / NA (Please explain.)**
Comments:

b. All applicable holding times met? **Yes / No / NA (Please explain.)**
Comments:

c. All soils reported on a dry-weight basis? **Yes / No / NA (Please explain.)**
Comments: *Samples submitted were groundwater samples.*

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA (Please explain.)**
Comments:
Certain analytes have DLs, LODs, or LOQs greater than the Cleanup Level, as indicated in the validated analytical data tables.

e. Data quality or usability affected? **(Please explain.)**
Comments:
The presence of an undetected analyte above the cleanup level cannot be confirmed when the DL, LOD, or LOQ is above the cleanup level. Analytes with DLs, LODs, or LOQs greater than the Cleanup Level are indicated in the validated analytical tables.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

iii. If above PQL, what samples are affected? *NA*
Comments:

iv. Do the affected sample(s) have data flags? **Yes / No / NA**

Comments:

If so, are the data flags clearly defined? **Yes / No /** **NA**
Comments:

v. Data quality or usability affected? **(Please explain.)** ***NA***
Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846) **Yes / No / *NA* (Please explain.)**
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

Multiple VOC analytes including 1,1,1,2-tetrachloroethane, 2-butanone (MEK), bromoform, carbon tetrachloride, acetone, and dibromochloromethane were recovered above QC limits (biased high) in the LCS/LCSD; most of these analytes were not detected above the LOQ in associated project samples. However, estimated concentrations of 1,1,1,2-tetrachloroethane and carbon tetrachloride were detected in two project samples between the DL and LOQ.

Multiple VOC analytes including 1,1,1,2-tetrachloroethane, bromoform, carbon tetrachloride, chloroethane, and dibromochloromethane were recovered above QC limits (biased high) in the BMS/BMSD. Corresponding analytes were not detected above the LOQ in associated project samples. However, estimated concentrations of 1,1,1,2-tetrachloroethane and/or carbon tetrachloride were detected in samples 10FROAWA-13 (carbon tetrachloride) and 10FROAWA-15 (both analytes) between the DL and LOQ.

Sulfate was recovered below QC limits in the MS/MSD samples, but was recovered within limits in the BMS/BMSD samples. The LCS and duplicate-sample recoveries were also within control limits.

iv. Precision – All relative percent differences (RPDs) reported and less than method or

laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments: *The reported RPD for the LCS/LCSD for chloroethane was above laboratory control limits. Chloroethane was not detected above the LOQ in associated project samples, so results were unaffected.*

v. If %R or RPD is outside of acceptable limits, what samples are affected? ***NA***
Comments: *Chloroethane was not detected above the LOQ in associated project samples.*

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

vii. Data quality or usability affected? Explain. ***NA***
Comments: *The data quality/usability should not be affected by most of the analytes with LCS/LCSD recoveries outside of QC limits (biased high), since most these analytes were not detected in the project samples. However, 1,1,1,2-tetrachloroethane and carbon tetrachloride were recovered outside QC limits (biased high), and these analytes were also detected at estimated concentrations between the DLs and LOQs in project samples 10FROAWA-13 and 10FROAWA-15. The 1,1,1,2-tetrachloroethane concentration in sample 10FROAWA-15, and the carbon tetrachloride concentrations in samples 10FROAWA-13 and 10FROAWA-15 will be flagged as estimated concentrations that may be biased high.*

The data quality/usability should not be affected by the RPD in the LCS/LCSD for chloroethane, since chloroethane was not detected in the project samples.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? **Yes / No / NA (Please explain.)**
Comments: *Surrogates recoveries were not reported for Method RSK 175, but are not used in this method.*

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes / No / NA (Please explain.)**
Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain. ***NA***
Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.) Water and Soil

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)**
Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**

iii. All results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

iv. If above PQL, what samples are affected? ***NA***
Comments**:**

v. Data quality or usability affected? Explain. ***NA***
Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA (Please explain.)
Comments: *1-in-10 ratio met for project; duplicates not included in this work order.*

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments: *Duplicates were not included in this work order.*

iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) **Yes / No / NA (Please explain.)**
Comments: *Duplicates were not included in this work order.*

iv. Data quality or usability affected? Explain. ***NA***
Comments:

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
Yes / No / NA (Please explain.) *Disposable bailers were used for sampling, so an*

equipment blank was not necessary.

i. All results less than PQL? **Yes / No / NA (Please explain.)**
Comments:

ii. If results are above PQL, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Explain. ***NA***
Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-specific, etc.)

a. Are they defined and appropriate? **Yes / No / NA**
Comments:

Appendix B4
Sample Receipts and Chain-of-Custody Forms

1106137

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 392-0050

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

2055 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Laboratory SGS
Attn: Jennifer Serna

no preservative

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	VOCs - HCl SW8260B	Sulfate, Nitrate/Nitrite - SW9056	Methane - HCl RSK-175	Dissolved Al, As, Fe, Mn - SW6020 - HNO3 pres.				Total Number of Containers	Remarks/Matrix
10FROAWA01	(8) A→C	1550	11/9/10		X	X							3	Water
10FROAWA02	(1) A→H	1555	11/9/10		X	X	X	X	X				8	Metals-field-filtered
10FROAWA03	(2)	1010	11/10/10		X	X	X	X	X				8	
10FROAWA04	(3)	1215	11/10/10		X	X	X	X	X				8	
10FROAWA05	(4)	1405	11/10/10		X	X	X	X	X				8	
10FROAWA06	(5)	1615	11/10/10		X	X	X	X	X				8	
10FROAWA07	(6)	1620	11/10/10		X	X	X	X	X				8	
10FROAWA08	(7)	1805	11/10/10		X	X	X	X	X				8	

Project Information		Sample Receipt	
Project Number:	32-1-17394	Total Number of Containers	
Project Name:	Ft Rich-OUE	COC Seals/Intact? Y/N/NA	
Contact:	Haydar Turker	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	Shayla Swedlund	(attach shipping bill, if any)	

Instructions

Requested Turnaround Time: Standard

Special Instructions: USACE/Corps Task Order 0013
Contract W911KB-08-D-0005
NPDL 11-012

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 0730	Signature: Time:	Signature: Time:
Printed Name: Shayla Swedlund Date: 11/11/10	Printed Name: HAYDAR TURKER Date: 11/11/10	Printed Name: Date:
Company: Shannon & Wilson	Company: S & W	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 07:30	Signature: Time:	Signature: Time: 09:59
Printed Name: HAYDAR TURKER Date: 11/11/10	Printed Name: Date:	Printed Name: Annie Jan Date: NOV 11, 2010
Company: S & W	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

Cooler # 01

TB = 3.1°C #201

No. 27610

SGS SHORE

1106137

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? * ***Note: Exemption permitted for chilled samples collected less than 8 hours ago.*** Cooler ID: 1 @ 3.1 w/ Therm.ID: 201 Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ ***Note: If non-compliant, use form FS-0029 to document affected samples/analyses.*** If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled." **If temperature(s) <0°C, were all sample containers ice free?**	(Yes) No N/A Yes No (N/A)	
Delivery method (specify all that apply): (Client) USPS Alert Courier Road Runner AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other:	Note airbill/tracking # See Attached or (N/A)	
→ For samples received with payment, note amount ($) and cash / check / CC (circle one). → For samples received in FBKS, ANCH staff will verify all criteria are reviewed.	(N/A) SRF Initiated by: (N/A)	
Do samples **match COC*** (i.e., sample IDs, dates/times collected)? * ***Note: Exemption permitted if collection times differ by less than an hour; in which case, the times on the COC will be used.*** Are analyses requested unambiguous?	(Yes) No N/A (Yes) No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): (Bubble Wrap) (Separate plastic bags) Vermiculite Other:	(Yes) No N/A	
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB? Were the bottles provided by SGS? (Note apparent exceptions.)	(Yes) No N/A Yes No (N/A)	
Were **proper containers** (type/mass/volume/preservative*) used? * ***Note: Exemption permitted for waters to be analyzed for metals.*** Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(Yes) No N/A (Yes) No N/A	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)? ***Refer to attached bottle sheet (form F066) for documentation.***	(Yes) No N/A Yes No (N/A)	
For **RUSH** or **SHORT HOLD TIME** samples, were the COC & this SRF flagged, bottles flagged (e.g., stickers) and lab notified?	(Yes) No N/A	
For client requested, **site-specific QC** (e.g., MS/MSD/DUP), were bottles flagged (e.g., stickers) and numbered accordingly?	Yes No (N/A)	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No (N/A)	
Was the WO# recorded in Front Counter/Sample Receiving log? **For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?**	(Yes) No N/A Yes No (N/A)	SRF Completed by: Bottle Sheet by: PM = N/A
Was **PEER REVIEW** of sample numbering completed (i.e., compare WO# on containers to COC, container ID on containers to COC, unique lab ID on each container?)	(Yes) No N/A	Peer Reviewed by: Metrics:
Additional notes (if applicable):		

WO# (7 digits)	Sample # - Sample #	Container ID - Container ID	Matrix	QC	Preservative (CHECKED)	TEST GROUP	PRINT LABELS	Notes: ANOMALIES - *e.g., preservative added* or SPECIAL HANDLING - *e.g., Multi-Incremental (MI), Field Filter (FF), Lab Filter (LF), use "same jar as" (SJA) for QC, 2xMeOH, bubbles, etc.*
SAMPLE ID			TYPE		CONTAINERS	ANALYSIS		Type comments below:
1106137	001 - 007	A - C	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		
1106137	001 - 007	D - F	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		RSK 175 Methane
1106137	001 - 007	G - G	1 Water		N/A	W_Waters_Dept		
1106137	001 - 007	H - H	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.		
1106137	008 - 008	A - C	1 Water	Trip Blank	HCl * VOA or LL-Hg *	W_GRO/VOA		

1106137

Sample LOCID and Matrix Code List

NPDL #	Cooler/ Custody Seal Number	Delivery Date	Laboratory SDG Number	Lab #	Sample ID	Collection Date	Collection Time	LOCID	Matrix Code
11-012	01	11/11/10			10FROAWA-01	11/9/10	15:50	TB01	WQ
					10FROAWA-02	11/9/10	15:55	AP3468	WG
					10FROAWA-03	11/10/10	10:10	AP3774	WG
					10FROAWA-04	11/10/10	12:15	AP3870	WG
					10FROAWA-05	11/10/10	14:05	AP3871	WG
					10FROAWA-06	11/10/10	16:15	AP4342	WG
					10FROAWA-07	11/10/10	16:20	AP9342	WG
					10FROAWA-08	11/10/10	18:05	EBOUE01	WQ

1106137

1106161

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 392-0050

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

2055 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

Laboratory: SGS
Attn: Jennifer Sema

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	VOCs - HCl SW8260B	Nitrate/Nitrite Sulfate - SW9056 NO3 PO4	Methane - HCl RSK-175	Dissolved Al, As, Fe, Mn - SW6020 HNO3 Pres			Total Number of Containers	Remarks/Matrix
10FR0AWA09	③ A→C	1113	11/11/10		X	X						3	Water
10FR0AWA10	① A→H	1140	↓		X	X	X	X	X			8	; Metals-Field Filtered
10FR0AWA11	② ↓	~~1405~~ 16:05	↓ H.T		X	X	X	X	X			8	; Metals; Field Filtered

Project Information		Sample Receipt	
Project Number:	32-1-17394	Total Number of Containers	
Project Name:	FRich-OUE	COC Seals/Intact? Y/N/NA	
Contact:	Haydar Turker	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	Shayla Swedlund	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	USACE/Corps Task Order 0013 Contract W911KB-08-D-0005 NPDL-11-012

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1645	Signature: Time: 10:20	Signature: Time:
Printed Name: Shayla Swedlund Date: 11/11/10	Printed Name: HAYDAR TURKER Date: 11/12/10	Printed Name: Date:
Company: Shannon & Wilson	Company: S & W	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 16:45	Signature: Time:	Signature: Time: 10:20
Printed Name: HAYDAR TURKER Date: 11/11/10	Printed Name: Date:	Printed Name: Annie Jan Date: Nov 12, 2010
Company: S & W	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

Cooler # 02

TB = 3.8°C # 201

No. 27612

SGS

1106161

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? * ***Note: Exemption permitted for chilled samples collected less than 8 hours ago.*** Cooler ID: 1 @ 3.8 w/ Therm.ID: 201 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ ***Note: If non-compliant, use form FS-0029 to document affected samples/analyses.*** If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled." **If temperature(s) <0°C, were all sample containers ice free?**	(Yes) No N/A Yes No (N/A)	
Delivery method (specify all that apply): (Client) USPS Alert Courier Road Runner AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other:	Note airbill/tracking # See Attached or (N/A)	
→ For samples received with payment, note amount ($) and cash / check / CC (circle one). (N/A) → For samples received in FBKS, ANCH staff will verify all criteria are reviewed. SRF Initiated by: (N/A)		
Do samples **match COC*** (i.e., sample IDs, dates/times collected)? * ***Note: Exemption permitted if collection times differ by less than an hour; in which case, the times on the COC will be used.*** Are analyses requested unambiguous?	(Yes) No N/A (Yes) No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): (Bubble Wrap) (Separate plastic bags) Vermiculite Other:	(Yes) No N/A	
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB? Were the bottles provided by SGS? (Note apparent exceptions.)	(Yes) No N/A Yes No (N/A)	
Were **proper containers** (type/mass/volume/preservative*) used? * ***Note: Exemption permitted for waters to be analyzed for metals.*** Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	(Yes) No N/A (Yes) No N/A	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)? ***Refer to attached bottle sheet (form F066) for documentation.***	(Yes) No N/A Yes No (N/A)	
For **RUSH** or **SHORT HOLD TIME** samples, were the COC & this SRF flagged, bottles flagged (e.g., stickers) and lab notified?	(Yes) No N/A	
For client requested, **site-specific QC** (e.g., MS/MSD/DUP), were bottles flagged (e.g., stickers) and numbered accordingly?	Yes No (N/A)	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No (N/A)	
Was the WO# recorded in Front Counter/Sample Receiving log? **For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?**	(Yes) No N/A Yes No (N/A)	SRF Completed by: Bottle Sheet by: PM = N/A
Was **PEER REVIEW** of sample numbering completed (i.e., compare WO# on containers to COC, container ID on containers to COC, unique lab ID on each container?)	(Yes) No N/A	Peer Reviewed by: Metrics: 1041
Additional notes (if applicable):		

WO# (7 digits)	Sample # - Sample #	Container ID - Container ID	Matrix	QC	Preservative (CHECKED)	TEST GROUP	PRINT LABELS	Notes: ANOMALIES - *e.g., preservative added* or SPECIAL HANDLING - *e.g., Multi-Incremental (MI), Field Filter (FF), Lab Filter (LF), use "same jar as" (SJA) for QC, 2xMeOH, bubbles, etc.*
SAMPLE ID			TYPE		CONTAINERS	ANALYSIS		Type comments below:
1106161	001	002 A C	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		
1106161	001	002 D F	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		**RSK 175 Methane**
1106161	001	002 G G	1 Water		N/A	W_Waters_Dept		
1106161	001	002 H H	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.		
1106161	003	003 A C	1 Water	Trip Blank	HCl * VOA or LL-Hg *	W_GRO/VOA		

1106161

Sample LOCID and Matrix Code List

NPDL #	Cooler/ Custody Seal Number	Delivery Date	Laboratory SDG Number	Lab #	Sample ID	Collection Date	Collection Time	LOCID	Matrix Code
11-012	01	11/11/10			10FROAWA-01	11/9/10	15:50	TB01	WQ
					10FROAWA-02	11/9/10	15:55	AP3468	WG
					10FROAWA-03	11/10/10	10:10	AP3774	WG
					10FROAWA-04	11/10/10	12:15	AP3870	WG
					10FROAWA-05	11/10/10	14:05	AP3871	WG
					10FROAWA-06	11/10/10	16:15	AP4342	WG
					10FROAWA-07	11/10/10	16:20	AP9342	WG
					10FROAWA-08	11/10/10	18:05	EBOUE01	WQ
	02	11/12/10			10FROAWA-09	11/11/10	11:13	TB02	WQ
					10FROAWA-10	11/11/10	11:40	AP3893	WG
					10FROAWA-11	11/11/10	14:05	EBOUE02	WQ

1106161

1106170

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Laboratory SGS
Attn: Jennifer Serna

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No. of Nov 12, 2010	Time	Date Sampled	Comp.	Grab	VOCs - HCl SW 8260B	Nitrate/Nitrite Sulfate - SW9056 no pres	Methane - HCl RSK-175	Dissolved Al, As, Fe, Mn - SW6020 HNO3			Total Number of Containers	Remarks/Matrix
10FROAWA12	~~1 A→H 7 A→C~~	0800	11/12/10		X	X						3	Water
10FROAWA13	2 1 A→H	0838	↓		X	X	X	X	X			8	; Metals - Field Filtered
10FROAWA14	2 3 4 A→H	1154			X	X	X	X	X			16	; MS/MSD
10FROAWA15	5 A→H	1331			X	X	X	X	X			8	;
10FROAWA16	6 ↓	1405			X	X	X	X	X			8	;

SHORT HOLD

Project Information	Sample Receipt
Project Number: 32-1-17394	Total Number of Containers
Project Name: FtRich-OUE	COC Seals/Intact? Y/N/NA
Contact: Hayder Turker	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: Shayla Swedlund	(attach shipping bill, if any)

Instructions

Requested Turnaround Time: Standard

Special Instructions: USACE/Corps Task Order 0013
Contract W911KB-08-D-0005
NPDL 11-012

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1530	Signature: Time: 17:00	Signature: Time:
Printed Name: Shayla Swedlund Date: 11/12/10	Printed Name: Hayder Turker Date: 11/12/10	Printed Name: Date:
Company: Shannon + Wilson	Company: S & W	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 15:30	Signature: Time:	Signature: Time: 17200
Printed Name: Hayder Turker Date: 11/12/10	Printed Name: Date:	Printed Name: Annie Jon Date: Nov 12 2010
Company: S & W	Company:	Company: SGS

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

Cooler #03

TB = 4.8 °C #201

No. 29124

SGS

1106170

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? * ***Note: Exemption permitted for chilled samples collected less than 8 hours ago.*** Cooler ID: 1 @ 4.8 w/ Therm.ID: 201 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ ***Note: If non-compliant, use form FS-0029 to document affected samples/analyses.*** If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled." **If temperature(s) <0°C, were all sample containers ice free?**	(Yes) No N/A Yes No (N/A)	
Delivery method (specify all that apply): (Client) USPS Alert Courier Road Runner AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other:	Note airbill/tracking # See Attached or (N/A)	
→ For samples received with payment, note amount ($) and cash / check / CC (circle one). (N/A) → For samples received in FBKS, ANCH staff will verify all criteria are reviewed. SRF Initiated by: (N/A)		
Do samples **match COC*** (i.e., sample IDs, dates/times collected)? * ***Note: Exemption permitted if collection times differ by less than an hour; in which case, the times on the COC will be used.*** Are analyses requested unambiguous?	(Yes) No N/A (Yes) No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	(Yes) No N/A	
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB? Were the bottles provided by SGS? (Note apparent exceptions.)	(Yes) No N/A Yes No (N/A)	
Were **proper containers** (type/mass/volume/preservative*) used? * ***Note: Exemption permitted for waters to be analyzed for metals.*** Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No N/A (Yes) No N/A	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)? ***Refer to attached bottle sheet (form F066) for documentation.***	(Yes) No N/A Yes No (N/A)	
For **RUSH** or **SHORT HOLD TIME** samples, were the COC & this SRF flagged, bottles flagged (e.g., stickers) and lab notified?	(Yes) No N/A	
For client requested, **site-specific QC** (e.g., MS/MSD/DUP), were bottles flagged (e.g., stickers) and numbered accordingly?	Yes No (N/A)	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	(Yes) No (N/A)	
Was the WO# recorded in Front Counter/Sample Receiving log? **For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?**	(Yes) No N/A Yes No (N/A)	SRF Completed by: Bottle Sheet by: PM = N/A
Was **PEER REVIEW** of sample numbering completed (i.e., compare WO# on containers to COC, container ID on containers to COC, unique lab ID on each container?)	Yes No N/A	Peer Reviewed by: 1712 Metrics:
Additional notes (if applicable):		

WO# (7 digits)	Sample # - Sample #	Container ID - Container ID	Matrix	QC	Preservative (CHECKED)	TEST GROUP	PRINT LABELS	Notes: ANOMALIES - *e.g., preservative added* or SPECIAL HANDLING - *e.g., Multi-Incremental (MI), Field Filter (FF), Lab Filter (LF), use "same jar as" (SJA) for QC, 2xMeOH, bubbles, etc.*
SAMPLE ID			TYPE		CONTAINERS	ANALYSIS		Type comments below:
1106170	001 001	A C	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		
1106170	001 001	D F	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		RSK 175 Methane
1106170	001 001	G G	1 Water		N/A	W_Waters_Dept		
1106170	001 001	H H	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.		
1106170	002 002	A B	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		
1106170	002 002	C D	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		RSK 175 Methane
1106170	002 002	E E	1 Water		N/A	W_Waters_Dept		
1106170	002 002	F F	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.		1106170
1106170	002 002	G G	1 Water		N/A	W_Waters_Dept		
1106170	002 002	H H	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.		
1106170	003 003	A B	1 Water	MS	HCl * VOA or LL-Hg *	W_GRO/VOA		
1106170	003 003	C D	1 Water	MS	HCl * VOA or LL-Hg *	W_GRO/VOA		RSK 175 Methane
1106170	003 003	E E	1 Water	MS	N/A	W_Waters_Dept		SJA 2E
1106170	003 003	F F	1 Water	MS	HNO3 (pH <2)	W_Metals_Total/Diss.		SJA 2F
1106170	003 003	G G	1 Water	MS	N/A	W_Waters_Dept		SJA 2G
1106170	003 003	H H	1 Water	MS	HNO3 (pH <2)	W_Metals_Total/Diss.		SJA 2H
1106170	004 004	A B	1 Water	MSD	HCl * VOA or LL-Hg *	W_GRO/VOA		
1106170	004 004	C D	1 Water	MSD	HCl * VOA or LL-Hg *	W_GRO/VOA		RSK 175 Methane
1106170	004 004	E E	1 Water	MSD	N/A	W_Waters_Dept		SJA 2E
1106170	004 004	F F	1 Water	MSD	HNO3 (pH <2)	W_Metals_Total/Diss.		SJA 2F
1106170	004 004	G G	1 Water	MSD	N/A	W_Waters_Dept		SJA 2G
1106170	004 004	H H	1 Water	MSD	HNO3 (pH <2)	W_Metals_Total/Diss.		SJA 2H
1106170	005 006	A C	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		

WO# (7 digits)	Sample # - Sample #	Container ID - Container ID	Matrix	QC	Preservative (CHECKED)	TEST GROUP	PRINT LABELS	Notes: ANOMALIES - *e.g., preservative added* or SPECIAL HANDLING - *e.g., Multi-Incremental (MI), Field Filter (FF), Lab Filter (LF), use "same jar as" (SJA) for QC, 2xMeOH, bubbles, etc.*
SAMPLE ID			TYPE		CONTAINERS	ANALYSIS		Type comments below:
1106170	005 - 006	D - F	1 Water		HCl * VOA or LL-Hg *	W_GRO/VOA		**RSK 175 Methane**
1106170	005 - 006	G - G	1 Water		N/A	W_Waters_Dept		
1106170	005 - 006	H - H	1 Water		HNO3 (pH <2)	W_Metals_Total/Diss.		
1106170	007 - 007	A - C	1 Water	Trip Blank	HCl * VOA or LL-Hg *	W_GRO/VOA		

1106170

Sample LOCID and Matrix Code List

NPDL #	Cooler/ Custody Seal Number	Delivery Date	Laboratory SDG Number	Lab #	Sample ID	Collection Date	Collection Time	LOCID	Matrix Code
11-012	01	11/11/10			10FROAWA-01	11/9/10	15:50	TB01	WQ
					10FROAWA-02	11/9/10	15:55	AP3468	WG
					10FROAWA-03	11/10/10	10:10	AP3774	WG
					10FROAWA-04	11/10/10	12:15	AP3870	WG
					10FROAWA-05	11/10/10	14:05	AP3871	WG
					10FROAWA-06	11/10/10	16:15	AP4342	WG
					10FROAWA-07	11/10/10	16:20	AP9342	WG
					10FROAWA-08	11/10/10	18:05	EBOUE01	WQ
	02	11/12/10			10FROAWA-09	11/11/10	11:13	TB02	WQ
					10FROAWA-10	11/11/10	11:40	AP3893	WG
					10FROAWA-11	11/11/10	14:05	EBOUE02	WQ
	02	11/12/2010			10FROAWA-12	11/12/10	8:00	TB03	WQ
					10FROAWA-13	11/12/10	8:38	AP4341	WG
					10FROAWA-14	11/12/10	11:54	AP3534	WG
					10FROAWA-15	11/12/10	13:31	AP4413	WG
					10FROAWA-16	11/12/10	14:05	AP4411	WG

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Appendix B5
COELT (electronic file only)