UNITED STATES AIR FORCE
JOINT BASE ELMENDORF-RICHARDSON
ALASKA

ENVIRONMENTAL RESTORATION PROGRAM

2014 ANNUAL FIELD ACTIVITIES REPORT
CERCLA SITES

FINAL

DECEMBER 2015

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2014 ANNUAL FIELD ACTIVITIES REPORT
CERCLA SITES

JOINT BASE ELMENDORF-RICHARDSON, ALASKA

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LIST OF ACRONYMS

µg/g	micrograms per gram
µg/L	micrograms per liter
°C	degrees Celsius
AAC	Alaska Administrative Code
ACM	asbestos-containing material
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAIS	Chemical Agent Identification Set
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M HILL	CH2M Hill Constructors, Inc.
cm/sec	centimeters per second
COC	contaminant of concern
COPC	contaminant of potential concern
CRREL	Cold Regions Research and Engineering Laboratory
DCA	dichloroethane
DCE	dichloroethene
DD	Decision Document
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DPW	Directorate of Public Works
DRO	diesel-range organics
EAFB	Elmendorf Air Force Base
EOD	Explosive Ordnance Disposal
EPA	United States Environmental Protection Agency
ERF	Eagle River Flats
ERP	Environmental Restoration Program
ERPIMS	Environmental Restoration Program Information Management Systems
ESD	Explanation of Significant Differences
FD	field duplicate
FFA	Federal Facilities Agreement
ft	feet (foot)
ft/ft	feet per foot
GIS	geographic information system
GPS	Geographic Positioning System
GRO	gasoline-range organics
HDPE	high density polyethylene

LIST OF ACRONYMS (CONTINUED)

HVE	high-vacuum extraction
ICs	institutional controls
I-RACR	Interim Remedial Action Completion Report
JBER	Joint Base Elmendorf-Richardson
JBER-E	Joint Base Elmendorf-Richardson-Elmendorf
JBER-R	Joint Base Elmendorf-Richardson-Richardson
JP-4	Jet Propulsion Fuel Number 4
LTM	long-term management
LSI	limited site investigation
LUC	land use control
MCL	maximum contaminant level
µg/L	microgram(s) per liter
µm	micrometer
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeter
mS/cm	milliSiemens per centimeter
MNA	monitored natural attenuation
mV	millivolts
NCP	National Contingency Plan
ND	non-detect
NFA	No Further Action
NPL	National Priorities List
NST	no significant trend
NTU	Nephelometric Turbidity Units
OB/OD	Open Burn/Open Detonation
OES	Optimized Exit Strategy
ORP	oxidation-reduction potential
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon(s)
PBC	Performance-Based Contract
PBR	Performance-Based Remediation
PCA	1,1,2,2-tetrachloroethane
PCB	polychlorinated biphenyl(s)
PCE	tetrachloroethene
PDBS	passive diffusion bag sampler(s)
POL	petroleum, oil, and lubricant
QA	quality assurance

LIST OF ACRONYMS (CONTINUED)

QC	quality control
RI/FS	remedial investigation/feasibility study
RA-O	Remedial Action-Operation
RCRA	Resource Conservation and Recovery Act
RBC	risk-based concentration
ROD	Record of Decision
RRO	residual-range organics
SERA	State-Elmendorf Environmental Restoration Agreement
SVE	soil vapor extraction
SVOC	semi-volatile organic compound(s)
TAH	total aromatic hydrocarbon(s)
TAqH	total aqueous hydrocarbon(s)
TCA	trichloroethane
TCE	trichloroethene
TCRA	Time Critical Removal Action
TFH	total fuel hydrocarbons
TSCA	Toxic Substance Control Act
UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
USACE	United States Army Corps of Engineers
USAF	United States Air Force
U.S. Army	United States Army
UST	underground storage tank
UU/UE	unlimited use/unrestricted exposure
UXO	unexploded ordnance
VC	vinyl chloride
VOC	volatile organic compound(s)
WESTON	Weston Solutions, Inc.

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1.0 INTRODUCTION

This report summarizes the 2014 annual long-term management (LTM) activities, including remedial action-operation (RA-O) and Record of Decision (ROD) requirements, conducted at Joint Base Elmendorf-Richardson (JBER) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. The United States Air Force (USAF) has mandated a reduction of long-term environmental liabilities and life-cycle costs through accelerated cleanup of contaminated sites. In April 2012, Weston Solutions, Inc. (WESTON) was awarded a Performance Based Remediation (PBR) contract from the Air Force Civil Engineer Center (AFCEC) (Contract Number FA8903-09-D-8589, Task Order No. 0016). The contract includes performing RA-O and ROD requirements at several JBER sites. The WESTON team performing the activities summarized in this report consists of WESTON and CH2M HILL Constructors, Inc. (CH2M HILL). WESTON executed project work on sites located within JBER-Elmendorf (JBER-E), while CH2M HILL executed project work on sites located within JBER-Richardson (JBER-R). Figure 1-1 provides the location of each CERCLA site discussed in this report.

The former Elmendorf Air Force Base (EAFB) was proposed for the National Priorities List (NPL) in 1989 and was placed on the NPL in August 1990. In November 1991, a Federal Facilities Agreement (FFA) was negotiated between the USAF, the United States Environmental Protection Agency (EPA), and the Alaska Department of Environmental Conservation (ADEC), establishing a procedural framework and schedule for all CERCLA activities conducted on EAFB.

Several contaminated sites within JBER are the result of contamination related to petroleum spills and releases; however, provisions within CERCLA sections 101(14) and 104(a)(2) exclude petroleum related contamination from CERCLA hazardous substance regulation. Therefore, contaminated sites related to petroleum spills and releases within JBER are governed by State of Alaska cleanup regulations.

In October 1992, the State-Elmendorf Environmental Restoration Agreement (SERA) was signed between Elmendorf AFB and the ADEC. This cooperative agreement addressed the cleanup and restoration of sites contaminated with petroleum, oil, and lubricants (POL). The USAF and ADEC later agreed that the agreement was no longer necessary, and it was dissolved in October 2002. JBER now addresses the cleanup of any petroleum releases following 18 Alaska Administrative Code (AAC) 75 for contaminated sites and 18 AAC 78 for underground storage tanks (UST).

In June 1993, Fort Richardson was proposed to be placed on the NPL, and an FFA was established in December 1994 to address the cleanup of source areas under the CERCLA regulations. In April 1993, the former Fort Richardson signed a two-party agreement with ADEC (State-Fort Richardson UST Compliance Agreement) to bring Fort Richardson into

compliance with UST regulations; in May 1994, the State-Fort Richardson Environmental Restoration Agreement (a two-party agreement with ADEC) was signed to address the cleanup of source areas with releases of POL.

As part of the 2005 Base Realignment and Closure Act, EAFB was slated for realignment with Fort Richardson Army Post. In 2010, EAFB merged with Fort Richardson and the installation was renamed JBER. In this merger, the USAF assumed the responsibility for cleanup of sites formerly managed by the United States Army (U.S. Army) and all of the former Fort Richardson environmental restoration agreements with the regulatory agencies.

Similar to the 2012 and 2013 Annual Report, this annual field activities report was streamlined and condensed due to the large volume of documents that will be prepared for these sites during the period of performance for the PBR contract. The following 2011 annual reports provide additional site information, including previous investigations not provided in this or the 2012 Annual Field Activities Report:

- *2011 JBER Zones 1, 2, and 3 Annual Report* (United States Air Force [USAF], 2012a).
- 2011 Groundwater Monitoring and Borehole Sampling, Three-Party Agreement Sites: Operable Unit B Poleline Road Disposal Area and OUE Armored Vehicle Maintenance Area (USAF, 2012b).

1.1 PURPOSE AND SCOPE

This annual field activities report summarizes the environmental activities conducted in 2014 including sampling, analysis, debris removal, and land use control (LUC) inspections. Fieldwork conducted in 2014 followed the ADEC and EPA-approved *2014 Remedial Action-Operations and Monitoring Letter Work Plan Addendum* (USAF, 2014a). The letter work plan referenced the procedures for performing fieldwork in the *Final Basewide Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP), Revision 1, Joint Base Elmendorf-Richardson, Alaska* (USAF, 2014b). Laboratory acceptance levels for this project are specified in the Basewide *UFP-QAPP*.

1.2 2014 FIELD ACTIVITIES OVERVIEW

This section presents an overview of sampling activities, monitoring well maintenance and flagging activities, LF04 debris removal as well as LUC inspections.

1.2.1 Sampling Activities

Groundwater, surface water, seep, and sediment monitoring at JBER was conducted following procedures outlined in standard operating procedures (SOPs) in the Basewide UFP-QAPP (USAF,2014b). Field activities (e.g., sampling; field screening) were recorded and are included in this report in Appendix A. Digital data captures (hand-held tablet) were conducted at some sites at JBER-E for recording groundwater water quality parameters and site activities. Electronic data was exported from the tablet to an MS Excel spreadsheet following the field

effort so that groundwater sampling forms could be created and data could be uploaded to Environmental Restoration Program Information Management Systems (ERPIMS).

In 2007, the USAF conducted a remedial process optimization (RPO) of the groundwater monitoring program. In the 2007 RPO evaluation, it was determined that Elmendorf AFB had already began optimizing the groundwater monitoring program by "developing criteria to rank groundwater plumes in terms of risk (in 2003)", "using simple mass-based methods to evaluate plume behavior (in 2005)", "continued to focus on managing risk of exposure rather than managing the contaminant plume (in 2006)", and had "dropped MNA parameters from LF59 monitoring program (in 2006)". Following these RPO findings, a recommendation was made in the 2008 Zone 3 Annual Report (Aug 2009) to "reduce the frequency of MNA parameter collection to once every five years", as this collection frequency was thought to be sufficient for evaluating geochemical conditions at each site. JBER-E will collect laboratory MNA parameters once every 5 years, with the next parameters being collected in 2015.

1.2.2 Monitoring Well Maintenance

Minor maintenance, including replacement of caps, locks or bolts, was performed based on the condition of monitoring wells upon observation. Wells with casings that have been found to be frost heaving and hinder closing of the protective cap were cut down. A professional surveyor, licensed in the State of Alaska, determined the northing, easting, ground surface elevation, and top of casing elevation (as necessary) for all modified monitoring points. Well maintenance performed in 2014 is included in the individual Field Activities and Results section for each site. Monitoring well survey data is also provided in Appendix A.

Table 1-1 Future Maintenance Requirements

Site Name	Well ID	Repairs Required
JBER-Elmendorf		
DP098	41755WL-01	Requires relabeling, bolts and a new seal
DP098	41755WL-02	Requires new bolts and relabeling
DP098	41755WL-03	Requires new bolts and relabeling, and outer casing repair
DP098	41755WL-08	Require inspection, casing may have to be cut down and resurveyed
DP098	41755WL-07	Requires casing to be cut down and resurveyed
DP098	41755WL-12	Requires casing to be cut down and resurveyed
LF002	53WL-05	Requires casing to be cut down and resurveyed
LF059	LF59MW-04	Decommission well
LF059	LF59MW-05	Requires relabeling
ST037	Seep 1	Requires more gravel in the collection area
ST037	OU5MW-40	Replace Casing lid.
ST037	OU5MW-01	Well has an obstruction. Needs to be replaced.
ST037	OU5MW-13	Replace lock

Table 1-1 Future Maintenance Requirements (Continued)

Site Name	Well ID	Repairs Required
ST037	OU5MW-05	Requires casing to be cut down or shorter cap; needs to be resurveyed if cut down.
JBER-Richardson		
CG039	Site wide	Three new signs addressing authorized entry to the site are being made and will be hung at the main access gate and two other locations for potential entry in 2015
XE023	Site wide	Monitoring wells are present, but long-term monitoring and LUCs for groundwater are not part of the selected remedy.

1.2.3 Monitoring Well Flagging

Groundwater monitoring wells located on JBER-E near roads or winter snowmobile trails are flagged seasonally with 8-foot tall orange snow poles for safety. Most snow poles were removed in the spring and reinstalled in October 2014; however, some were left in place for visibility to nearby construction activity or to enhance visibility of the well locations amid dense vegetation. All of the flags left in place were checked in fall 2014 to ensure they were in good condition. A list of wells that received snow poles or were checked in 2014 is included in Appendix A.

1.2.4 LF04 Erosion Survey and Debris Removal

In accordance with the most recent Source LF04 Operations and Management Plan (USAF, 2010a) and LF04 Memorandum to the Site File (USAF, 2008a), exposed debris at the base of the LF04 bluff was surveyed, removed (where possible) and appropriately disposed of in late summer during the 2014 field season.

Access to the bluff was requested and coordinated with the Port of Anchorage prior to entering the secured site. Prior to LF04 site work, field personnel attended Explosive Ordnance Disposal (EOD) training. After clearance, the survey classified and photographed all debris, established its geodetic location, and managed any potentially hazardous findings. Nonhazardous debris that fell from the hillside was loaded onto vehicles for transport to an on-site staging area. Debris was then transferred to Anchorage Municipal Landfill. A photograph log and disposal receipt is provided in Appendix A.

1.2.5 Land Use Controls Inspection

CERCLA sites require LUC inspections to ensure soils have not been disturbed and transported off-site without proper permits. Table 1-2 identifies the sites where LUC inspections were conducted. These inspections include looking for evidence of excavation, drilling, well installation, groundwater usage, and/or damage to remedial systems and monitoring wells. LUC inspections were performed at each site in September 2014 in accordance with the *Final Land Use Controls Management Plan; Elmendorf Air Force Base, Alaska* (USAF, 2003a). No significant LUC issues were noted. Table 1-1 lists the recommended future maintenance activities identified during the LUC inspections. The repairs will be addressed during the 2015

field season. The 2014 LUC Inspection Checklist forms and photograph logs for each site are provided in Appendix B.

Table 1-2 Land Use Control Inspections

Site ID	Groundwater Monitoring Required (Yes/No)	LUC Inspection Required (Yes/No)	ADEC Site Status
JBER-Elmendorf			
DP098	Yes	Yes	Active
FT023	Yes	Yes	Active
LF002	No	Yes	Active
LF003	No	Yes	Cleanup Complete - Institutional Controls
LF004	Yes	Yes	Active
LF059	Yes	Yes	Cleanup Complete - Institutional Controls
SD015	Yes	Yes	Active
SD024	No	Yes	Active
SD025	Yes	Yes	Cleanup Complete - Institutional Controls
SD029	Yes	Yes	Active
ST037	Yes	Yes	Active
ST041	Yes	Yes	Active
WP014	Yes	Yes	Active
JBER-Richardson			
CG039	Yes	Yes	Active
DA089	Yes	Yes	Active
SS013	Yes	Yes	Cleanup Complete - Institutional Controls
SS044	Yes	Yes	Cleanup Complete - Institutional Controls
XE023	No	Yes	Active
XU022	No	Yes	Active

1.3 JBER-ELMENDORF GEOLOGY, HYDROLOGY AND SURFACE HYDROLOGY

1.3.1 Geology

JBER-E is located within the Susitna Lowlands, a broad lowland area west of the Chugach Mountains (Warhaftig, 1965). The southern third of the installation lies on the Anchorage glacio-fluvial outwash plain. The Elmendorf Moraine (a glacial end moraine) crosses the Base from the southwest to the northeast, and ground moraine and glacio-fluvial soils (unconsolidated deposits between bedrock and the earth's surface) cover the northern portion of JBER. The runways and most of the JBER facilities lie on the relatively flat outwash plain. The outwash soils consist

predominantly of sandy gravels and gravelly sands deposited by streams draining glaciers advancing out of the Knik and Matanuska valleys about 12,000 years ago. The outwash varies in thickness across JBER-E, but tends to be relatively thin just south of the Elmendorf Moraine and increases to a thickness of up to about 60 feet near Ship Creek. Ship Creek, which flows roughly along the southern margin of JBER-E, has deposited an alluvial fan that overlies the outwash where the creek flows out of the Chugach Mountains to the east; and has eroded or incised into the outwash and deposited alluvial floodplain soils on top of the Bootlegger Cove Formation in its western reaches. The Elmendorf Moraine is a low, hummocky ridge composed of a heterogeneous mixture of sand, gravel, silt, and clay, with cobbles and boulders. The moraine was deposited by the glaciers advancing out of the Knik and Matanuska Valleys. The ground moraine north of the end moraine is dominated by low, rolling hills composed of materials similar to those forming the end moraine, and may be mantled with glacio-fluvial soils. Fine-grained glacio-marine and glacio-lacustrine sediments of the Bootlegger Cove Formation underlie the outwash and the moraine.

The geotechnical properties of several of the primary JBER-E soil types have been characterized during site investigations. The data shows that the outwash and glacio-fluvial soils have relatively low fines content, high bulk densities, and low moisture contents, while the moraine soils have higher silt and clay contents, and higher moisture contents, along with relatively high bulk densities.

1.3.2 Hydrology

JBER-E is underlain by two aquifers: a shallow water table aquifer and a deeper, confined aquifer. These aquifers are separated by the Bootlegger Cove Formation, which functions as an aquitard separating the shallow water table aquifer from a deeper, confined aquifer across most of JBER-E. The shallow aquifer is not currently used as a groundwater source on JBER. Water use on JBER is either supplied from Ship Creek or the deep aquifer. There is no communication between shallow and deep aquifers on JBER-E. All references to groundwater in this document relate to the shallow aquifer, unless otherwise specified. Groundwater flow in the outwash plain is generally toward the south or southwest, while groundwater flow in the moraine areas is more variable, and is best characterized using localized data.

The hydraulic conductivity of JBER-E soils has been measured during many site investigations. The data show that the outwash soils, the glacio-fluvial soils north of the Elmendorf Moraine, the Ship Creek alluvium, and the Ship Creek alluvial fan have relatively high hydraulic conductivity values, while the moraine has variable but significantly lower hydraulic conductivity values. In general, the Bootlegger Cove Formation may be characterized as having a very low hydraulic conductivity (although interbedded sand layers exist within the formation).

1.3.3 Surface Hydrology

Surface water bodies on JBER-E include Ship Creek, Six Mile Lake, Six Mile Creek, and several other small lakes north of the Elmendorf Moraine.

Ship Creek flows from the Chugach Mountains to the east of JBER across the southern margin of JBER to Cook Inlet on the west side of JBER. Ship Creek is described as a losing stream where it flows across its alluvial fan at the foot of the mountains (because water from the stream recharges groundwater), and as a gaining stream west of Boniface Road area, where groundwater tends to flow into the stream channel. Ship Creek serves as the main source of drinking water for JBER. Water is taken from the creek at a diversion dam located approximately 10.5 miles upstream from the mouth. A water treatment plant near the dam processes the drinking water.

Six Mile Lake and Six Mile Creek drain much of JBER-E north of the Elmendorf Moraine. Flow in the creek is from east to west, and the creek discharges to the Knik Arm.

1.4 JBER-RICHARDSON GEOLOGY, HYDROLOGY, AND SURFACE HYDROLOGY

1.4.1 Geology

The surficial and subsurface geology and stratigraphy of JBER-R are very complex because the area is covered by glacial, glacial-marine, and glaciofluvial deposits of Quaternary age (Hunter et al., 1999).

The geology underlying JBER-R consists of glacial deposits, alluvial deposits, and metamorphic rock. The northern and central portions of JBER-R are made up of glacial sediments deposited in the Cook Inlet basin during a number of glacial periods. Specifically, terminal moraine deposits (the Elmendorf Moraine) are located directly northwest of the main cantonment area. These soils are composed of fine-grained, poorly sorted glacial materials with interbedded heterogeneous layers of boulders, cobbles, gravel, sand, silt, and clays. Alluvial deposits on the cantonment area are bounded by the Elmendorf Moraine to the northwest and metamorphic bedrock terrain to the southeast. Glacial outwash, alluvial fan, and fluvial deposits comprise the alluvial sediments that range from gravel in the eastern portion of the plain to sand in the southwestern portion. The cantonment area is composed of well bedded deposits with well sorted gravel (Hunter et al., 1999).

The Bootlegger Cove Formation was deposited in this region via glacial outwash deposits and consists primarily of thinly bedded gray to light gray silt clay to clayey silt. The Bootlegger Cove Formation is a common aquitard and confining unit in the area. The ground moraine and the Bootlegger Cove Formation form an irregular surface upon which the younger alluvial sediments were deposited (Hunter et al., 1999).

The Mountain View Fan formation is a large alluvial fan that emanates from the Eagle River Valley and extends under the JBER-R cantonment area. The Elmendorf Moraine borders the fan

to the north while low hills that protrude through younger glacial sediment border the fan to the south. These hills consist of ground moraine. The fan slopes to the west-southwest and extends beyond the base. The fan was likely deposited by ice-marginal, glacially fed streams, based on its composition (stratified outwash) during outburst flooding events from ice-dammed lakes in the Eagle River Valley. Beneath the Mountain View Fan lie older glacial and glacio-marine deposits (Hunter et al., 1999).

Mountains composed of metamorphic bedrock make up the south-central and southern areas of JBER-R (Hunter et al., 1999).

1.4.2 Hydrology

One shallow and one deep groundwater system have been identified in the area of JBER-R (Freethey, 1976); however, three separate aquifer systems exist in the cantonment area, including a shallow unconfined system, a locally confined system, and a deeper confined system. The deep aquifer serves as a secondary drinking water source for JBER-R and JBER-E, as well as for the Municipality of Anchorage when there is low stream flow (Freethey, 1976). Three standby water supply wells supplement the surface water system with a maximum of two of the wells in use at a time during peak demand. The water source for the standby wells is a confined aquifer in the Knik outwash deposit. A drinking water well with a single service connection to the Otter Lake Recreational facility serves a transient population.

The shallow aquifer occurs under unconfined conditions in the Anchorage Plain deposits and in unconfined to semiconfined conditions in the till of the Elmendorf Moraine. Shallow perched groundwater of limited volume and extent exists in localized areas within the Elmendorf Moraine till deposits. Groundwater in the Anchorage Plain deposits occurs between 10 and 20 feet below ground surface (bgs). Flow in the Anchorage Plain is westerly along Ship Creek.

Groundwater in the next deeper aquifer system is most often found at approximately 80 feet within the central part of the cantonment area. The deeper aquifer changes from confined to semiconfined to unconfined, moving from south to north across the cantonment area. The upper confining unit extends along the northern boundary of the cantonment area while the shallow unconfined and locally confined aquifers merge. Overall, the direction of flow in the deeper aquifer tends to be to the northwest. Evidence suggests, however, that flow within the deeper aquifer is also influenced by discontinuous fine-grained units that result in local groundwater flow directions that diverge from the regional pattern. Groundwater flow directions vary widely in the central part of the cantonment area, where the hydraulic gradient is shallower and discontinuous fine-grained units are present at depth (Astley et al., 2000).

Groundwater in the deep confined system is at its shallowest depths (130 feet bgs) in the northern area of JBER-R. The flow in the deep confined system is generally toward Knik Arm in a westerly to northwesterly direction, with a hydraulic gradient between 0.02 and 0.0025 foot per feet (ft/ft). The deep aquifer occurs under confined conditions beneath areas where the

Bootlegger Cove Formation is present. When the Bootlegger Cove Formation is intermittently present or absent, the underlying aquifer can be described as a leaky confined system.

1.4.3 Surface Hydrology

Surface water bodies on JBER-R include Ship Creek, Eagle River, Otter Lake and several other small lakes north of the Elmendorf Moraine.

Ship Creek flows from the Chugach Mountains to the east of JBER across the southern margin of JBER to Cook Inlet on the west side of the Base. Ship Creek is described as a losing stream where it flows across its alluvial fan at the foot of the mountains (because water from the stream recharges groundwater), and as a gaining stream west of Boniface Road area, where groundwater tends to flow into the stream channel. Ship Creek serves as the main source of drinking water for JBER. Water is taken from the creek at a diversion dam located approximately 10.5 miles upstream from the mouth. A water treatment plant near the dam processes the drinking water.

1.5 SITE PRIORITIZATION

This report includes a qualitative evaluation to "prioritize" sites and to give stakeholders an assessment of the overall program status. In 2007 a remedial process optimization (RPO) evaluation first assessed trends in groundwater contaminant concentrations at CERCLA-regulated sites using various statistical tools (USAF, 2008b). Five of the twenty sites presented in this report were originally prioritized in the 2007 RPO report and were updated annually between 2008 and 2011 (USAF, 2012a).

For this report, the objective is to prioritize sites that have not been previously assessed and determine whether current conditions potentially warrant changing the prioritization category for those previously assessed in the RPO framework.

The prioritization category will be presented in each "Site Summary and Recommendations" section. Sites were assigned one of the following categories:

- **Green sites** are sites that meet or are below the defined cleanup levels in the Decision Document (DD) or ROD.
- **Yellow sites** are sites that do not meet the defined cleanup levels and/or have contaminant concentrations nearing cleanup levels.
- **Red sites** are sites that have increasing contaminant concentrations in groundwater defined by a trend analysis. These sites have the highest priority in evaluating how to meet the program objectives.

The Mann-Kendall nonparametric test for trends (Gilbert, 1987) was used at some sites to assess contaminant concentrations trends. Mann-Kendall trends were identified quantitatively as "decreasing", "increasing" or "stable" if the test resulted in a significance of 95%; otherwise, trends were classified as "no trend". A stable plume is defined in 18 AAC 75.345(h)(2) as

having a dissolved phase plume in steady state or shrinking, and having concentrations of the hazardous substance decreasing. Groundwater data from sampling of JBER monitoring wells were evaluated for trend at a 95% confidence level (significance level of $\alpha = 0.05$) using the EPA ProUCL v. 5.0.00 statistical software. Mann-Kendall tests were only performed on constituents that currently exceeded cleanup levels and have been sampled in 2014. Trend graphs were omitted if all constituents in an individual well trend test had outcomes that were statistically insignificant or "no trend".

Additional discussion of the Mann-Kendall methodology and summaries of the Mann-Kendall test outcomes with detailed output files and trend plots are provided in Appendix C.

1.6 CLEANUP LEVELS

Cleanup levels are defined by the ROD for the Operable Unit (OU) that the site is located in. The following RODs define the cleanup levels for the sites in this report:

- *OU1 ROD (USAF, 1994a)*
- *OU2 ROD (USAF, 1995a)*
- *OU3 ROD (USAF, 1997a)*
- *OU4 ROD (USAF, 1995b)*
- *OU5 ROD (USAF, 1995c)*
- *OU6 and Source Area SS19 ROD (USAF, 1997b)*
- *Explanation of Significant Difference (ESD), OU6 (USAF, 2007)*
- *DP98 ROD (USAF, 2004)*
- *OUA and B ROD (USAF, 1997c)*
- *OUC ROD (USAF, 1998a)*
- *OUE ROD (USAF, 2005a)*
- *Memorandum to Site File for SS013 PCB Time Critical Removal Action, Remaining PCB Contamination, and Required Interim Land Use Controls* (USAF, 2014c)
- *2012-2013 Remedial Action Summary Report for XU022 – Operable Unit C, Eagle River Flats Joint Base Elmendorf-Richardson, Alaska* (USAF, 2013a)

1.7 DOCUMENT ORGANIZATION

This document is organized with the following sections:

- Section 1 provides a brief introduction and presents the project purpose and scope.
- Sections 2 through 14 summarize JBER-Elmendorf site-specific information including a site description, regulatory requirements, 2014 field activities and a site summary. At the beginning of Sections 2 through 14, the Performance-Based Contract (PBC) performance objectives are provided for the associated site. These performance objectives were developed by AFCEC and their contractor and were not reviewed or approved of by ADEC or EPA. Where the performance objective is "design and implement an optimized exit strategy", the anticipated achievement date is when the final plan is due to the USAF and is usually at the end of the PBC in 2020.
- Sections 15 through 21 summarize JBER-Richardson site specific information including a site description, regulatory requirements, 2014 field activities and a site summary. At the beginning of Sections 15 through 21, similar to Sections 2 through 14, the PBC performance objectives are provided for the associated site.
- Section 22 provides references used to prepare this document.

This report includes the following three appendices:

- Appendix A – Field Monitoring Records
    - A1 – JBER-Elmendorf Field Records

      Table of Snow-Flagged Monitoring Wells
      Table of Survey Data
      Groundwater, Surface Water and Seep Sample Sheets
      2014 Field Parameters
      Field Notes
      LF04 Debris Removal Photograph Log and Debris Removal Receipt
      OU5 Wetland Inspection Forms and Photo Log
    - A2 – JBER-Richardson Field Records

      Sample Collection Forms
      Field Notes
- Appendix B – LUC Inspection Forms
    - B1 – JBER-Elmendorf LUC Inspection Forms and Photograph Log
    - B2 – JBER-Richardson LUC Inspection Forms

- Appendix C – Laboratory Analytical Data Reports, , Analytical Data Quality Assurance (QA)/Quality Control (QC) Summary Reports and ADEC Laboratory Data Review Checklists, Mann-Kendall Trend Test Analysis Records
    - C1 – JBER-Elmendorf

      Analytical Laboratory Data Reports (on CD only)

      Analytical Data Table, Excel Spreeadsheet (on CD only)

      Analytical Data Quality Assurance QA/QC Summary Report

      ADEC Laboratory Data Review Checklists

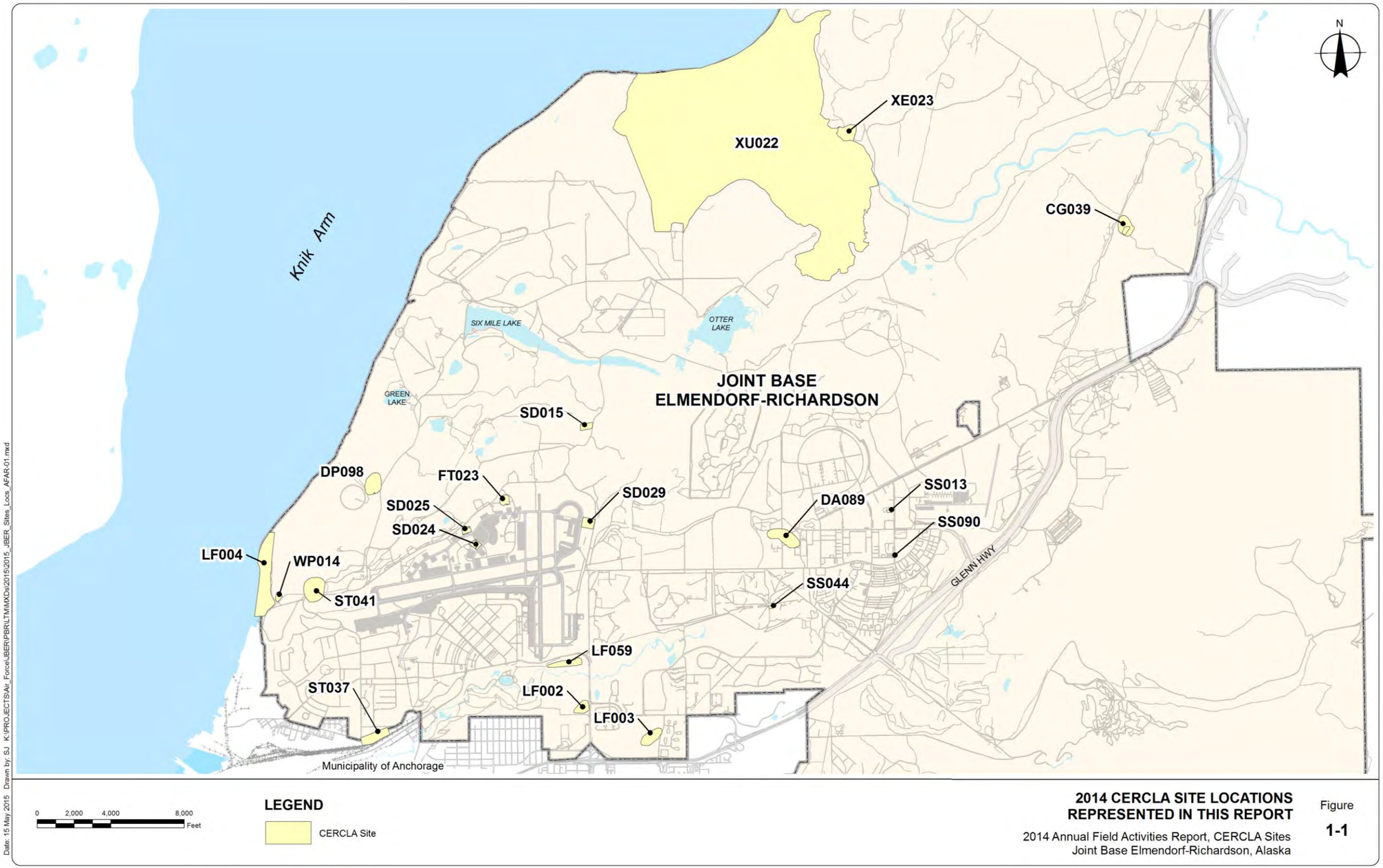
      Mann-Kendall Trend Test Analysis Records
    - C2 – JBER-Richardson

      Analytical Laboratory Data Reports (on CD only)

      Analytical Data QA/QC Summary Report

      ADEC Laboratory Data Review Checklists

Figure 1-1 2014 CERCLA Site Locations Represented in this Report, JBER, Alaska



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2.0 DP098

PBC Performance Objective: Design and Implement Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

2.1 SITE DESCRIPTION

JBER-E Site DP098 is comprised of 27 acres northwest of Buildings 18220 and 18224 on Fairchild Avenue (Figure 2-1). It includes a former vehicle maintenance building (Building 18224), two concrete buildings (Buildings 18218 and 18220), and a fan-shaped area of undeveloped land extending north and west of the perimeter fence.

This site was previously designated and associated with Site ST423 under the SERA investigation of two USTs that serviced Building 18224. In 1995, petroleum-hydrocarbon contamination was discovered in the soil and groundwater during UST removal. During the 1997 SERA Phase VI investigation (USAF, 1998b), measurable concentrations of chlorinated solvents were confirmed in soil and groundwater samples, resulting in the addition of DP098 to the Environmental Restoration Program (ERP) in 1999 for further investigation. In 2000, an engineering evaluation and cost analysis (USAF, 2001) delineated the chlorinated solvent contamination and characterized the site. In 2002, a remedial investigation/feasibility study (RI/FS) (USAF, 2003b) refined the nature and extent of contamination and reviewed data from previous investigations, determining that petroleum hydrocarbons and chlorinated solvents were present in the soil, sediment, and groundwater at DP098 at concentrations greater than cleanup levels.

Contamination at the DP098 site appears to originate from Building 18224 and two USTs located on the southwest corner of the building that had been used to store diesel fuel. The tanks were removed or abandoned in place in 1995 and are thought to have been the source of fuel contamination at the site. Chlorinated solvents were most likely released from Building 18224 through floor drain tiles when it was used as a vehicle maintenance facility.

2.1.1 Geology and Hydrology

DP98 lies on the northwest flank of the Elmendorf Moraine on top of a low hill, at about the 200 foot elevation. The ground surface slopes gently to the northwest for a distance of about 350 feet beyond Building 18224 and then drops steeply about 20 feet into a wetland area about 400 feet from Building 18224 (Figure 2). Soils at the site include surficial fill material in the vicinity of the buildings and possibly extending about 350 feet to the north of the buildings, underlain by about 83 to 112 feet of glacial till composed of gravelly, sandy silts and silty, gravelly sands with scattered cobbles. The fine-grained silts and clays of the Bootlegger Cove Formation are encountered at the 83 to 112 foot depth and they appear to be more than 30 feet thick in the single site boring that penetrated into the formation (USAF, 2003b).

Site DP098 is underlain by two aquifers, a shallow water table aquifer and a deeper, confined aquifer. These aquifers are separated by the Bootlegger Cove Clay which functions as a confining layer (and extends under most of JBER-E). There is no communication between shallow and deep aquifers in the area of investigation. All references to groundwater in this document relate to the shallow aquifer unless otherwise specified.

The depth to groundwater near Building 18224 is between 5 and 10 feet below ground surface (bgs). To the north, just before the break in slope which descends to the wetland, the depth to groundwater is approximately 15 feet and groundwater surfaces as intermittent seeps along the edge of the wetlands at the bottom of the slope . There appears to be divergence of groundwater flow from the UST site downgradient, such that groundwater in the eastern portion of the source area may flow toward 41755WL-08, while groundwater in the western portion of the source area may flow toward 41755WL-07. The wetland extends from the base of the slope about 500 feet in a northerly direction, where surface water is impounded in a small kettle pond.

2.2 REGULATORY REQUIREMENTS

The *DP98 ROD* (USAF, 2004) identified source removal, monitored natural attenuation (MNA), and LUCs as the selected remedy. Identified contaminants of concern (COCs) included only chlorinated solvents (tetrachloroethene [PCE], trichloroethene (TCE), and their degradation products cis-dichloroethene [DCE], 1,1-DCE, and vinyl chloride [VC]). Fuel hydrocarbons are above cleanup levels at D0P98 but were not identified as COCs. The fuel hydrocarbons are expected to aid in the natural attenuation of the chlorinated solvents. The ROD anticipated that, upon completion of natural attenuation of the chlorinated solvents, hydrocarbon contamination would also have naturally attenuated. In 2002, LUCs were implemented. In 2004, monitored natural attenuation of COCs and studies of enhanced bioremediation began. In 2005, a soil hotspot in the vicinity of a suspected drain tile was excavated. As of October 2008, all components of the remedy had been implemented (USAF, 2009a). The MNA component of the selected remedy will continue until COCs meet groundwater cleanup goals.

Current monitoring requirements at DP098 include periodic groundwater and surface water sampling and an annual LUC inspection. Groundwater sampling is required for the COCs referenced above at groundwater monitoring wells 41755WL-01 (every five years), 41755WL-02 (annual), 41755WL-03 (annual), 41755WL-04 (annual), 41755WL-05 (annual), 41755WL-07 (annual), 41755WL-08 (semiannual), 41755WL-09 (annual), 41755WL-12 (every five years), 41755WL-15 (every two years), 41755WL-16 (every two years), 41755WL-17 (every five years), 41755WL-23 (every two years), and DP98INJ-02 (annually). Annual surface water sampling is required for the above COCs at sampling location DP98SW-01. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

2.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, eight groundwater monitoring wells and one surface water location were sampled for site COCs under the LTM program. Surface water locations DP98SW-03 and DP98SW-10 were also sampled based on recommendations provided in the 2011 Annual report. Six of the eight wells sampled and DP98SW-10 had concentrations of contaminants that exceeded cleanup levels cited in the DP098 ROD. Table 2-1 presents a summary of the 2014 analytical results. The 2014 and historical results are presented in Figure 2-1 and Appendix C.

The field parameters measured at the time of sample collection included biogeochemical MNA parameters pH, conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) are included in Appendix A. One field duplicate (FD) sample was collected from well 41755WL-05. Two wells, DP98INJ-02 and 41755WL-02, exceeded drawdown and did not stabilize and two wells, 41755WL-03 and 41755WL-07, went dry and samples were collected the following day. Parameter evaluation of the four remaining wells, and 2014 data, indicates a weakly oxidizing environment. Under aerobic conditions, reductive dechlorination will not occur. Appendix A presents the field parameters for the DP098 wells.

In 2014, additional work at the site was conducted under the *DP098 DNAPL Evaluation Work Plan and UFP-QAPP* to delineate the vertical extent of contamination (USAF, 2014d). The results and conclusions from this investigation are presented in the draft pending *DP098 Limited Site Investigation Report.*

Table 2-1 Summary of 2014 Analytical Results at DP098

Analyte	PCE	TCE	cis-1,2-DCE	1,1-DCE	Vinyl Chloride
Groundwater Cleanup Level [1] (µg/L)	**5 µg/L**	**5 µg/L**	**70 µg/L**	**7 µg/L**	**2 µg/L**
DP98INJ-02	ND [0.5]	1.14	**3990**	**18.9**	**2960**
41755WL-02	**390**	**445**	**1690**	4.18	0.51 J
41755WL-03	ND [0.5]	0.8 J	**499**	1.45	1.17
41755WL-04	ND [0.5]	**6.95**	**585**	2.63	**553**
41755WL-05	ND [0.5]	ND [0.5]	**4680 J**	3.54	**7.1**
41755WL-05 (FD)	ND [0.5]	0.52 J	**2100 J**	3.37	**6.54 J**
41755WL-07	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]
41755WL-08	ND [0.5]	**299**	**275**	0.630 J	ND [0.5]
41755WL-09	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]
Surface Water Cleanup Level[1] (µg/L)	**--**	**5 µg/L**	**5 µg/L**	**--**	**--**
DP98SW-01	ND [0.5]	ND [0.5]	1.00	ND [0.5]	ND [0.5]
DP98SW-03	ND [0.5]	ND [0.5]	1.56	ND [0.5]	ND [0.5]
DP98SW-10	0.31 J	**15.3**	**60.5**	ND [0.5]	ND [0.5]

Notes:

[1] Cleanup levels as cited in the DP098 ROD (USAF, 2004).
-- Not available in the DP098 ROD.

PCE = tetrachloroethene
TCE = trichloroethene
FD = field duplicate
DCE = dichloroethene
ND = non-detect (limit of detection)
Bold result exceeds cleanup level.
J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample

Mann-Kendall trend tests indicated statistically significant decreasing trends at the 95% confidence level for PCE, TCE, and cis-1,2-DCE in well 41755WL-02, TCE and cis-1,2-DCE in wells 41755WL-03 and 41755WL-04, and cis-1,2-DCE and in well 41755WL-05. Statistically significant increasing trends were identified for TCE and cis-1,2-DCE in well 41755WL-08 and for VC in well DP98INJ-02. Statistically insignificant trends or "no trend" were identified for cis-DCE and 1,1 DCE in well DP98INJ-02 and VC in wells 41755WL-04 and 41755WL-05 and TCE for well 41755WL-05. While increasing trends were identified by Mann-Kendall tests for other constituents in some DP098 wells, high censoring (low detection frequencies) makes the trend analysis unreliable and thus are considered to be not significant. Appendix C presents all Mann-Kendall and historical data.

A LUC inspection was performed at DP098 on 17 September 2014. The inspection identified labeling needs for wells 41755WL-01, -02, and -03, additional bolts for 41755WL-01, and -03, and a seal for 41755WL-01; outer casing repair on well 41755WL-03, frost jacking on wells 41755WL-07 and -12 that requires repair (Table 1-2). Well maintenance was performed at one well, 41755WL-08. The well casing was cut down and resurveyed, however the inner casing rebounded throughout the fall/winter and became frost jacked again. . A copy of the 2014 LUC inspection form for DP098 is provided in Appendix B.

2.4 SITE SUMMARY AND RECOMMENDATIONS

During 2014, six of the eight groundwater monitoring wells and one surface water location exhibited concentrations of COCs that exceeded cleanup levels cited in the DP098 ROD. The leading edge of the plume (well 41755WL-08) continues to have increasing levels of TCE and cis-DCE. COCs in the downgradient wells (41755WL-07 and 41755WL-09) were all non-detect. The COC concentration trends for wells and constituents that are currently above cleanup levels are shown in Graphs 2-1 through 2-6.

2.4.1 Five-Year Review

Contaminant concentrations at DP098 remain above cleanup goals; therefore the site is required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. By 2008 the major components of the ROD had been implemented and the site was included in the third JBER-Elmendorf five-year review (USAF, 2008c). Preparation of a remedial action report was recommended. The fourth five-year review report recommended a vapor intrusion evaluation be performed in accordance with EPA guidelines for each occupied facility in proximity to the TCE Plumes (USAF, 2014d). JBER is currently conducting a VI investigation; results will be presented under a separate cover.

2.4.2 Recommendations

Site DP098 is identified as a **Red** priority since the plume continues to have increasing levels of TCE, cis-DCE, and vinyl chloride. A dense non-aqueous phase liquid (DNAPL) Evaluation is projected to be finalized in 2015. The report will provide additional information of the nature and vertical extent of the contamination at the site. The site priority may be updated in 2015 based on the report conclusion.

The 2015 recommendations for the future monitoring at DP098 include the following:

- Annually sample surface water location DP98SW-10 to investigate further the relationship of the plume to surface water contamination.

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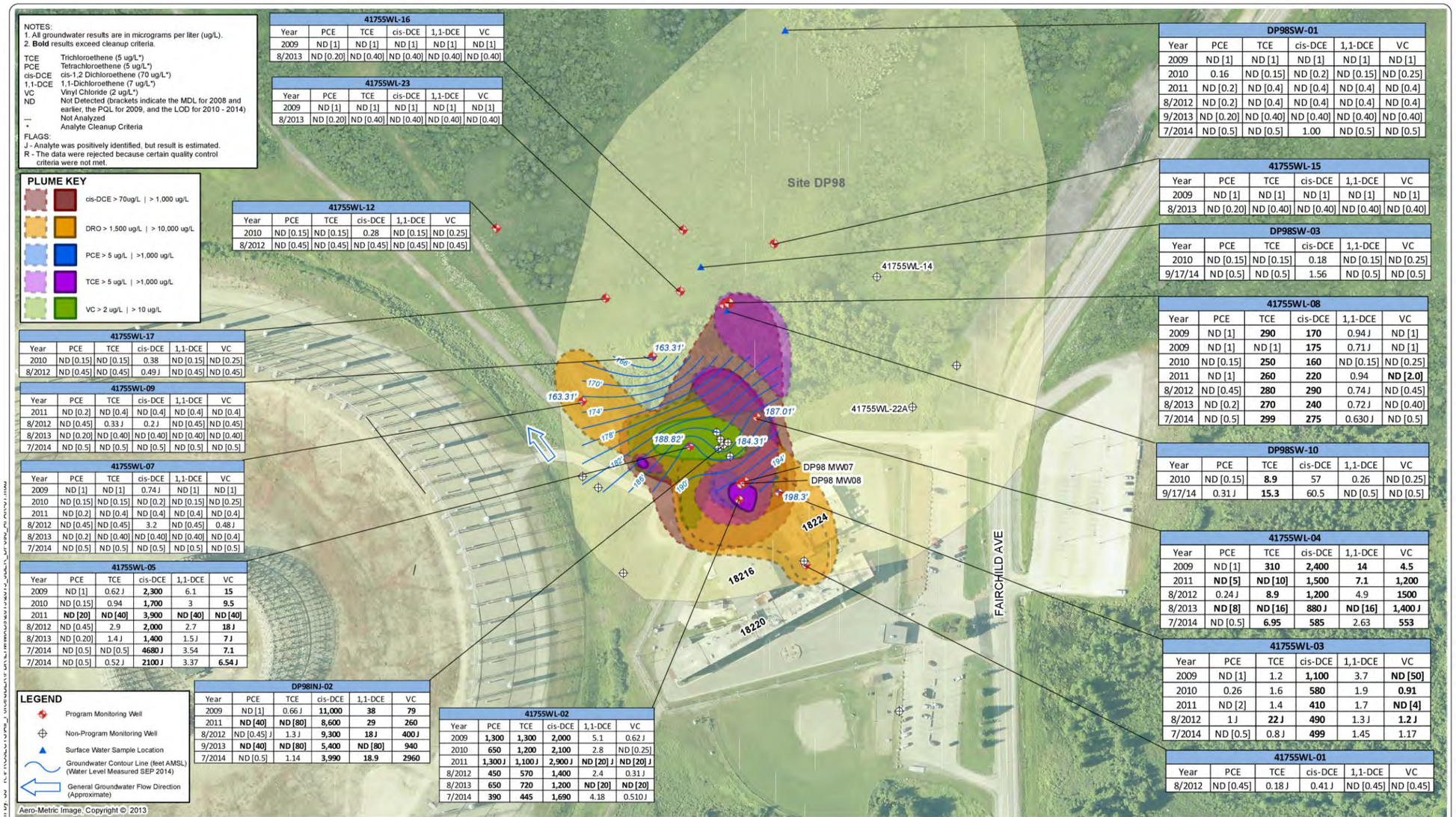
Figure 2-1 DP098 Site Map with Analytical Data



41755WL-16

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]

41755WL-23

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]

41755WL-12

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2010	ND [0.15]	ND [0.15]	0.28	ND [0.15]	ND [0.25]
8/2012	ND [0.45]	ND [0.45]	ND [0.45]	ND [0.45]	ND [0.45]

41755WL-17

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2010	ND [0.15]	ND [0.15]	0.38	ND [0.15]	ND [0.25]
8/2012	ND [0.45]	ND [0.45]	0.49 J	ND [0.45]	ND [0.45]

41755WL-09

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2011	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
8/2012	ND [0.45]	0.33 J	0.2 J	ND [0.45]	ND [0.45]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
7/2014	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]

41755WL-07

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	ND [1]	0.74 J	ND [1]	ND [1]
2010	ND [0.15]	ND [0.15]	ND [0.2]	ND [0.15]	ND [0.25]
2011	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
8/2012	ND [0.45]	ND [0.45]	3.2	ND [0.45]	0.48 J
8/2013	ND [0.2]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.4]
7/2014	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]

41755WL-05

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	0.62 J	**2,300**	6.1	**15**
2010	ND [0.15]	0.94	**1,700**	3	**9.5**
2011	**ND [20]**	**ND [40]**	**3,900**	**ND [40]**	**ND [40]**
8/2012	ND [0.45]	2.9	**2,000**	2.7	**18 J**
8/2013	ND [0.20]	1.4 J	**1,400**	1.5 J	**7 J**
7/2014	ND [0.5]	ND [0.5]	**4680 J**	3.54	**7.1**
7/2014	ND [0.5]	0.52 J	**2100 J**	3.37	**6.54 J**

DP98INJ-02

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	0.66 J	**11,000**	**38**	**79**
2011	**ND [40]**	**ND [80]**	**8,600**	**29**	**260**
8/2012	ND [0.45] J	1.3 J	**9,300**	**18 J**	**400 J**
9/2013	**ND [40]**	**ND [80]**	**5,400**	**ND [80]**	**940**
7/2014	ND [0.5]	1.14	**3,990**	**18.9**	**2960**

41755WL-02

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	**1,300**	**1,300**	**2,000**	5.1	0.62 J
2010	**650**	**1,200**	**2,100**	2.8	ND [0.25]
2011	**1,300 J**	**1,100 J**	**2,900 J**	**ND [20] J**	**ND [20] J**
8/2012	**450**	**570**	**1,400**	2.4	0.31 J
8/2013	**650**	**720**	**1,200**	**ND [20]**	**ND [20]**
7/2014	**390**	**445**	**1,690**	4.18	0.510 J

DP98SW-01

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
2010	0.16	ND [0.15]	ND [0.2]	ND [0.15]	ND [0.25]
2011	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
8/2012	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
9/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
7/2014	ND [0.5]	ND [0.5]	1.00	ND [0.5]	ND [0.5]

41755WL-15

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]

DP98SW-03

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2010	ND [0.15]	ND [0.15]	0.18	ND [0.15]	ND [0.25]
9/17/14	ND [0.5]	ND [0.5]	1.56	ND [0.5]	ND [0.5]

41755WL-08

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	**290**	**170**	0.94 J	ND [1]
2009	ND [1]	ND [1]	**175**	0.71 J	ND [1]
2010	ND [0.15]	**250**	**160**	ND [0.15]	ND [0.25]
2011	ND [1]	**260**	**220**	0.94	**ND [2.0]**
8/2012	ND [0.45]	**280**	**290**	0.74 J	ND [0.45]
8/2013	ND [0.2]	**270**	**240**	0.72 J	ND [0.40]
7/2014	ND [0.5]	**299**	**275**	0.630 J	ND [0.5]

DP98SW-10

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2010	ND [0.15]	**8.9**	57	0.26	ND [0.25]
9/17/14	0.31 J	**15.3**	60.5	ND [0.5]	ND [0.5]

41755WL-04

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	**310**	**2,400**	**14**	**4.5**
2011	**ND [5]**	**ND [10]**	**1,500**	**7.1**	**1,200**
8/2012	0.24 J	**8.9**	**1,200**	4.9	**1500**
8/2013	**ND [8]**	**ND [16]**	**880 J**	**ND [16]**	**1,400 J**
7/2014	ND [0.5]	**6.95**	**585**	2.63	**553**

41755WL-03

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2009	ND [1]	1.2	**1,100**	3.7	**ND [50]**
2010	0.26	1.6	**580**	1.9	**0.91**
2011	ND [2]	1.4	**410**	1.7	**ND [4]**
8/2012	1 J	**22 J**	**490**	1.3 J	**1.2 J**
7/2014	ND [0.5]	0.8 J	**499**	1.45	1.17

41755WL-01

Year	PCE	TCE	cis-DCE	1,1-DCE	VC
8/2012	ND [0.45]	0.18 J	0.41 J	ND [0.45]	ND [0.45]

DP098 SITE MAP WITH ANALYTICAL DATA

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Figure **2-1**

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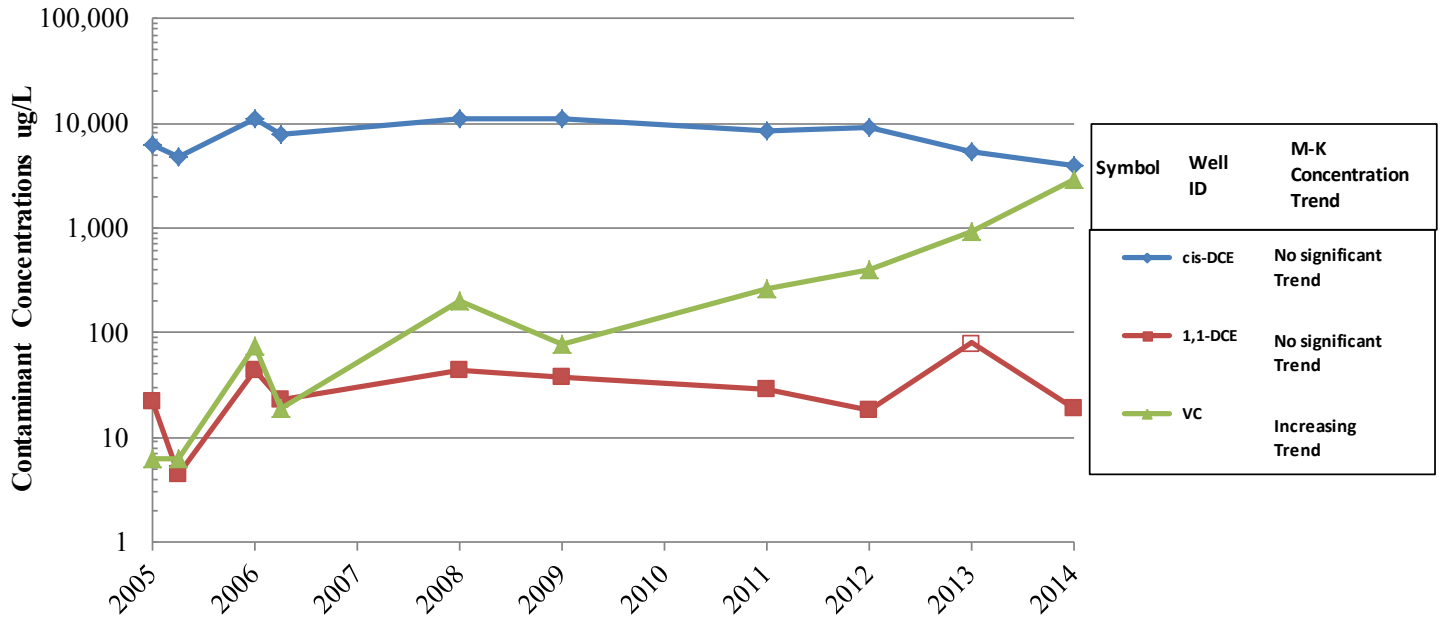
Graph 2-1 DP098 Contaminant Trends in Well DP098INJ-02



DP098 CONTAMINANT TRENDS IN DP98INJ-02

Graph **2-1**

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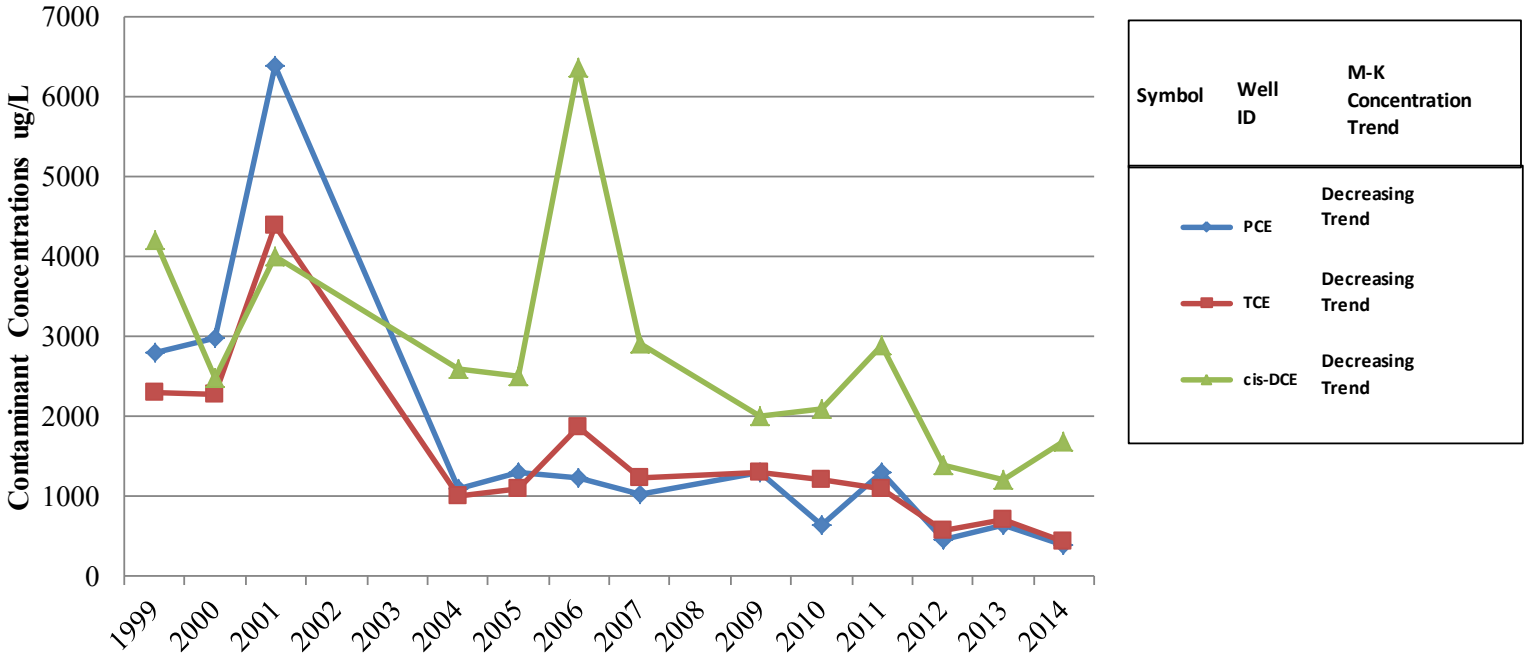
Graph 2-2 DP098 Contaminant Trends in Well 41755WL-02



DP098 CONTAMINANT TRENDS IN 41755WL-02

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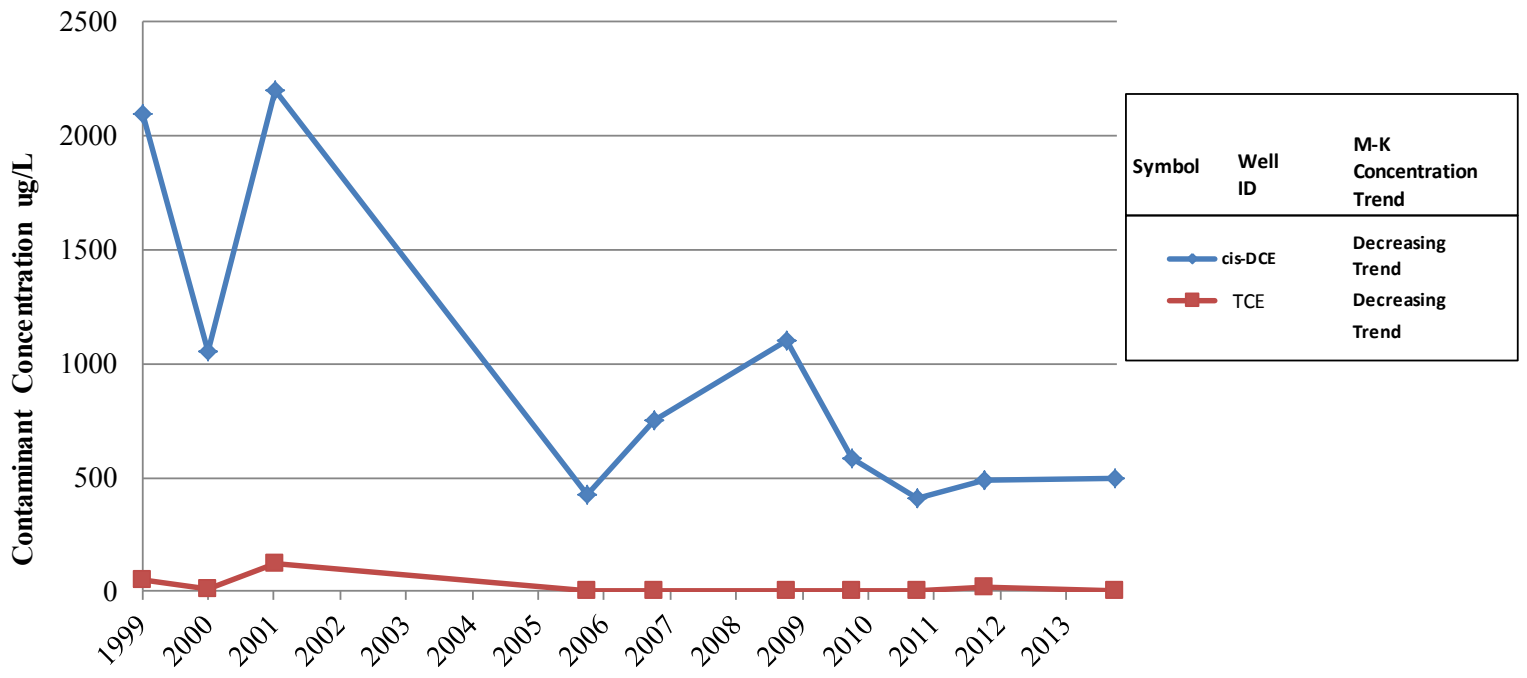
Graph **2-2**

Graph 2-3 DP098 Contaminant Trends in Well 41755WL-03



DP098 CONTAMINANT TRENDS IN 41755WL-03

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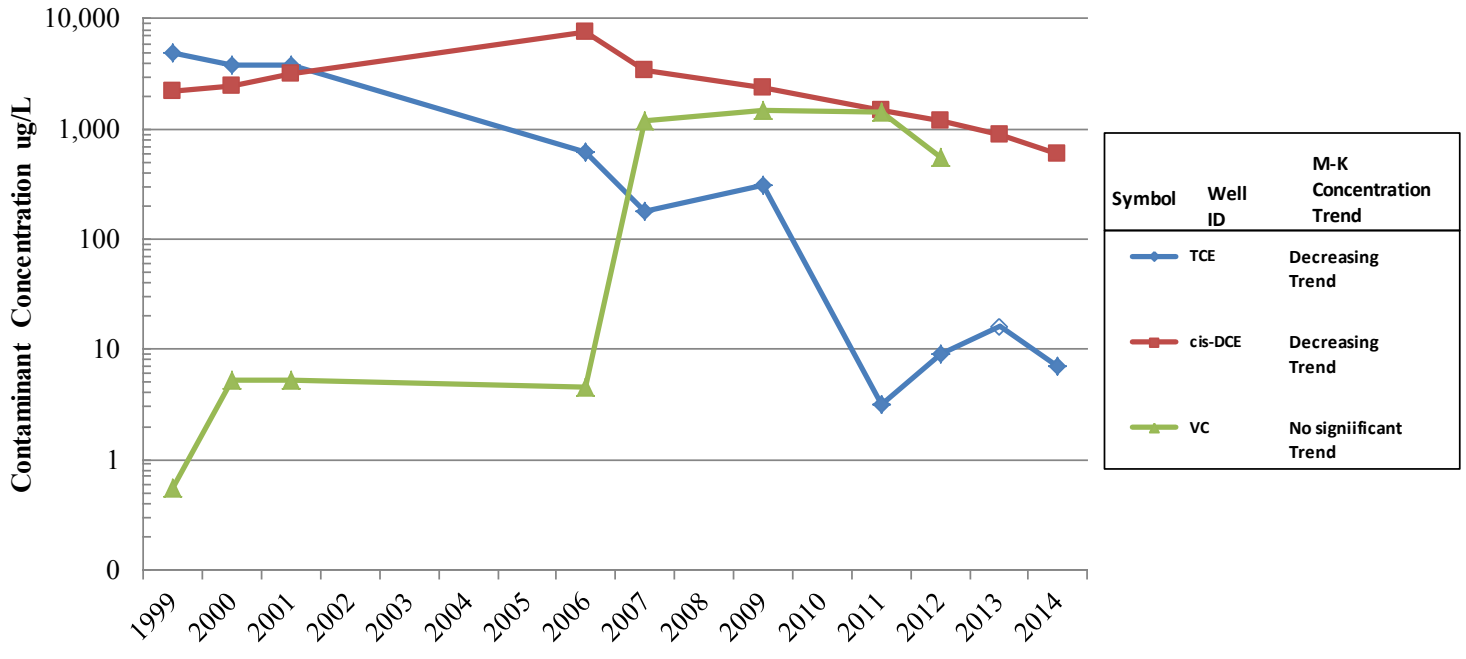
Graph **2-3**

Graph 2-4 DP098 Contaminant Trends in Well 41755WL-04



DP098 CONTAMINANT TRENDS IN 41755WL-04

Graph **2-4**

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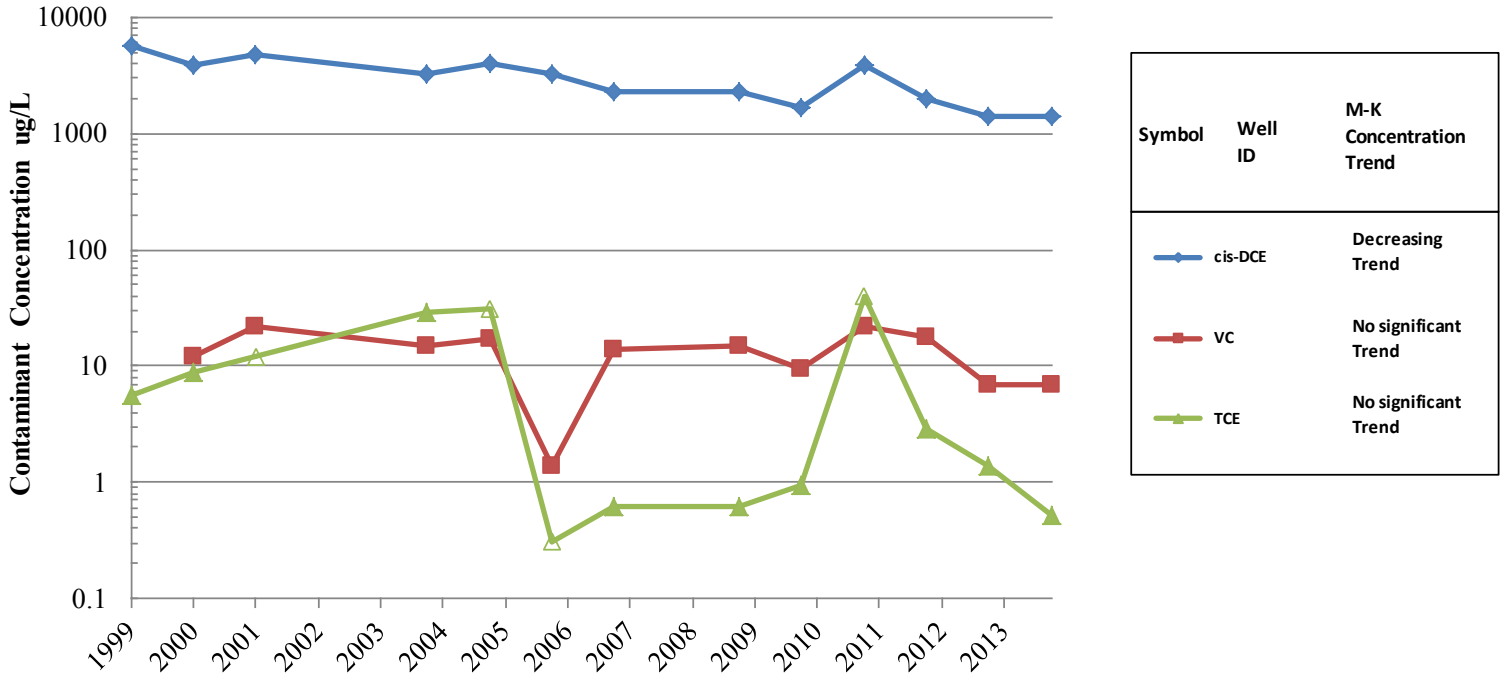
Graph 2-5 DP098 Contaminant Trends in Well 41755WL-05

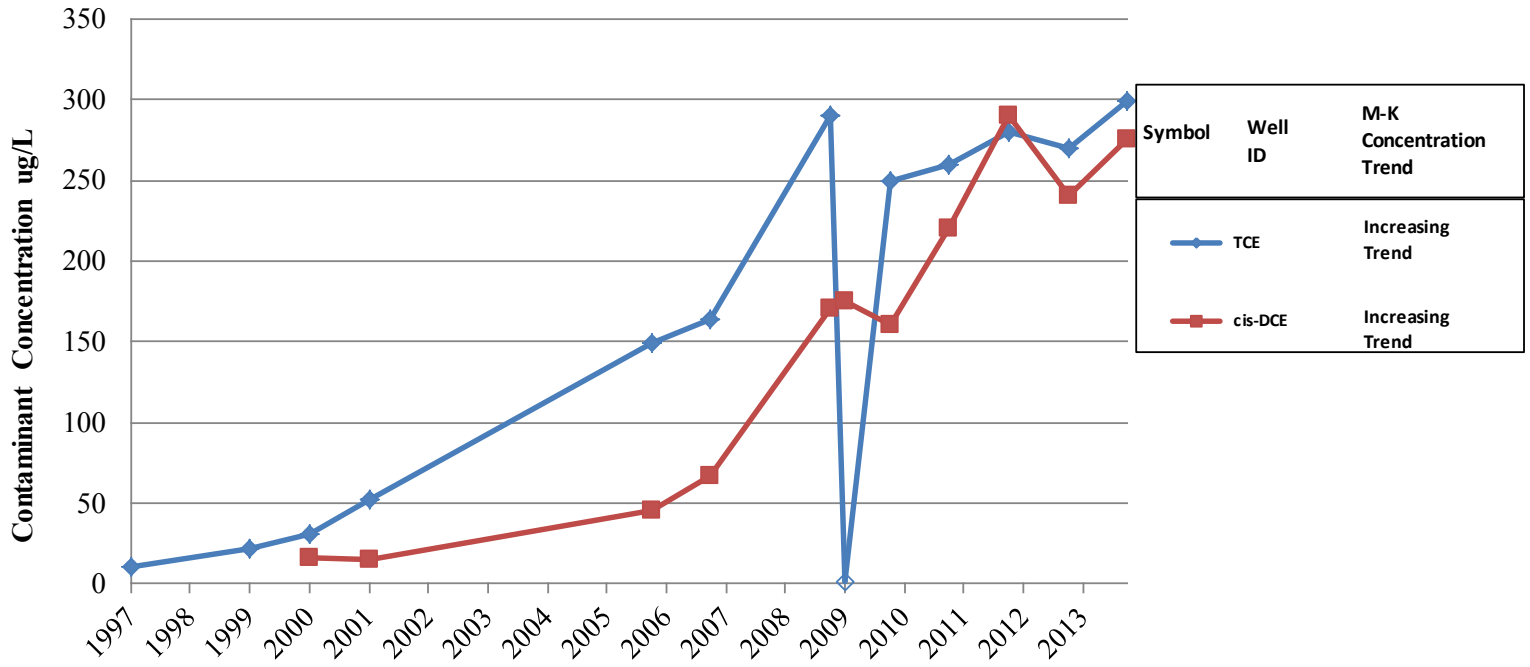


DP098 CONTAMINANT TRENDS IN 41755WL-05

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Graph **2-5**

Graph 2-6 DP098 Contaminant Trends in Well 41755WL-08



DP098 CONTAMINANT TRENDS IN 41755WL-08

Graph **2-6**

2014 Annual Field Activities Report, CERCLA Sites
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3.0 FT023

PBC Performance Objectives: Site Closeout

Anticipated Achievement Date: 2019

3.1 SITE DESCRIPTION

JBER-E Site FT023 consists of two small plumes west of the North/South Runway between Airlifter Drive and 33rd Street (Figure 3-1). The FT023 plumes are also referred to as the Fire Training Area Plumes. Groundwater contamination at this site has been attributed to two source areas: leaking USTs and a possible upgradient unknown source area (comprising the southern plume) and a bermed burning area (comprising the northern plume). A Phase I record search indicated that the drum storage area was used to store as many as 100 (one hundred) 55-gallon drums of contaminated waste oils, paint thinners, waste fuel, and waste solvents from aircraft maintenance and other shop operations (USAF, 1983). The exact location of the former drum storage area is unknown. Fire training activities were conducted in the bermed area from the 1940s to 1983. From the 1940s to the 1960s, combustible wastes, including oils, fuels, and solvents were used as fuel for the training exercises. Site FT023 was included in the OU4 investigation and cleanup.

3.1.1 Geology and Hydrology

Site FT023 is located on the outwash plain in a developed portion of JBER. The ground surface is relatively flat, and the immediate vicinity of the site is either paved or built upon and includes limited grassy areas. Boring logs from FT023 and adjacent areas show that the soils consist primarily of gravelly, silty sand, with some cobbles extending to at least 60 feet bgs, which is the deepest boring on the site. Regionally, fine-grained sediment of the Bootlegger Cove Formation underlies the outwash deposits.

Depth to groundwater at FT023 is between 44 ft bgs and 48 ft bgs. Groundwater levels are interpreted to vary seasonally between approximately 40 and 44 feet bgs. High water events are generally associated with spring break-up and late summer and/or autumn precipitation events. The seasonal low water level typically occurs in mid- to late winter. The groundwater flow direction at the site is toward the south-southwest. The hydraulic conductivity at FT023 is estimated to range from approximately 10^{0} to 10^{-3} centimeters per second (cm/sec), based on the soil textures and measured hydraulic conductivities in the JBER-E outwash soils.

The shallow groundwater at the site is not used as a drinking water source, with institutional controls imposed upon the area under the OU4 ROD. The nearest JBER water supply well (Well 29) is located approximately one mile west of the site.

3.2 REGULATORY REQUIREMENTS

The OU4 ROD (USAF, 1995b) identified COCs for groundwater as chlorinated solvents 1,1,1-trichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, PCE, TCE, and cis-1,2-dichloroethene. Fuel hydrocarbon benzene is also listed as a groundwater COC in the ROD. In 2010, corrections were made to some of the groundwater cleanup levels in a memorandum to the site file (USAF, 2010b). The diesel-range organics (DRO) and gasoline-range organics (GRO) were identified as COCs in the ROD for soil at FT023. DRO and GRO cleanup levels stated in the ROD are 2,000 and 1,000 milligrams per kilogram (mg/kg), respectively.

Current monitoring requirements at FT023 include periodic groundwater sampling and an annual LUC inspection. Groundwater sampling is required for the above COCs at groundwater monitoring wells OU4MW-11 (every five years), and 407MW-01 (annually). One field duplicate sample was collected from well OU4MW-11. Monitoring well OU4MW-11 will be sampled again in 2019 and 407MW-01 will be sampled in 2015. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

Annual groundwater sampling occurred at former bermed fire training pit, part of the North Fire Training Area Plume, until 2011. The northern plume was removed from annual sampling after three successive years of measuring COC concentrations below cleanup levels

3.3 2014 FIELD ACTIVITIES

During 2014, soil and groundwater samples were collected for separate treatment and investigation activities. The limited site investigation (LSI) used 2014 data with historical data to better delineate the nature and extent of chlorinated aromatic hydrocarbon contamination in groundwater, in order to optimize the process of advancing FT023 towards site closure. Field parameters collected during the 2014 event are presented in Appendix A. The 2014 and historical results are presented in Figure 3-1 and Appendix C. Analytical results from this investigation are presented in Table 3-1. Recommendations of the LSI are presented in the *Limited Site Investigation Report FT023 (Fire Training Area)* (USAF, 2015b).

Table 3-1 Summary of 2014 Analytical Results at FT023

Analyte	Cleanup Level[1] (µg/L)	GW-5A	OU4MW-11	OU4MW-11 (FD)
1,1,1-TCA	200	6.99	33.9	32.5
1,1-DCE	7	ND [0.500]	0.96 J	1.15
1,2-DCA	5	ND [0.250]	ND [0.250]	ND [0.250]
PCE	5	3.1	**18**	**16.9**
TCE	5	**33.2**	**14.9**	**15**
cis-1,2-DCE	70	38.4	**110**	**109**
Benzene	5	0.59	1.23	1.23

Table 3-1 Summary of 2014 Analytical Results at FT023 (Continued)

Notes:

[1] Cleanup levels as cited in the OU4 ROD (USAF, 1995b) and 2010 Final *Memorandum to the Site file, Elmendorf Air Force Base, Operable Units (OUs) 1,2,4, and 5* (USAF, 2010b).

µg/L = micrograms per liter
DCA = dichloroethane
TCA = trichloroethane
TCE = trichloroethene
PCE = tetrachloroethylene
ND = non-detect (limit of detection)
DCE = dichloroethene
FD = field duplicate
Bold result exceeds cleanup level.

Mann-Kendall trend tests show that there are statistically significant decreasing trends at the 95% confidence level for benzene, PCE, TCE, and cis-1.2-DCE in well OU4MW-11. Contaminant concentration trends for contaminants currently above their OU4 ROD cleanup level in well OU4MW-11 are shown on Graph 3-1. Appendix C presents all Mann-Kendall results and historical data.

A LUC inspection was performed at FT023 on 16 September 2014 and did not identify any issues. A copy of the 2014 LUC inspection form for Site FT023 is provided in Appendix B.

3.4 SITE SUMMARY AND RECOMMENDATIONS

A groundwater sample collected in 2014 from an in-source monitoring well, OU4MW-11, in the southern plume, had PCE, TCE, and cis-1.2-DCE above the OU4 ROD cleanup level.

3.4.1 Five-Year Review

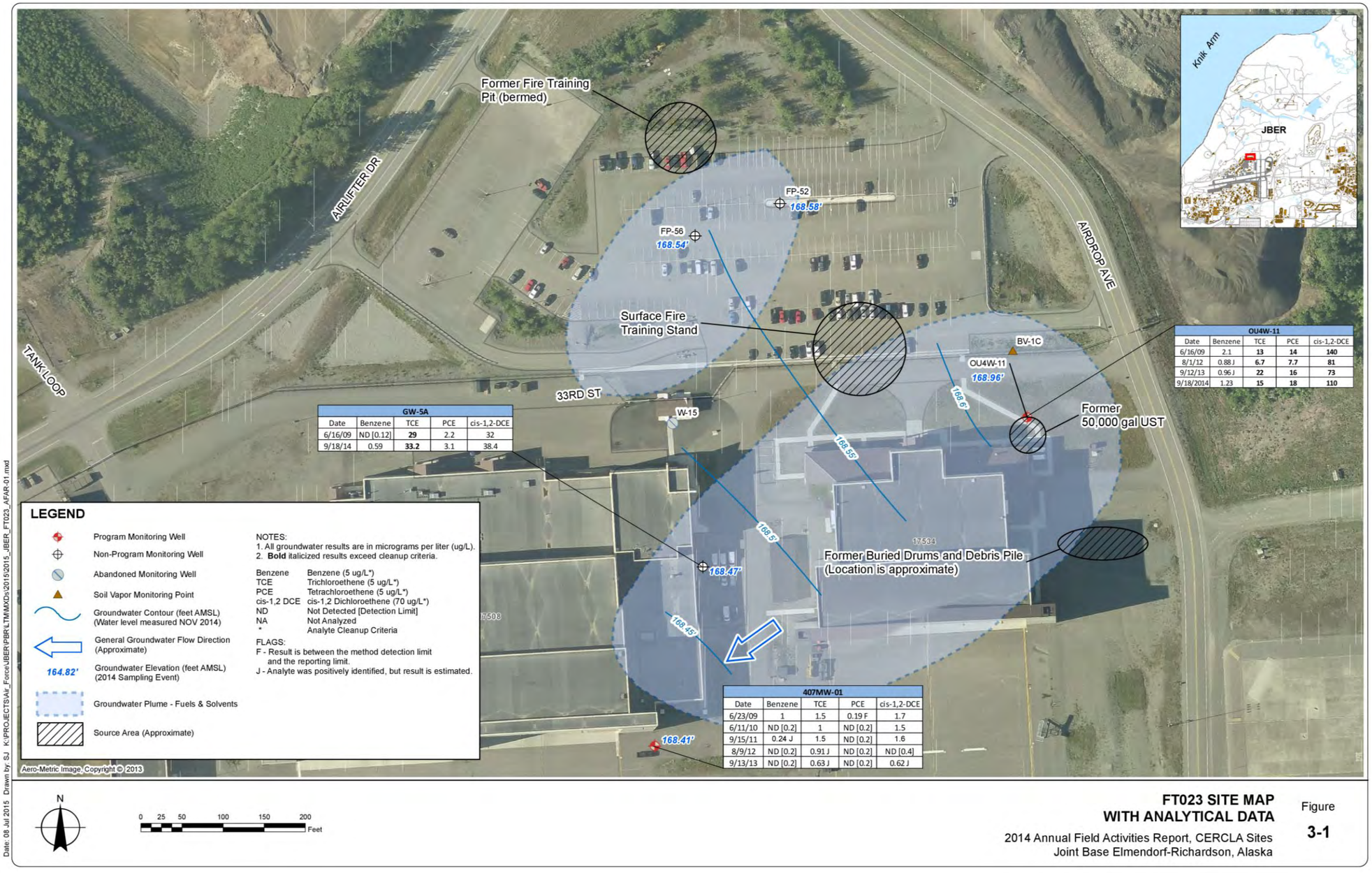
Areas in OU 4 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for FT023 documented during the first and second five-year review period (USAF, 1998c; USAF, 2003c).The third five-year review report recommended updating 1,2-dichloroethane, PCE, and TCE groundwater cleanup levels to be consistent with the referenced standards (USAF, 2008c). The fourth five-year review report recommended that a sampling event be conducted to identify if concentrations of 1,4-dioxane exist and determine whether or not there is an unacceptable risk at the site. Sampling of GW-5A was also recommended, as well as conducting a vapor intrusion evaluation in accordance with EPA guidelines for each occupied facility that is in proximity to the volatile organic compound (VOC) Plume (USAF, 2014e).

3.4.2 Recommendations

Site FT023 is identified as a **Yellow** priority since the plume continues to have concentrations of PCE, TCE, and cis-1.2-DCE above the OU4 ROD cleanup level. The milestone date for the vapor intrusion evaluation is 2016. The LSI recommended additional work be conducted to better delineate the extent of the chlorinated solvent contamination by installing a downgradient groundwater monitoring well and collecting soil and groundwater samples for GRO, DRO, residual-range organics (RRO), and the entire SW8260 parameter list. The following text summarizes observations and recommendations for Site FT023:

- According to the Basewide Monitoring Program Well Sampling Decision Guide (USAF, 2006), if a plume is stable, insource wells should be sampled once every five years and downgradient wells should be sampled once every two years. The downgradient well GW-5A should be added to the LTM program and sampled once every two years in accordance with the Well Sampling Guide. The well will be sampled again in 2016.

Figure 3-1 FT023 Site Map with Analytical Data



FT023 SITE MAP WITH ANALYTICAL DATA

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Joint Base Elmendorf-Richardson, Alaska

Figure **3-1**

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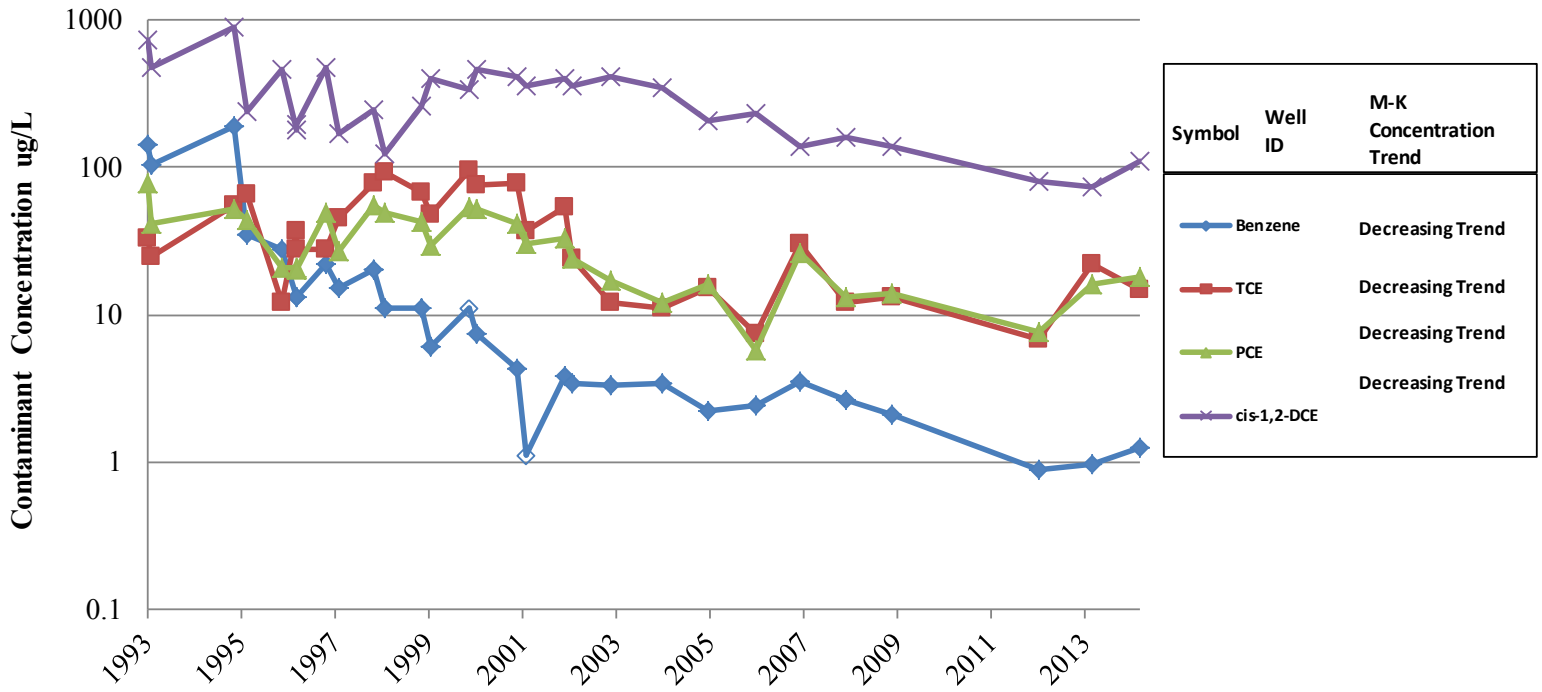
Graph 3-1 FT023 Contaminant Trends in Well OU4MW-11



FT023 CONTAMINANT TRENDS IN OU4MW-11

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Joint Base Elmendorf-Richardson, Alaska

Graph
3-1

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4.0 LF002

PBC Performance Objectives: Response Complete

Anticipated Achievement Date: 2018

4.1 SITE DESCRIPTION

JBER-E Site LF002 is an eight-acre landfill located north of the Boniface gate and west of Vandenberg Avenue (Figure 4-1). The landfill was reportedly active from 1940 to 1942, and aerial photographs demonstrated that activity ceased prior to 1950 (USAF, 1997b). Waste management practices of the era led to soil and groundwater contamination by metals, VOCs, and semi-volatile organic compounds (SVOCs). Groundwater was also contaminated by fueling and maintenance practices at a gun battery located upgradient of the site. The gun battery was inactivated and removed prior to 1950. By the time of the OU6 ROD (USAF, 1997b), no continuing source of groundwater contamination existed at the gun battery, and all gun-battery-derived contamination had migrated to the upgradient edge of the landfill. The landfill area is currently covered with several feet of soil and vegetation, capping heavy metals with soil was the selected remedy in the OU6 ROD.

4.1.1 Geology and Hydrology

Site LF002 sits on a late Quaternary glacial outwash deposit. Silt and peat deposits near the surface overlay sandy and silty gravels, which make up the matrix for a shallow aquifer. Groundwater flow through this aquifer is to the west-northwest, with a hydraulic gradient of approximately 0.008 ft/ft. Groundwater discharges into a large marsh 300 feet west of the landfill. Depth to water is typically 30 feet bgs with 50 feet of saturated thickness in the shallow aquifer.

Below the glacial outwash are the silt and clay units of the Bootlegger Cove Formation; this formation acts as an aquitard between the shallow unconfined aquifer and the deeper confined aquifer. The shallow aquifer is not currently used for any purpose, and future use is limited because of the higher yield of the confined aquifer (ROD for LF002, USAF, 1997b).

4.2 REGULATORY REQUIREMENTS

The only groundwater COC for LF002 is 1,1,2,2-tetrachloroethane (PCA). The cleanup level of 0.43 micrograms per liter (µg/L) presented in the OU6 ROD (USAF, 1997b) was amended by the OU6 ESD (USAF, 2007) to 4 µg/L. As of 2007, COC concentrations across the site were determined to be less than the cleanup level. The OU6 ROD states that when this condition is reached, the final round of groundwater monitoring will include analyses for all constituents that exceeded maximum contaminant levels (MCLs) during the 1994 investigation (USAF, 1996). In 2009, closure sampling was conducted at the site. All results were below cleanup levels.

Prior to determining “no further action” for groundwater, ADEC requested DRO and GRO analysis to be added for all sampling locations. Additional closure sampling was conducted in

2010, and the last round of closure sampling was conducted during 2011. In addition, ADEC requested the collection of total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) samples from the LF002 seep. In 2010, TAH and TAqH results were non-detect or below their applicable standards in the seep sample. In 2013, one more round of TAH and TAqH samples were collected in order to fulfill the requirements of the ROD (i.e., two consecutive clean rounds).

4.3 2014 FIELD ACTIVITIES

A LUC inspection was performed at LF002 on 18 September 2014. The inspection identified that groundwater well 53WL-05 is frost jacked and will require cutting and surveying. A copy of the 2014 LUC inspection form for LF002 is provided in Appendix B. No samples were collected.

4.4 SITE SUMMARY AND RECOMMENDATIONS

The 2009, 2010, 2011, and 2013 closure sampling combined with previous monitoring events indicates that the cleanup goals in the OU6 ESD have been met.

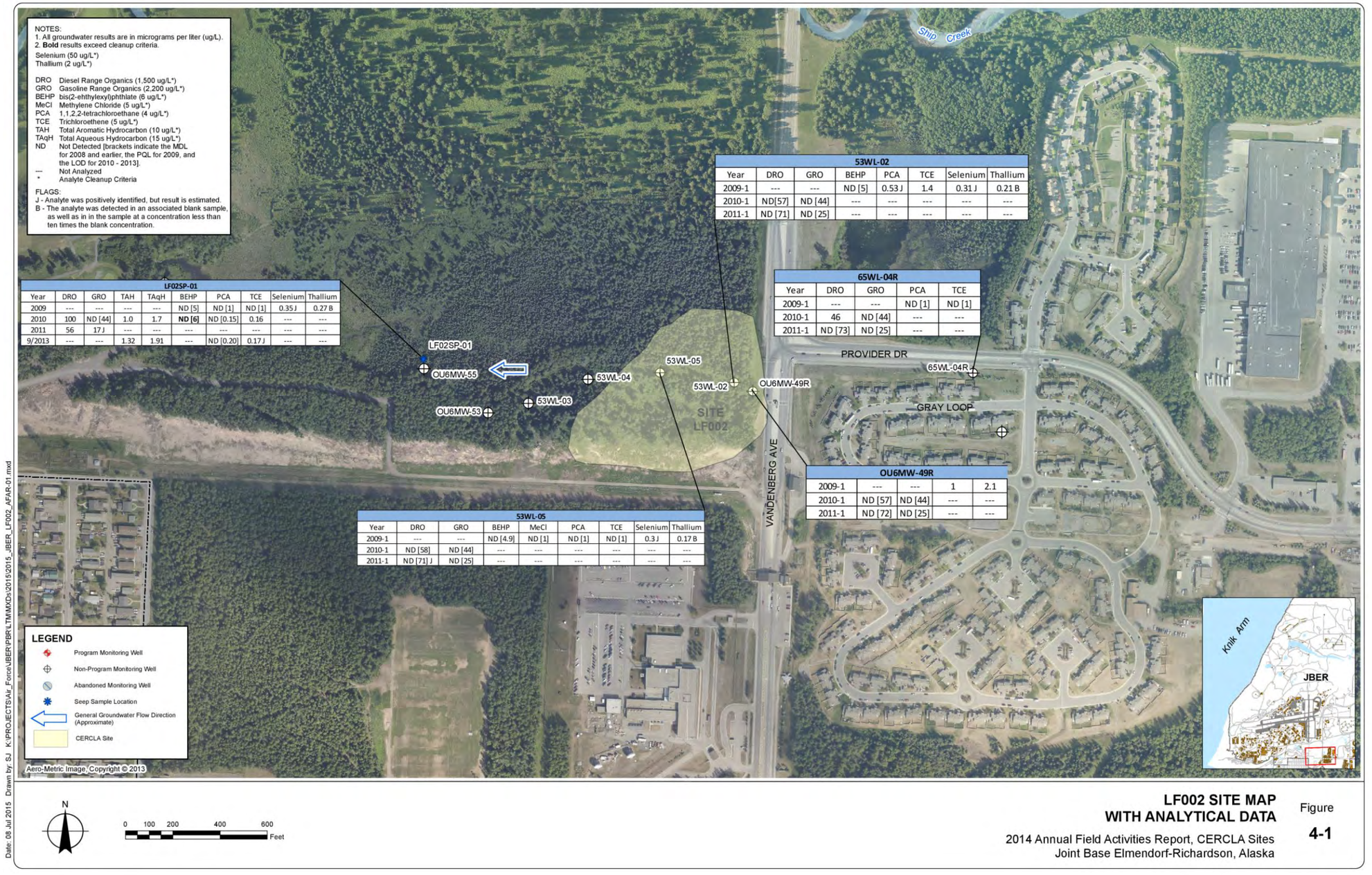
4.4.1 Five-Year Review

Areas in OU6 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for LF002 documented during the first and second five-year review period (USAF, 1998c; USAF, 2003c). The third five-year review report recommended one round of groundwater sampling for all contaminants of potential concern (COPCs) and preparation of a site closure report to document response complete for LF002 if groundwater met all cleanup levels (USAF, 2008c). The fourth five-year review report recommended continuation of sampling the LF002 seep for TAH/TAqH until the seep has been determined to meet closure requirements then prepare a memorandum to the site file documenting that groundwater and surface water meet cleanup levels and recommend a status of "Response Complete" for this site (USAF, 2014e).

4.4.2 Recommendations

Site LF002 is identified as a **Green** priority since the cleanup goals in the OU6 ESD have been met. It is recommended that the closure process be initiated for LF002 to include the preparation of an Interim Remedial Action Completion Report (I-RACR) and decommissioning of the four monitoring wells (OU6MW-49R, 53WL-05, 53WL-02, and 65WL-04R) associated with LF002. Although an I-RACR will be produced, ICs at this site will remain in place.

Figure 4-1 LF002 Site Map with Analytical Data



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5.0 LF003

PBC Performance Objectives: Response Complete

Anticipated Achievement Date: 2018

5.1 SITE DESCRIPTION

JBER-E Site LF003 is a 15-acre landfill located near the southwest corner of Provider Drive and Wilkins Avenue (Figure 1-1). Between 1943 and 1957, the landfill was used for disposal of general refuse, construction rubble, spent small arms ammunition from World War II, and small quantities of shop waste. No daily cover was applied and some limited open burning occurred during the 1950s. In 1957, due to subsequent odor and nuisance complaints, the landfill was closed and covered with several feet of native soil, which now supports a substantial growth of trees and shrubs.

5.1.1 Geology and Hydrology

LF003 sits on a late Quaternary glacial outwash deposit. Silt and peat deposits near the surface overlay sandy and silty gravels, which make up the matrix for a shallow aquifer. Groundwater flow through this aquifer is to the west-northwest with a hydraulic gradient of approximately 0.008 ft/ft. Depth to water is typically 30 feet bgs with 50 feet of saturated thickness in the shallow aquifer (USAF, 1997b).

5.2 REGULATORY REQUIREMENTS

The OU6 RI/FS found low levels of fuel constituents, VOCs, and metals in both soil and groundwater at LF003 (USAF, 1996). Metals results were evaluated and found to be at or near background concentrations in both soil and groundwater. Based on the concentrations of contaminants found during the RI, human health and environmental risk assessments were performed to determine if areas should be considered for remedial action. No COCs were identified for LF003.

The OU6 ROD required no further action at this site and LUCs were implemented (USAF, 1997b). This ROD was modified by the OU6 ESD (USAF, 2007), which clarified the USAF's implementation of LUCs at this site.

5.3 2014 FIELD ACTIVITIES

A LUC inspection was performed at LF003 on 26 September 2014 and did not identify issues. A copy of the 2014 LUC inspection form for LF003 is provided in Appendix B.

5.4 SITE SUMMARY AND RECOMMENDATIONS

No deficiencies were observed during the LUC inspection in 2014. LUC inspections will continue to be conducted annually in accordance with the OU6 ROD (USAF, 1997b).

5.4.1 Five-Year Review

Areas in OU 6 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for LF003 documented during the first five-year review period in 1998, the second five-year review in 2003, or for the third five-year review in 2008 (USAF, 1998c; USAF, 2003c; USAF, 2008c). For the fourth five-year review in 2014 all CERCLA sites, including LF003, were recommended for review and revision of site boundaries, if needed (USAF, 2014e).

5.4.2 Recommendations

Site LF003 is identified as a **Green** priority. No further remedial action is necessary and continuation of LUC inspections are recommended for this site.

6.0 LF004

PBC Performance Objectives: Design and Implement an Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

6.1 SITE DESCRIPTION

JBER–E site LF004 is a landfill (also known as the Knik Bluff Landfill) located west of the east-west runway extending approximately 3,000 feet (ft) along the Knik Arm bluff and is 600 ft wide (Figure 6-1). Between 1945 and 1957, the landfill was used as a surface dump for old cars, construction rubble, 55-gallon drums, and general refuse. Much of the waste was burned in place. The surface of the landfill is covered with soil and vegetation; however, tidal action along the base of the bluff has eroded the bluff face and exposed portions of the landfill, resulting in fill and waste material sloughing onto the beach. Expansion work at the Port of Anchorage conducted between 2006 and 2009 has filled most of the beach adjacent to LF004, eliminating tidal influence along the base of the bluff for most of the length of LF004. The rate of erosion and exposure of the landfill has been reduced.

In the OU6 ROD (USAF, 1997b), LF004 was divided into North/Beach and South sections. This ROD was modified by the OU6 ESD (USAF, 2007), followed by a memorandum to the site file. The LF04 Memorandum to the Site File (USAF, 2008a) removed reference to the beach area of LF004 North in acknowledgement of the Port of Anchorage Expansion. A subsurface seepage collection system and surface drainage swale were constructed at the base of the bluff.

The OU6 ESD gives the boundary between LF004 North/Beach and LF004 South as an east-west line through seep LF04SP-04. LF004 South encompasses the area south of the LF04SP-04 dividing line (Figure 6-1). The OU6 ROD (USAF, 1997b) refers to groundwater in this area as bluff groundwater and seep groundwater. Chlorinated VOCs monitored in the groundwater are attributed to past waste management practices. Fuel-related contaminants in the groundwater are attributed to leaking POL facilities such as PL081 and WP014. PL018 is a former 10" inactive pipeline that extended from the Port of Anchorage to the east end of the east/west runway that was damaged during the 1964 earthquake and abandoned in place. Site WP014 is a former fuel tank sludge disposal pit and fuel filter weathering location, which were located east of LF004 South. The general direction of groundwater flow in the vicinity of LF004 is southwesterly. Three aquifers are located in this area (USAF, 1996), complicating the site assessment and source history.

Site PL081 was not formally identified as a site until after the OU6 ROD was signed, and the PL081 DD states that groundwater contamination attributable to PL081 will be managed by the OU6 ROD (USAF, 2007).

LF004 South consists of two separate small plumes that are monitored by groundwater monitoring wells and seeps. Additionally, the WP014 plume extends across LF004 South and a mixing zone for LF004 South COCs occurs before the WP014 plume discharges at seeps LF04SP-03 and -04. Seeps LF04SP-03 and -04 are currently monitored for both LF004 South COCs and the WP014 plume COCs. The WP014 plume is now considered to be the primary influence for contamination in these seeps, and associated monitoring results are covered in Section 14.0, WP014.

Monitoring wells OU6MW-46 and OU6MW-63 and seeps LF04SP-02 and LF04SP-02DG have been previously associated with PL081. Results from these locations, except OU6MW-46, are discussed in this report with LF004 South results because they are monitored for LF004 South COCs, as stated in the OU6 ROD.

6.1.1 Geology and Hydrology

LF004 is located on the Elmendorf End Moraine, which predominantly contains clay-rich sections containing discontinuous lenses of sand and gravel (USAF, 1997b). These lenses form a complex hydrogeology which places a series of perched aquifers at varied depths. These are collectively called aquifer 1 and are typically 10-20 feet thick and 10-80 feet bgs. Groundwater flow in this aquifer is to the west at a gradient of approximately 0.018 ft/ft. A second aquifer is located about 70-110 feet bgs and is bounded above and below by a clay layer. It is also bounded in the west by the bluff and discharges as seeps along the bluff face. Aquifers 1 and 2 form a mixing zone at the eastern edge of LF004 and have similar gradients. On the western side, aquifer 2 steepens to about 0.133 ft/ft. The third aquifer is at or near the beach level. Groundwater flow in this aquifer is also to the west at a gradient of about 0.10 ft/ft. There is also a mixing zone in the west formed by water from aquifer 2 discharging as seeps on the bluff face entering aquifer 3 through the bluff soil. The two mixing zones allow for vertical hydraulic connectivity between the three aquifers estimated at 1.12E-3 to 3.59E-5 centimeters per second.

6.2 REGULATORY REQUIREMENTS

The basis for the cleanup level for all LF004 COCs is the OU6 ROD. The OU6 ROD identified COCs for groundwater as benzene, ethylbenzene, toluene, 1,2-dichloroethane (DCA), and methylene chloride (USAF, 1997b). Current remedial actions at LF004 include periodic groundwater and seep sampling, annual debris removal from the base of the bluff, and an annual LUC inspection. Groundwater sampling is required for the above COCs at groundwater monitoring wells OU6MW-61 (every five years), OU6MW-63 (every five years), and OU6MW-67 (every five years), the next annual sampling event will be conducted in 2016 for well OUMW-63 only. The sampling frequency for wells OU6MW-63 and OU6MW-67 was reduced in 2012 as recommended in the *2011 Zones 1, 2, and 3 Report* (USAF, 2012a). These recommendations were based on the sampling frequency matrix established in the OU6 Memorandum to the Site File (USAF, 2003d). Seep sampling is required for the above COCs at

seeps LF04SP-02 (annual) and LF04SP-02DG (annual). LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

6.3 2014 FIELD ACTIVITIES AND RESULTS

6.3.1 Debris Removal

The annual LF004 debris removal was conducted on 9 September 2014. WESTON personnel removed approximately 460 pounds of debris material consisting of metal scrap, household items, vehicle related debris, and construction related debris.

Prior to mobilization to the LF004 beach area, permissions were obtained with the Port of Anchorage and JBER security forces. Additionally, the JBER-E EOD technical staff performed a site walk with WESTON personnel prior to the beach debris removal. No items of concern were noted by the EOD staff as potential unexploded ordnance (UXO).

The geographic positioning system (GPS) locations were collected at the point of origin prior to removal and stockpiling into debris collection areas on 8 September 2014. On 9 September 2014, a second beach walk was performed and the debris piles were loaded into a work truck and delivered to the Municipality of Anchorage – Solid Waste Services landfill.

Since the Port of Anchorage expansion in 2007/2008 the quantity of debris recovered has steeply declined to levels below 0.5 tons. It is recommended to reduce the frequency of debris removal to once every 3 years based on the low levels of accumulation. A copy of the debris removal logbook, Solid Waste Services receipt, and a photograph log are included in Appendix A. Table 6-1 summarizes the debris quantities and types removed from 1997 to 2014.

6.3.2 Groundwater Sampling and LUC Inspection

During 2014, seeps LF04SP-02 and LF04SP-02DG and monitoring well OU6MW-67 were sampled. A field duplicate sample was collected from well LF04SP-02. Seeps LF04SP-03 and LF04SP-04 are sampled for site WP014, which is discussed in Section 14.0 of this report.

All samples were analyzed for VOCs. Benzene exceeded the ROD cleanup level in LF04SP-02 (17.0 µg/L) and OU6MW-67 (8.22 µg/L). Seep LF04SP-02 was also analyzed for polycyclic aromatic hydrocarbons (PAH) to calculate TAH and TAqH levels. The TAH and TAqH levels exceeded the 18 AAC 70 water quality standards at seep LF04SP-02. Analytical results for LF04SP-02DG were below cleanup levels. The 2014 and historical results are presented in Figure 6-1 and Appendix C. Table 6-2 presents 2014 analytical results.

Monitoring well OU6MW-67 is scheduled to be sampled every 2 years. In 2013 the well exhibited a benzene concentration of 5.2 µg/L after being below the cleanup level since 1999; therefore it was recommended that this well be sampled in 2014 even though the well was not due to be sampled until 2015. Results from 2014 showed an increase in the benzene concentration. Field parameters collected from this well are presented in Appendix A.

Mann-Kendall trend tests indicated statistically significant decreasing trends at the 95% confidence level for benzene, ethylbenzene and toluene in well OU6MW-67; however, this decrease is over 20 years, therefore it does not show the recent increase in benzene concentrations as statistically significant (Graph 6-1). Mann-Kendall trend test for benzene in seep LF04SP-02 shows no statistically significant trends. Appendix C presents Mann-Kendall and historical data.

A LUC inspection was performed at LF004 on 18 September 2014 and did not identify any issues. A copy of the 2014 LUC inspection form for LF004 is provided in Appendix B.

6.4 SITE SUMMARY AND RECOMMENDATIONS

Benzene concentrations at seep LF04SP-02 and monitoring well OU6MW-67 have increased and exceed the OU6 ROD cleanup level of 5 µg/L. Prior to 2014 concentrations at seep LF04SP-02 were been below the clean-up level and exhibited a decreasing trend for three consecutive years. Because of increased benzene and ethylbenzene concentrations the TAH and TAqH levels exceeded the 18 AAC 70 water quality standards in LF04SP-02. The downgradient seep (LF04SP-02DG) results have been below clean-up levels since 2002 indicating that benzene has not been migrating vertically.

6.4.1 Five-Year Review

Areas in OU6 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for LF004 documented during the first five-year review period in 1998, or for the second five-year review in 2003 (USAF, 1998c; USAF, 2003c). The third five-year review report recommended conducting groundwater monitoring and evaluation of LF004 South to determine if the area met the OU6 ROD cleanup levels and sampling of well OU6MW-61 to determine if LF004 South groundwater met cleanup levels for chlorinated solvent COCs (USAF, 2008c). The fourth five-year review report recommended performing a remedial process optimization for the LF004 South site to reevaluate the cleanup timeframe as well as a sampling event to identify if concentrations of 1,4-dioxane exist at the site and, if so, present an unacceptable risk. The review also recommended continuation with sampling LF004 seeps for TAH and TAqH to assess whether the seeps were meeting surface water quality standards. If the seeps are not meeting water quality standards, fuel-related compounds DRO and GRO in upgradient wells are to be analyzed to predict when and if the LF004 seeps will meet surface water quality standards (USAF, 2014e).

6.4.2 Recommendations

Site LF004 is identified as a **Yellow** priority. LF04SP-02 does not meet surface water quality levels and is recommended for quarterly sampling in accordance with the Well Sampling Decision Guide (USAF, 2006). Following recommendations from the fourth five-year review

upgradient well OU6MW-61 should be analyzed in 2015. It is also recommended that well OU6MW-67 be sampled in 2015 to determine if benzene concentrations persist above the cleanup level and show an increasing trend. In addition, it is recommended to reduce the frequency of debris removal to every three years based on reduction of debris accumulating since Port of Anchorage was expanded.

Table 6-1 LF004 Debris Removal Summary 1997-2014

Year	Quantity Removed (Tons)	Material Classification	Other Material Removed
1997	98	General debris, mostly metal	One roll of asbestos wrap, one large battery, two small transformers, 25 5-gallon drums and five 5- to 10-gallon drums with unknown contents
1998	25	General debris, recyclable material	No unexploded ordnance (UXO) or asbestos-containing material (ACM) identified
1999	29	General debris	No ACM identified; explosive ordnance disposal personnel removed small arms ammunition, shells, casings, and one howitzer shell casing
2000	12	Nonhazardous solid waste	No UXO or ACM identified
2001	34	Nonhazardous solid waste	No UXO or ACM identified; a cylinder with unknown contents was secured in place and left for the next field season
2002	18	Nonhazardous solid waste, mostly metal, some concrete, rubber, and vehicle parts	Forty rifle casings, one steel cylinder
2003	16.9	Nonhazardous solid waste, mostly metal, some rubber, electrical components, and wood	One .30- and one .50-caliber shell casing, 820 pounds of ACM (pipe)
2004	3.6	Nonhazardous solid waste, mostly metal, some rubber, electrical components, and wood	One previously perforated cylinder apparently containing seawater
2005	11.1	Nonhazardous solid waste, mostly metal, some rubber, electrical components, and wood	One .50-caliber shell casing, two compromised batteries, 40 pounds of asphaltic material, and 200 pounds of ACM (cementitious board and pipe)
2006	7.2	Nonhazardous solid waste, mostly metal, some rubber, electrical components, and wood	100 pounds of ACM (pipe), one light ballast (polychlorinated biphenyls [PCB])
2007	8.5	Nonhazardous solid waste, mostly metal, some electrical components, and wood	Pack of solder rod, a water heater, one lead battery, 120 pounds of ACM (cementitious board and pipe)
2008	0.14	Nonhazardous solid waste, mostly metal and glass	Small pieces of ceramic cookware
2009	0.15	Nonhazardous solid waste, mostly metal and glass	No UXO or ACM identified
2010	0.25	Nonhazardous solid waste, mostly metal, glass, and burned debris	No UXO or ACM identified
2011	0.42	Nonhazardous solid waste, mostly metal, glass, and burned debris	No UXO or ACM identified
2012	0.025	Nonhazardous solid waste, mostly metal scrap, household items, and a tire.	No UXO or ACM identified
2013	0.48	Nonhazardous solid waste, mostly metal scrap, glass, burned debris, household items and a porcelain sink basin.	No UXO or ACM identified
2014	0.23	Nonhazardous solid waste, mostly metal scrap, glass, burned debris, and concrete	No UXO or ACM identified

Notes:

ACM = asbestos-containing material PCB = polychlorinated biphenyl(s)

UXO = unexploded ordnance

Table 6-2 Summary of 2014 Analytical Results at LF004

Analyte	Cleanup Level[1]	LF04SP-02	LF04SP-02 (FD)	LF04SP-02DG	OU6MW-67
Benzene	5	**17.0**	--	ND [0.2]	**8.22**
Ethylbenzene	700	127	--	0.510 J	2.48
Toluene	1,000	ND [0.5]	--	ND [0.5]	ND [0.5]
1,2-DCA	5	ND [0.25]	--	ND [0.25]	ND [0.25]
Methyl ChlorideAcenaphthene	2,200	ND [2.5]0.0351	0.0242 J	ND [2.5]---	ND [2.5]-
Total aromatic hydrocarbons (TAH)[2]Acenaphthylene	102,200	**386.93332**ND [0.0281]	--ND [0.0279]	0.5102.67-	--
Total aqueous hydrocarbons (TAqH)[2]Anthracene	1511,000	**340.471395.49**ND [0.0281]	--ND [0.0279]	--	--
Benz(a)anthracene	1.2	ND [0.0281]	ND [0.0279]	-	-
Benzo(a)pyrene	0.2	ND [0.0281]	ND [0.0279]	-	-
Benzo(b)fluoranthene	1.2	ND [0.0281]	ND [0.0279]	-	-
Benzo(g,h,i)perylene	1,100	ND [0.0281]	ND [0.0279]	-	-
Benzo(k)fluoranthene	12	ND [0.0281]	ND [0.0279]	-	-
Chrysene	120	ND [0.0281]	ND [0.0279]	-	-
Dibenzo(a,h)anthracene	0.12	ND [0.0281]	ND [0.0279]	-	-
Fluoranthene	1,500	ND [0.0281]	ND [0.0279]	-	-
Fluorene	1,500	ND [0.035]	0.0304 J	-	-
Indeno(1,2,3-cd)pyrene	1.2	ND [0.0281]	ND [0.0279]	-	-
Naphthalene	730	8.12 J	6.93	-	-
Phenanthrene	11,000	ND [0.0281]	ND [0.0279]	-	-
Pyrene	1,100	ND [0.0281]	ND [0.0279]	-	-
Total aromatic hydrocarbons (TAH)	10	**386.93332**	--	0.5102.67	-
Total aqueous hydrocarbons (TAqH)	15	**340.471395.49**	--	-	-

Notes:

[1] Cleanup levels as cited in the OU6 ROD (USAF, 1997b)
[2]Water quality standards for total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) from 18 AAC 70.
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
Bold result exceeds cleanup level.
ADEC = Alaska Department of Environmental Conservation
ND = non-detect (limit of detection)
DCA = dichloroethane
µg/L = micrograms per liter
FD = field duplicate
TAqH = total aqueous hydrocarbons
TAH = total aromatic hydrocarbons

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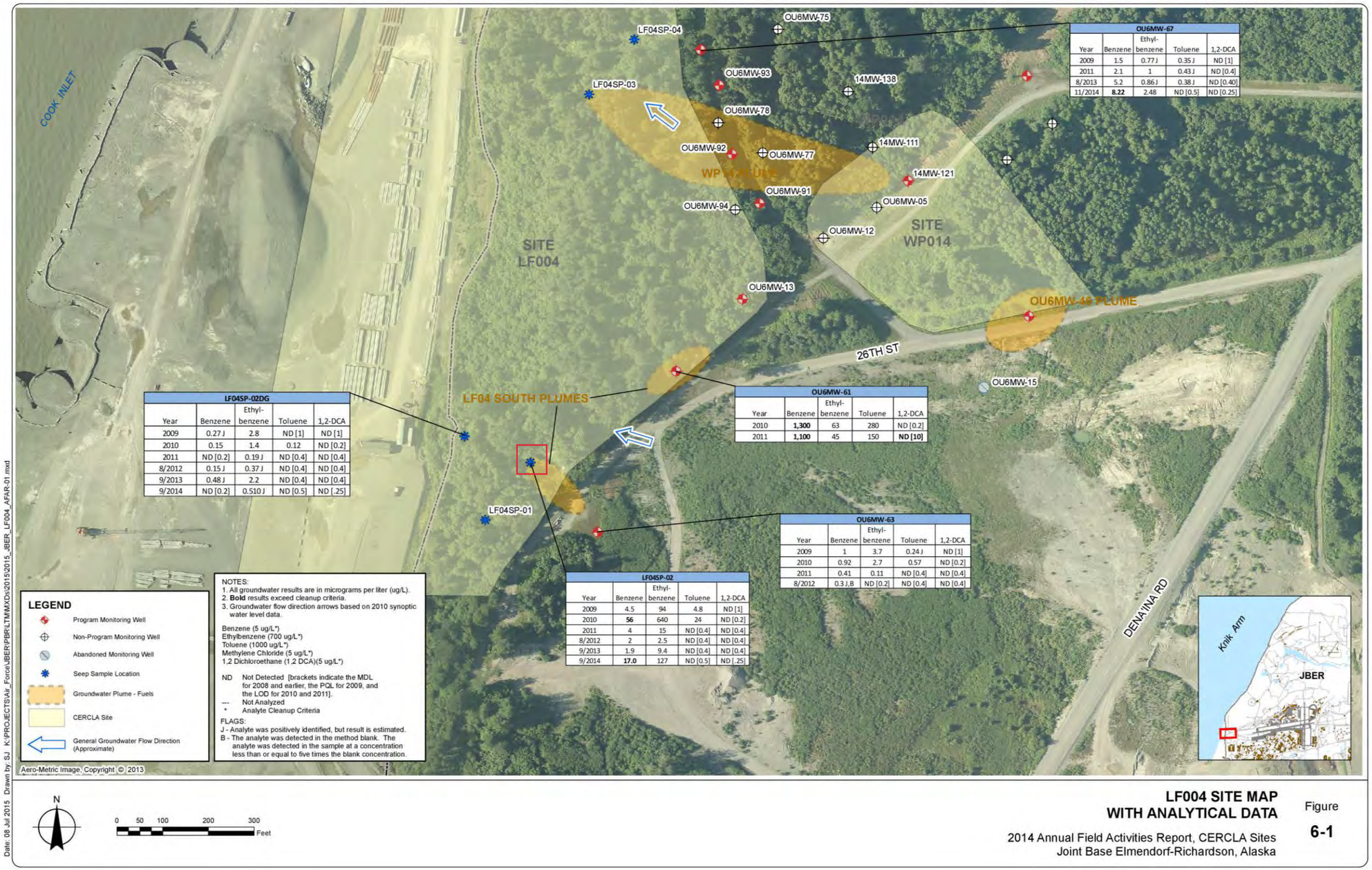
Figure 6-1 LF004 Site Map with Analytical Data



OU6MW-67				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2009	1.5	0.77 J	0.35 J	ND [1]
2011	2.1	1	0.43 J	ND [0.4]
8/2013	5.2	0.86 J	0.38 J	ND [0.40]
11/2014	**8.22**	2.48	ND [0.5]	ND [0.25]

LF04SP-02DG				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2009	0.27 J	2.8	ND [1]	ND [1]
2010	0.15	1.4	0.12	ND [0.2]
2011	ND [0.2]	0.19 J	ND [0.4]	ND [0.4]
8/2012	0.15 J	0.37 J	ND [0.4]	ND [0.4]
9/2013	0.48 J	2.2	ND [0.4]	ND [0.4]
9/2014	ND [0.2]	0.510 J	ND [0.5]	ND [.25]

OU6MW-61				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2010	**1,300**	63	280	ND [0.2]
2011	**1,100**	45	150	**ND [10]**

OU6MW-63				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2009	1	3.7	0.24 J	ND [1]
2010	0.92	2.7	0.57	ND [0.2]
2011	0.41	0.11	ND [0.4]	ND [0.4]
8/2012	0.3 J,B	ND [0.2]	ND [0.4]	ND [0.4]

LF04SP-02				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2009	4.5	94	4.8	ND [1]
2010	**56**	640	24	ND [0.2]
2011	4	15	ND [0.4]	ND [0.4]
8/2012	2	2.5	ND [0.4]	ND [0.4]
9/2013	1.9	9.4	ND [0.4]	ND [0.4]
9/2014	**17.0**	127	ND [0.5]	ND [.25]

LEGEND
- Program Monitoring Well
- Non-Program Monitoring Well
- Abandoned Monitoring Well
- Seep Sample Location
- Groundwater Plume - Fuels
- CERCLA Site
- General Groundwater Flow Direction (Approximate)

NOTES:
1. All groundwater results are in micrograms per liter (ug/L).
2. **Bold** results exceed cleanup criteria.
3. Groundwater flow direction arrows based on 2010 synoptic water level data.

Benzene (5 ug/L*)
Ethylbenzene (700 ug/L*)
Toluene (1000 ug/L*)
Methylene Chloride (5 ug/L*)
1,2 Dichloroethane (1,2 DCA)(5 ug/L*)

ND Not Detected [brackets indicate the MDL for 2008 and earlier, the PQL for 2009, and the LOD for 2010 and 2011].
--- Not Analyzed
* Analyte Cleanup Criteria

FLAGS:
J - Analyte was positively identified, but result is estimated.
B - The analyte was detected in the method blank. The analyte was detected in the sample at a concentration less than or equal to five times the blank concentration.

N

0 50 100 200 300 Feet

Date: 08 Jul 2015 Drawn by: SJ K:\PROJECTS\Ak_Force\JBER\PBR\LTMMXDs\2015\2015_JBER_LF004_AFAR-01.mxd

LF004 SITE MAP WITH ANALYTICAL DATA

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Figure **6-1**

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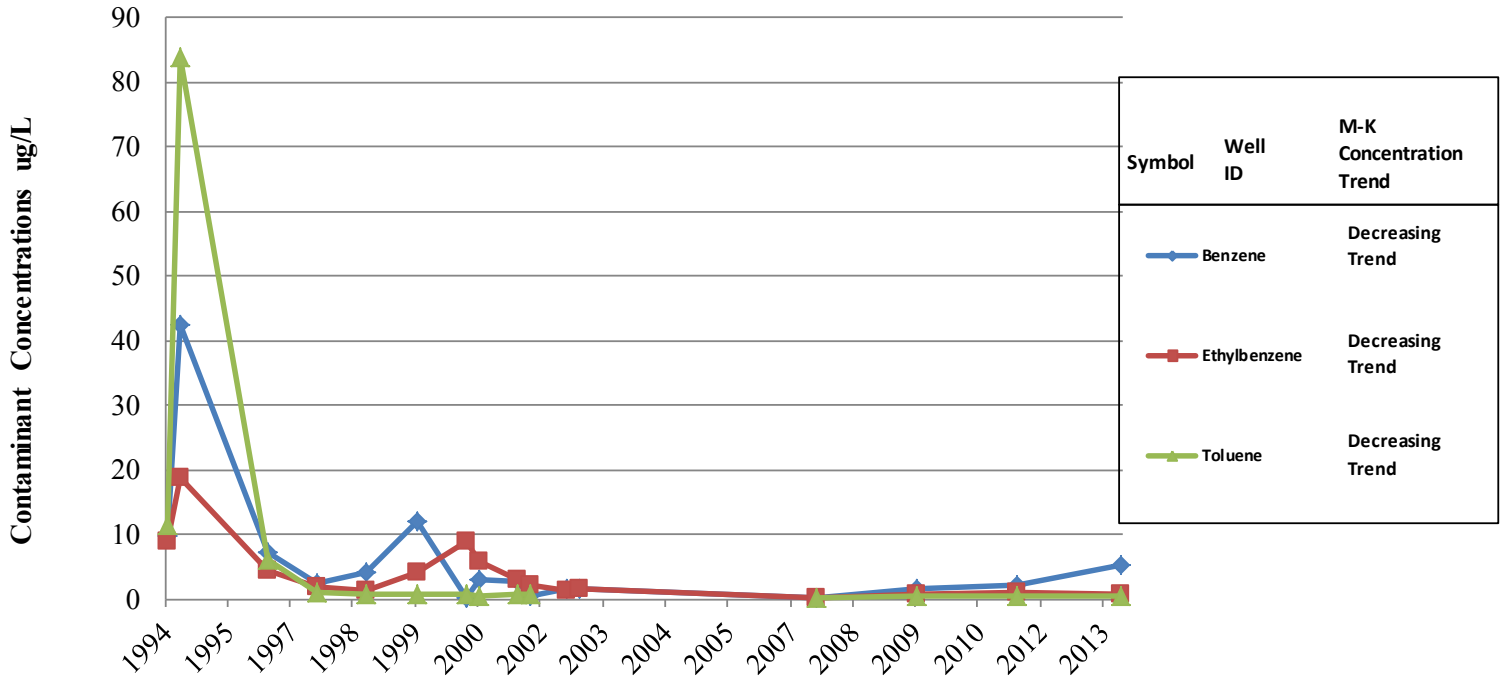
Graph 6-1 LF004 Contaminant Trends in Well OU6MW-67



LF004 CONTAMINANT TRENDS IN OU6MW-67

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Graph **6-1**

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7.0 LF059

PBC Performance Objectives: Response Complete

Anticipated Achievement Date: 2015

7.1 SITE DESCRIPTION

JBER-E Site LF059 occupies approximately one acre near the intersection of 1st Street and Vandenberg Avenue (Figure 7-1). The LF059 landfill received general refuse and construction debris from 1965 until 1983 and may have housed an asphalt batch plant in the 1950s and 1960s (USAF, 1994a). During a site visit in June 1991, "fluid asphalt" was observed pooled and partially solidified on top of a hiking trail. As a result, the trail was closed. The site was excavated in 1996, and over 10,000 gallons of asphalt were recovered and recycled. This site contains one plume, referred to as the LF59MW-03 plume.

7.1.1 Geology and Hydrology

Other than fill material, two lithologic units occur at the site, consisting of younger alluvial deposits adjacent to Ship Creek and older glaciofluvial deposits that underlie and extend beyond the limits of the alluvial deposits. The alluvial deposits generally consist of sand and gravel

The glaciofluvial deposits generally consist of massive to crudely bedded, poorly sorted, sandy gravel and include relatively thin lenses of sand. Channeling is common, and the gravel occurs as lenses and channel fill. There are also occasional lenses of finer-grained material.

The alluvial and glaciofluvial deposits are underlain at depth by the Bootlegger Cove Formation, a fine-grained glacioestuarine deposit generally consisting of clay, silt, fine sandy silt, silty fine sand, and minor amounts of sand. The depth to the Bootlegger Cove Formation is approximately 100 feet bgs. This unit forms the lower limit of the shallow aquifer and is the confining layer for for deeper, confined aquifer systems (USAF, 1994a)

Groundwater within the glaciofluvial deposits comprises a shallow, unconfined aquifer system in the region (USAF, 1994a). Historical groundwater elevation data indicate that groundwater flow across the LF059 area is predominantly to the west-southwest. The average horizontal groundwater gradient is about 0.0064 ft/ft, steepening to about 0.013 ft/ft near the western boundary of Site LF059 where groundwater discharges to Ship Creek (USAF, 1994a).

7.2 REGULATORY REQUIREMENTS

The basis for cleanup level for LF059 is the OU1 ROD which identified manganese, 1,2-dibromoethane, TCE, and VC as COCs in groundwater at the site (USAF, 1994a). TCE in groundwater is currently the only COC that remains above cleanup level (5 µg/L); however, the TCE plume at LF059 appears to be originating from an upgradient unknown source. Current monitoring requirements at LF059 include annual groundwater sampling and an annual LUC inspection. Annual groundwater sampling is required for TCE at groundwater monitoring wells

LF59MW-02 and LF59MW-03. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

7.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, groundwater monitoring wells LF59MW-02 and LF59MW-03 were sampled for VOCs. A field duplicate sample was collected from well LF59MW-02. Additionally, one seep sample was collected from LF59-09SEEP-SE and analyzed for VOCs. TCE analytical laboratory results exceeded the OU1 ROD cleanup levels in the field duplicate. Table 7-1 presents a summary of the results. Results are presented on Figure 7-1 and Appendix C.

The field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters pH, conductivity, DO, and ORP are included in Appendix A. Both monitoring wells LF59MW-02 and LF59MW-03 had DO less than 0.5 milligrams per liter (mg/L), indicative an anaerobic environment. TCE degrades more readily under anaerobic conditions than under aerobic conditions; however, the attainment of cleanup goals at this site is believed to occur due to other natural attenuation mechanisms including dispersion, adsorption, and dilution (USAF, 2012a). Appendix A presents field parameters for the LF059 site.

Mann-Kendall trend tests for TCE in wells LF59MW-02 and LF59MW-03 show no statistically significant trends.

A LUC inspection was performed at LF059 on 16 September 2014 and identified a missing cover, and lock from LF59MW-04, the outer casing is filled with water and is recommended for abandonment. In addition well LF59MW-05 is not labelled. A copy of the 2014 LUC inspection form for LF059 is provided in Appendix B.

Table 7-1 Summary of 2014 Analytical Results at LF059

Analyte	Cleanup Level[1] (µg/L)	LF59MW-02	LF59MW-02 (FD)	LF59MW-03	LF59-09SEEP-SE
TCE	5.0	4.96	**5.26**	4.37	2.29

Notes:
[1] Cleanup levels as cited in the OU1 ROD (USAF, 1994a)
TCE = trichloroethene
Bold result exceeds cleanup level
µg/L = micrograms per liter
FD = field duplicate

7.4 SITE SUMMARY AND RECOMMENDATIONS

The TCE concentrations were just below the OU1 ROD cleanup levels of 5 µg/L in the primary samples for monitoring wells LF59MW-02 and LF59MW-03 and exceeded the cleanup levels in the field duplicate.

7.4.1 Five-Year Review

Areas in OU 1 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for LF059 documented during the first five-year review period in 1998, or for the second five-year review in 2003 (USAF, 1998c; USAF, 2003c). The third five-year review report recommended incorporating data from upgradient wells LF05GW-2B and OU1LF-19 into the evaluation of natural attenuation and analysis of contaminant trends, and updating the conceptual site model for the TCE plume (USAF, 2008c). The fourth five-year review report recommended pursuing a "Response Complete" status for LF059, delineation of the upgradient plume affecting LF059 that may originate from closed site LF007, pursue reopening LF007 under CERCLA and the management of the groundwater plume that is affecting part of LF059 as part of the upgradient source. The review also recommended a sampling event be conducted to identify if concentrations of 1,4-dioxane exist and whether or not there is an unacceptable risk at the site (USAF, 2014e).

7.4.2 Recommendations

Site LF059 is identified as a **Green** priority. The TCE Contamination at the LF059 site appears to be coming from an upgradient source. A new CERCLA site has been opened (CG704) to investigate the potential upgradient source. A limited field investigation is planned for2015 or 2016. Pursuit of a "Response Complete" for LF059 is recommended. It is recommended that all groundwater sampling be discontinued at all monitoring wells and seeps in relation to site LF059. Monitoring wells at this site can be transferred to the new site and become program wells as appropriate.

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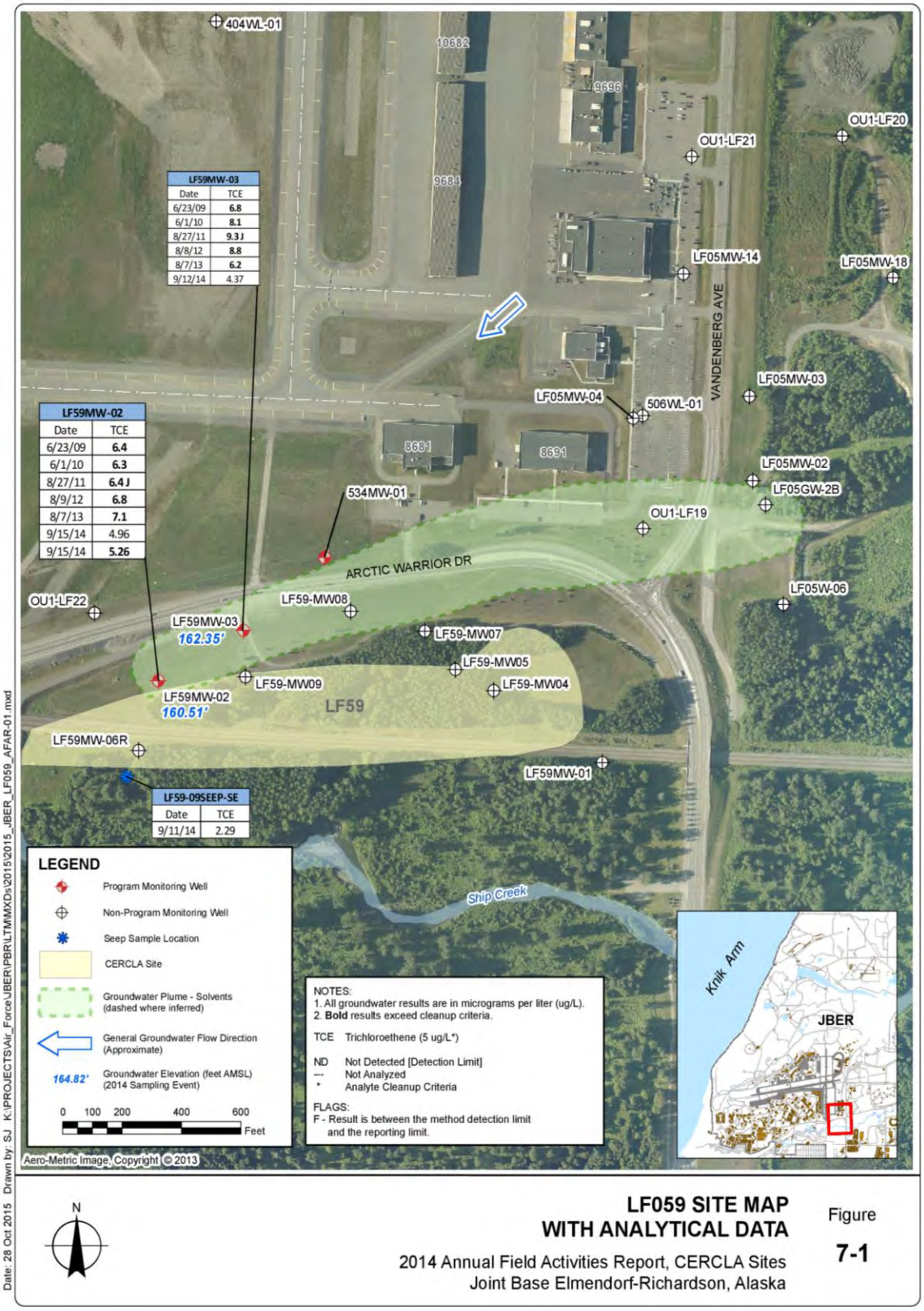
Figure 7-1 LF059 Site Map with Analytical Data



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8.0 SD015

PBC Performance Objectives: Design and Implement an Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

8.1 SITE DESCRIPTION

JBER-E Site SD015 historically consisted of four separate 30-ft by 50-ft concrete pads and the surrounding area. Two areas where concrete pads were demolished (Concrete Pads No. 2 and No. 3) are identified as contaminant source areas, shown on Figure 8-1. From the early 1970s to 1983, the concrete pads were used for weathering fuel filters and the disposal of tank sludge. This remote and undeveloped area was investigated as part of the OU6 ROD (USAF, 1997b).

Per the requirements of the OU6 ROD for Site SD015, a soil vapor extraction (SVE) system and a high-vacuum extraction (HVE) system were designed, installed, and operated for treatment of perched groundwater at this site. An ESD, which was signed by USAF in June 2007 and accepted by the EPA and the ADEC in August 2007, transitioned the remedy for the SD015 perched groundwater plume to MNA (USAF, 2007). In 2008, the HVE and SVE systems at SD015 were decommissioned. A LSI was conducted in 2011 during which soil contamination from solvents (TCE) was discovered at depths from 40 to 45 ft bgs. Additionally, analytical results from the 2011 LSI exceeded the ROD established cleanup levels for benzene and TCE in groundwater (USAF, 2012c). The current extent of contamination within the vadose and smear zone soils was only partially defined during the 2011 LSI. Groundwater contamination is confined to the small perched aquifer system. Currently, two monitoring wells are located at the site: OU6MW-17, and OU6MW-90.

8.1.1 Geology and Hydrology

Soil lithology to 60 feet bgs underneath SD015 was recorded from soil borings during the 2011 LSI. Surface soil at the site consists of 3 to 5 feet bgs of rich organic clay and silt. Below the surface soils, the lithology is fairly uniform brown sandy silt with a small amount of expanding clay and a moderate amount of pebbles. Thin discontinuous lenses of pure sands, clay, or cobbles occur down to 40 feet bgs.

The 1995 RI/FS for SD015 identified a perched groundwater aquifer and a deep confined aquifer system at the site. No further remediation was required for the deep aquifer at the time the ROD was signed. Dense, homogenous silt clay appears to act as an aquitard at 40 feet bgs (USAF, 2012a). The perched aquifer is approximately 10 to 20 feet thick (USAF, 1997b). Depth to groundwater is approximately 35 to 45 feet bgs as measured in monitoring wells.

8.2 REGULATORY REQUIREMENTS

The basis for cleanup level for SD015 is the OU6 ROD which identified seven COCs in perched groundwater at Site SD015. The COCs at SD015 are benzene, toluene, ethylbenzene, TCE, 1,2-DCA, 1,1,2,2-PCA, and 1,1,2-trichloroethane (USAF, 1997b). In 2007, the only COCs at site SD015 that did not meet cleanup levels were TCE and benzene. Current monitoring requirements at SD015 include annual groundwater monitoring and an annual LUC inspection. Annual groundwater sampling is required at groundwater monitoring well OU6MW-17 for TCE and benzene. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

8.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, groundwater monitoring well OU6MW-17 was sampled for VOCs. Analytical laboratory results for TCE (7.96 µg/L) and benzene (79.2 µg/L) exceeded the OU6 ROD cleanup level. Table 8-1 presents 2014 analytical results. The 2014 and historical results are presented on Figure 8-1 and in Appendix C.

The field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are included in Appendix A. Biogeochemical indicator parameters measured in the field indicate an anaerobic (reducing) environment at well OU6MW-17. These are typical at a POL plume undergoing biodegradation as aerobic bacteria degrade the POL contaminants and consume the available oxygen. The rate of petroleum hydrocarbon degradation under anaerobic conditions is slower than the rate typically observed in an aerobic environment. TCE readily degrades under anaerobic, reducing conditions. The biogeochemical environment at well OU6MW-17 is relatively conducive to anaerobic reductive dechlorination of TCE. Appendix A presents the field parameters for the SD015 site.

Well maintenance was performed in 2014 at one well, OU6MW-17. The well casing was cut down and resurveyed; in addition, the well cap was replaced

The Mann-Kendall trend test for TCE in well OU6MW-17 indicated a statistically significant decreasing trend at the 95% confidence level (Graph 8-1). No statistically significant trend was identified for benzene in well OU6MW-17.

A LUC inspection was performed at SD015 on 16 September 2014 and did not identify any issues. A copy of the 2014 LUC inspection form for SD015 is provided in Appendix B.

Table 8-1 Summary of 2014 Analytical Results at SD015

Analyte	Cleanup Level[1] (µg/L)	OU6MW-17
TCE	5	**7.96**
Benzene	5	**79.2**

Notes:
[1] Cleanup levels as cited in the OU6 ROD (USAF, 1997b).
TCE = trichloroethene
Bold results exceeds cleanup level
µg/L = micrograms per liter

8.4 SITE SUMMARY AND RECOMMENDATIONS

8.4.1 Five-Year Review

Areas in OU 6 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for SD015 documented during the first five-year review period (USAF, 1998c). The second five-year review report recommended modification to the existing HVE system configuration to include SVE in shallow soils, minimize vacuum to deep soils, and increase groundwater extraction and HVE wells that exceed remediation goals (USAF, 2003c). Consistent with the 2007 ESD the third five-year review report recommended an MNA remedy for the perched aquifer and use of trend analysis in order to evaluate the remedy and revise estimated dates for achieving cleanup levels (USAF, 2008c). The fourth five-year review report identified a decreasing trend for TCE but not benzene and recommended installation of a downgradient monitoring well to delineate plume boundaries (USAF, 2014e).

8.4.2 Recommendations

Site SD015 is identified as a **Yellow** priority since contaminant concentrations continue to exceed ROD cleanup levels but do not show an increasing trend. Following the recommendations of the fourth five-year review a new monitoring well should be installed downgradient of the site to better define plume boundaries.

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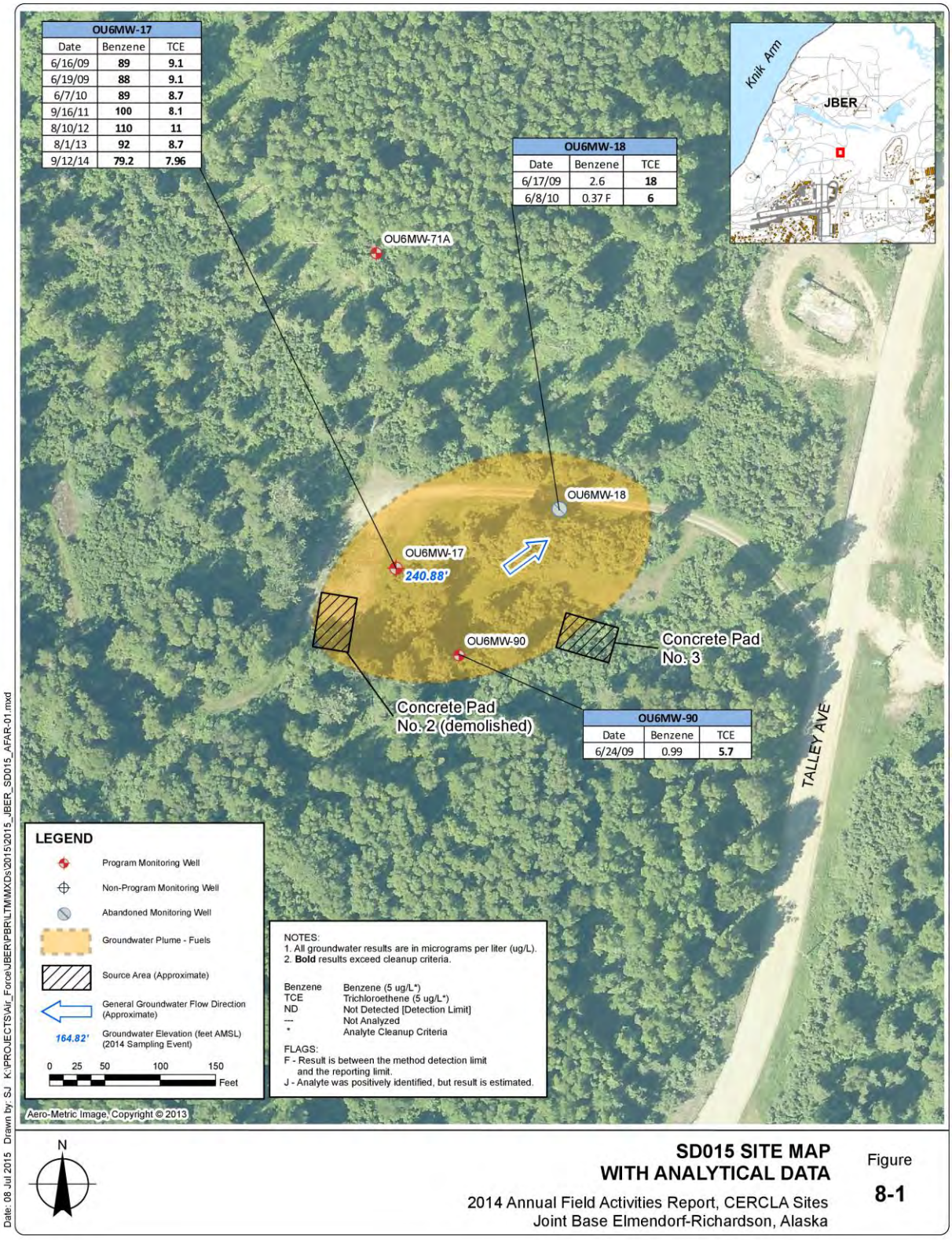
Figure 8-1 SD015 Site Map with Analytical Data



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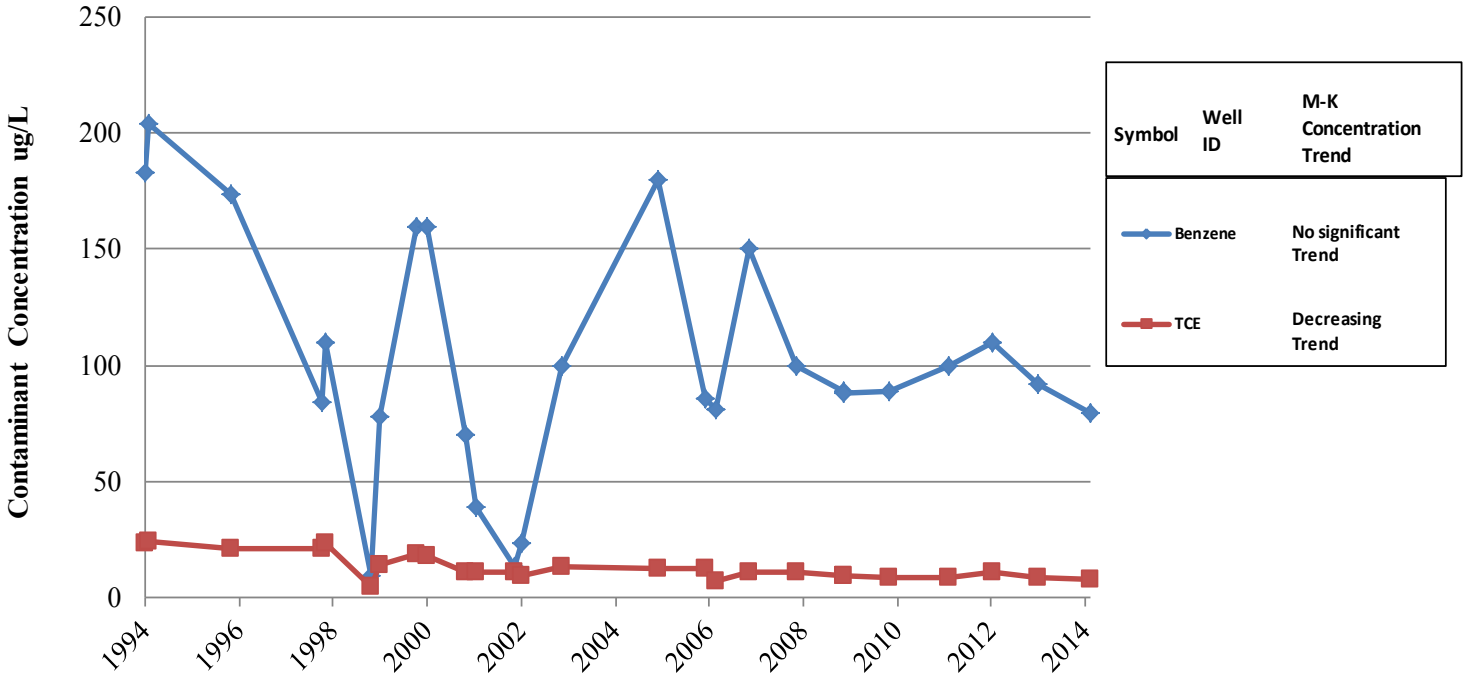
Graph 8-1 SD015 Contaminant Trends in Well OU6MW-17



SD015 BENZENE TREND IN OU6MW-17

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Graph
8-1

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9.0 SD024

PCB Performance Objectives: Site Closeout

Anticipated Achievement Date: 2015

9.1 SITE DESCRIPTION

Site SD024 consists of one groundwater plume (OU4MW-04 Plume) located north of the East/West Runway (Figures 9-1). The OU4MW-04 plume was formerly referred to as the Hangar 10 Plume. Hangar 10 (Building 15455) was used for fuel-loading operations. Potential sources of contamination identified in the RI/FS included a UST and pump house southwest of the Hanger 10 building and a POL system near Hangar 10. However, uncertainties regarding the local groundwater flow direction in the vicinity of site SD024 suggest that there may be a source area for this plume completely unrelated to Hangar 10.

Site SD024 was part of the OU4 investigation. A ROD was signed for OU4 in 1995 (USAF, 1995b). Currently, one groundwater monitoring well, OU4MW-04, is located at the site.

9.1.1 Geology and Hydrogeology

SD024 is part of OU4 West and is situated on glacial outwash and alluvial deposits, which consist of sands with varying amounts of gravel and silts. Sand with silt and gravel units comprise the upper 10 to 20 feet of the aquifer and are underlain by gravel and sand units approximately 10 to 50 feet thick. The saturated interval marking the top of the unconfined aquifer varies from approximately 30 feet below surface down to 60 feet below surface. The saturated interval is approximately 50 feet thick. The shallow, unconfined aquifer in this area overlies the Bootlegger Cove Formation. The formation consists of interbedded silts and clay deposits at depths approximately 30 to 125 feet below ground level. The average thickness of the formation in this area is approximately 50 feet. The structural surface of the formation is irregular. Within OU 4 West, the top of the Bootlegger Cove Formation is deepest in the vicinity of FT023 (at approximately 100 feet below ground surface) and near Hangar 14 (at 105 feet below ground surface). Further toward the southwest, the formation becomes shallower. At Hangar 8, this unit is at 39 feet below ground level (USAF, 1995b).

Groundwater flow direction is to the southwest, with a gradient of near 0.0013 ft/ft, increasing to 0.007 ft/fttowards Ship Creek. The shallow unconfined aquifer is not used for any purpose on base. Its future use is limited because of the higher yield of the deep, confined aquifer (USAF, 1995b).

9.2 REGULATORY REQUIREMENTS

The basis for cleanup levels at SD024 is the OU4 ROD which identifies benzene as the COC in groundwater at OU4 (USAF, 1995b). Current monitoring requirements at SD024 include an annual LUC inspection. The 2012 annual sampling marked the third consecutive year in which benzene concentrations were below the cleanup level at the site monitoring well OU4MW-04,

demonstrating that cleanup levels in ground water have been achieved. The site has met the remedial action objectives in the OU4 ROD and is recommended for site closure.

9.3 2014 FIELD ACTIVITIES AND RESULTS

A LUC inspection was performed at SD024 on 26 September 2014 and identified excavation activities for utility work had occurred at the site but did not identify any issues. The proper paperwork was in order for the utility excavation, dig permit # 242. A copy of the 2014 LUC inspection form for SD024 is provided in Appendix B.

9.4 SITE SUMMARY AND RECOMMENDATIONS

This section presents the results of the five-year review(s), site summary, and recommendations.

9.4.1 Five-Year Review

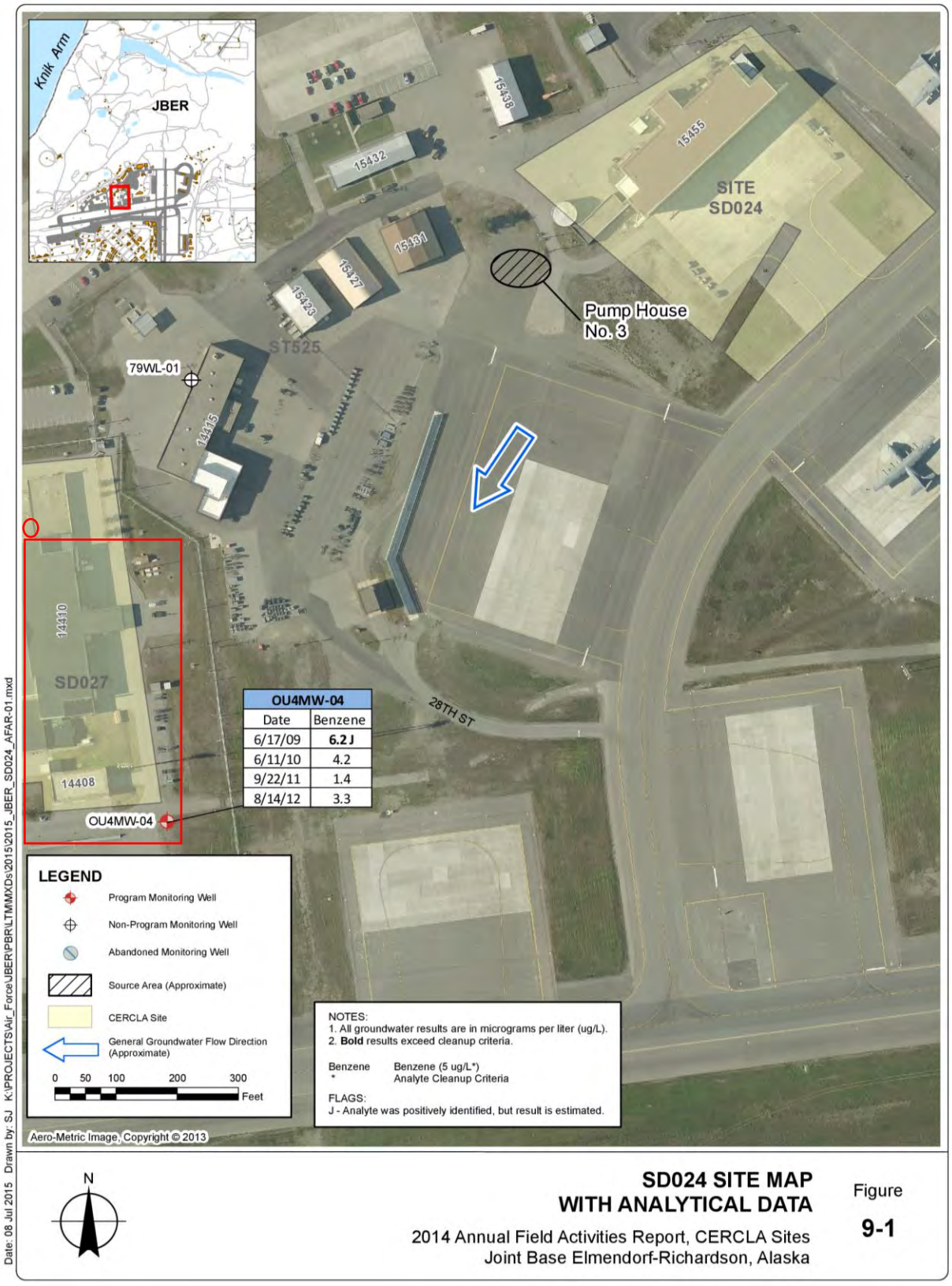
Areas in OU 4 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for SD024 documented during the first five-year review period (USAF, 1998c). Site SD024 groundwater results for benzene indicated intrinsic remediation was occurring. Consistent with the 2002 Annual Report (USAF, 2003e) and OU4 Memorandum to Site File (USAF, 2003f), the second five-year review report recommended decreasing the frequency of sampling at the in-plume monitoring well OU4MW-04 to once every five years (USAF, 2003c). The third five-year review report recommended increasing the frequency of sampling at monitoring well OU4MW-04 at Site SD024 to document attainment of cleanup levels (USAF, 2008c). The benzene concentrations reported in the 2010, 2011, and 2013 annual groundwater sampling events were less than the cleanup standard of 5 µg/L; therefore the fourth five-year review report recommended no further action for Site SD024 (USAF, 2014e).

9.4.2 Recommendations

The RA-Os at SD024 have been met and the site is scheduled to be closed. An I-RACR has been prepared to document that remedial action at Site SD024 has been completed and the RA-Os in the ROD (USAF, 1995b) have been met. It is recommended that annual LUC inspections continue until site closeout.

Site SD024 is identified as a **Green** priority since groundwater monitoring was discontinued in 2013 and the site has met the RA-Os as described in the ROD.

Figure 9-1 SD024 Site Map with Analytical Data



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10.0 SD025

PBC Performance Objective: Site Closeout

Anticipated Achievement Date: 2017

10.1 SITE DESCRIPTION

JBER-E Site SD025 consists of one groundwater plume (Hangar 11 Plume) in the north-central portion of Zone 2 north of the East/West Runway (Figure 10-1). Hangar 11 (Building 16430) is currently used for aircraft maintenance. Potential contaminant sources identified in the RI/FS included a series of USTs southwest of the hangar and valve pits west of the hangar. Site SD025 was included as part of the OU4 investigation and cleanup. A ROD was signed for OU4 in 1995 (USAF, 1995b). Between 1995 and 2003, a bioventing system operated at the site for the treatment of contaminated soil. Confirmation sampling performed in 2002 demonstrated that soil cleanup levels had been achieved. Currently, two groundwater monitoring wells, OU4MW-08R and 421MW-01, are located at the site. Results from these wells are used to track progress toward achieving groundwater cleanup levels.

10.1.1 Site Geology

SD025 lies on the relatively flat outwash plain south of the Elmendorf Moraine. The site soils consist primarily of gravelly sand, with silt and cobbles and occasional thin silty layers from ground surface to at least 55 feet bgs, which was the maximum depth of the investigation. The fine-grained soils of the Bootlegger Cove Formation underlie these sandy gravel outwash soils at depth. The site is underlain by two aquifers: a shallow water table aquifer and a deeper, confined aquifer. These aquifers are separated by the Bootlegger Cove Formation, which functions as a confining layer under most of JBER-E. There is no communication between shallow and deep aquifers in the area of investigation.

10.1.2 Site Hydrology

The nearest surface water, Triangle Lake, is located hydrologically upgradient approximately 0.82 miles northeast of SD025. The nearest downgradient surface water, Ship Creek, lies approximately 1.6 miles south of the site. No significant surface water runoff or sediment transport from the site was observed.

Groundwater levels are interpreted to vary seasonally between approximately 28 to 34 feet bgs. High water events are generally associated with spring break-up and late summer and/or autumn precipitation events. The seasonal low water level typically occurs in mid- to late winter. Groundwater measurements collected during the November 2014 groundwater sampling event indicate a southerly groundwater gradient and estimated flow direction at the site is toward the southwest. There is no current use of groundwater as a drinking water source at the site. The nearest JBER water supply well (Well 29) is located approximately 0.64 miles west of the site.

10.2 REGULATORY REQUIREMENTS

The basis for cleanup levels is the OU4 ROD which identifies benzene, ethylbenzene, and toluene as COCs in groundwater at OU4 (USAF, 1995b). Current monitoring requirements at SD025 include annual groundwater monitoring and an annual LUC inspection. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

Groundwater monitoring to assess contaminant migration and reduction of contaminant concentrations will be reviewed every five years to assess the protectiveness of the remedial action, as long as contamination remains above cleanup levels. Currently, benzene, ethylbenzene, and toluene levels remain above the cleanup levels. The current groundwater sampling program at SD025 includes sampling for benzene, ethylbenzene, and toluene annually at well OU4MW-08R.

10.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, groundwater monitoring well OU4MW-08R was sampled for benzene, toluene, ethylbenzene and total xylenes (BTEX). The concentration of benzene and toluene exceeded the OU4 ROD cleanup levels and concentrations of ethylbenzene were below cleanup level. Table 10-1 presents a summary of analytical results. The 2014 results and historical results are presented on Figure 10-1 and in Appendix C.

The field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are included in Appendix A. The results of biogeochemical indicator parameters measured from OU4MW-08R indicate an aerobic, reducing environment. According to the 2011 Annual Report (USAF, 2012a), although the rate of petroleum hydrocarbon degradation under anaerobic conditions is slower than the rate typically observed in an aerobic environment, degradation rates for benzene and other petroleum hydrocarbon constituents are often significant in anaerobic environments. Appendix A presents the field parameters for the SD025 site.

Table 10-1 Summary of 2014 Analytical Results at SD025

Analyte	Cleanup Level[1] (µg/L)	OU4MW-08R September 2014	OU4MW-08R May 2014
Benzene	5	**14.6**	**30**
Ethylbenzene	700	499	630
Toluene	1,000	**2,220**	**4500**

Notes:

[1] Cleanup levels as cited in the OU4 ROD (USAF, 1995b).
Bold result exceeds cleanup level.
J =the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
µg/L = micrograms per liter
ND = non-detection

Analytical laboratory results were above cleanup levels for all COCs from 2003 through 2012 in well OU4MW-08R. During 2013, concentrations of all three COCs in the well were below OU4 ROD cleanup levels, which is inconsistent with previous rounds of sampling. In 2014, benzene and toluene exceeded cleanup levels. The Mann-Kendall trend test for benzene in well OU4MW-08R indicated a statistically significant decreasing trend at the 95% confidence level (Graph 10-1). No statistically significant trends were identified for ethylbenzene or toluene in well OU4MW-08R. The 2013 groundwater results were excluded from the Mann-Kendall analysis because the data is considered anomalous and does not represent site conditions. Appendix C presents all Mann-Kendall data.

A LUC inspection was performed at SD025 on 19 September 2014 and did not identify any issues at the site. A copy of the 2014 LUC inspection form for SD025 is provided in Appendix B.

10.4 SITE SUMMARY AND RECOMMENDATIONS

In 2013, site characterization activities outside of annual LTM activities were conducted at the SD025 site to evaluate potential risks to human health and the environment in order to advance towards site closure. Results and recommendations from this report are presented in the *SD025 Site Characterization Report* (USAF, 2015c).

10.4.1 Five-Year Review

Areas in OU 4 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for SD025 documented during the first five-year review period (USAF, 1998c). The second five-year report recommended decommissioning and closure of the bioventing system at the site because residential soil cleanup levels had been reached (USAF, 2003c). The third five-year review report recommended updating DRO and GRO soil cleanup levels in the OU4 ROD to be consistent with the referenced standards and use of trend analysis in order to evaluate the remedy and revise estimated dates for achieving cleanup levels (USAF, 2008c). The fourth five-year review report recommended evaluation of alternative remedial strategies to accelerate the attainment of cleanup levels in groundwater and conduct a vapor intrusion evaluation for each occupied facility that is in proximity to the plume (USAF, 2014e). JBER is currently conducting a VI investigation, in which SD025 is included; results will be presented under a separate cover.

10.4.2 Recommendations

Site SD025 is identified as a **Yellow** priority because site COCs are above cleanup levels. There are no recommended changes to the current LTM approach for this site.

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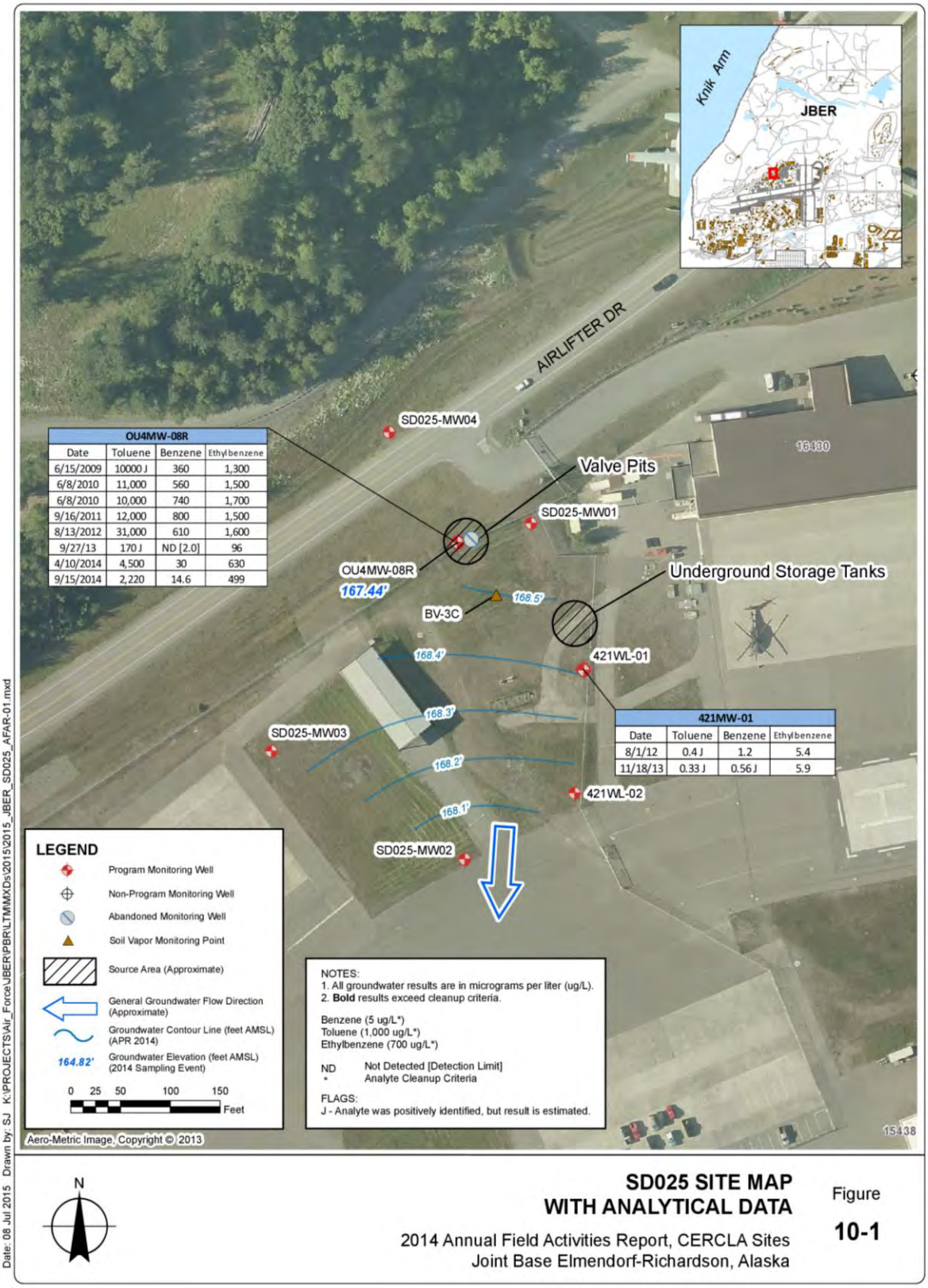
Figure 10-1 SD025 Site Map with Analytical Data



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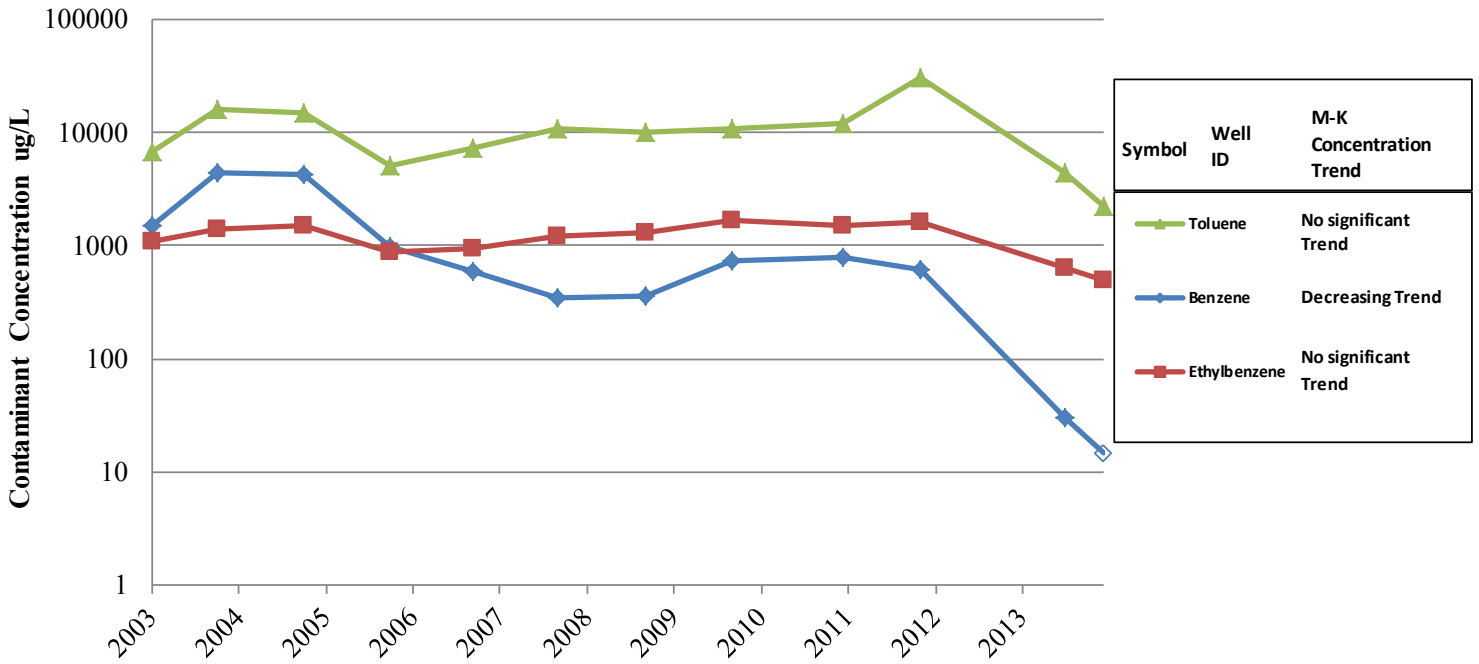
Graph 10-1 SD025 Contaminant Trends in OU4MW-08R



SD025 CONTAMINANT TRENDS IN OU4MW-08R

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Graph
10-1

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11.0 SD029

PBC Performance Objective: Site Closeout

Anticipated Achievement Date: 2019

11.1 SITE DESCRIPTION

JBER-E Site SD029 consists of one plume (OU4 East Plume) located between Taxiway F and Talley Ave. (Figure 11-1). Hangar 15, which is located east of the plume, was used for aircraft maintenance. The plume is located approximately 500 feet southwest of the F22 Weapons Release Shop (Building 16718) and Site SS109. Probable sources of contamination for the OU4 East Plume include a dry well, leach fields, pipelines, and valve pits east of Hangar 15. Site SD029 was investigated and a remedy implemented as part of the OU4 investigation and cleanup activities. A ROD was signed for OU4 in 1995 (USAF, 1995b).

11.1.1 Site Geology and Hydrology

Groundwater data indicates flow in a southwesterly direction at the site. The Groundwater is at approximately 55 to 58 feet bgs. Analysis suggests only a slight groundwater gradient to the southwest.

In December of 2010 a lithologic model of the subsurface soils at the site was performed (USAF, 2011a). Consistent with the regional geology, varying mixtures of cobbles, gravels, sands, and silts constitute the subsurface soils at the F-22 Weapons Release Shop site. Generally, the lithographic units found in the subsurface area of the site were characterized as well-graded, poorly-sorted and poorly-graded, well-sorted soils. The well-graded soil layers are characterized by a variety of soil grain sizes and the poorly-graded soil layers are characterized by uniform soil grain sizes.

Although the majority of the soils at the site are well-graded sands and gravels, several thin, discontinuous lenses of poorly-graded sand are also present at various depths. Cobbles and boulders are encountered at varying depths. Thin (less than 6 inches) lenses of fine-grained black organic material, similar to coal, were occasionally encountered in the borings. These organic lenses were observed in several borings at varied depths. Additionally, a 0- to 10-foot thick layer of silt-containing material (greater than 30 percent silt by volume) was encountered at 5 feet to 10 feet bgs.

The well- to poorly-graded sands and gravels can potentially act as a conduit, to some extent, for infiltrating water. In comparison, the soil layers containing significant fractions of silt or black organic material are considered likely to impede or redirect infiltrating water.

Seasonally frozen soils were encountered near the surface to depths up to 6 feet bgs during the exploration. It was estimated that seasonal frost could penetrate to depths of 8 feet bgs or more in areas of little or no snow cover during a cold winter (USAF, 2011a).

11.2 REGULATORY REQUIREMENTS

The basis for cleanup levels at SD029 is the OU4 ROD which identifies PCE and TCE as COCs in groundwater at SD029 (USAF, 1995b). Current monitoring requirements at SD029 include annual groundwater monitoring and an annual LUC inspection. LUCs are in place to prevent access and exposure to contaminated groundwater at the site. Institutional controls on land use will restrict access to the contaminated shallow soil through OU4 until cleanup levels have been achieved. The current groundwater sampling program at SD029 includes sampling for PCE and TCE annually at well IS6-01.

11.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, groundwater monitoring well IS6-01 was sampled for VOCs. The concentration for PCE was below the OU4 ROD cleanup criteria. The concentration for TCE exceeded the OU4 ROD cleanup criteria. Table 11-1 presents a summary of the results. Historical results are presented on Figure 11-1.

Field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are included in the 2014 Field Parameters JBER-Elmendorf, CERCLA Sites table in Appendix A. Biogeochemical indicator parameters measured from IS6-01 indicate a mildly aerobic environment. PCE and TCE do not readily degrade under aerobic conditions, which mean that attainment of cleanup goals at this site may have occurred due to other natural attenuation mechanisms including dispersion, adsorption, and dilution. Appendix A presents the field parameters for the SD029 site.

Table 11-1 Summary of 2014 Analytical Results at SD029

Analyte	Cleanup Level[1] (µg/L)	IS6-01
PCE	5	4.86
TCE	5	**6.53**

Notes:
[1] Cleanup levels as cited in the OU4 ROD (USAF, 1995b).
TCE = trichloroethene
PCE = tetrachloroethene
µg/L = micrograms per liter

The Mann-Kendall trend tests for PCE and TCE in well IS6-01 indicated statistically significant decreasing trends at the 95% confidence level (Graph 11-1). Appendix C presents all Mann-Kendall results.

A LUC inspection was performed at SD029 on 22 September 2014 and did not identify any issues at the site. A copy of the 2014 LUC inspection form for SD029 is provided in Appendix B.

11.4 SITE SUMMARY AND RECOMMENDATIONS

The PCE concentrations at well IS6-01 have been below the OU4 ROD cleanup level in annual sampling since 2009. The TCE concentration was below OU4 ROD cleanup level for the first time in 2013, but exceeded the cleanup level in 2014. Continued annual groundwater monitoring is proposed at well IS6-01 for this site until both COCs remain below OU4 ROD cleanup levels .

11.4.1 Five-Year Review

Areas in OU 4 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for SD029 documented during the first or second five-year review period (USAF, 1998c; USAF, 2003c). The third five-year review report recommended increasing the monitoring of well IS6-01 to annually to document the attainment of cleanup levels. The fourth five-year review report recommended that a sampling event be conducted to identify if concentrations of 1,4-dioxane exist and determine whether or not there is an unacceptable risk at the site ,as well as conducting a vapor intrusion evaluation in accordance with EPA guidelines for each occupied facility that is in proximity to the plume(USAF, 2014e).

11.4.2 Recommendations

The 2007 RPO evaluation identified Site SD029 as a **Green** priority site because the remedy was on track to reach the specified cleanup level by 2009 (USAF, 2008b). The PCE concentration at well IS6-01 has been below the 5 µg/L cleanup level since 2009. The TCE concentration at IS6-01 remains slightly above the cleanup level of 5 µg/L (Figure 3.14). TCE concentrations exhibit an overall decreasing trend with a relatively high R^2 (0.917). Therefore, the **Green** priority designation for SD029 remains appropriate.

Per the March 3, 2015 meeting with AFCEC, ADEC, EPA, and WESTON the sample frequency for SD029 may be increased to quarterly events in support of evaluating groundwater concentrations statistically. If the first 2015 quarterly sample shows an increase in concentration above the last analytical sample result, then the sample frequency will remain annual for this site. If the first quarterly sample for 2015 shows a decrease in concentration below the last analytical sample result, then quarterly sampling will continue.

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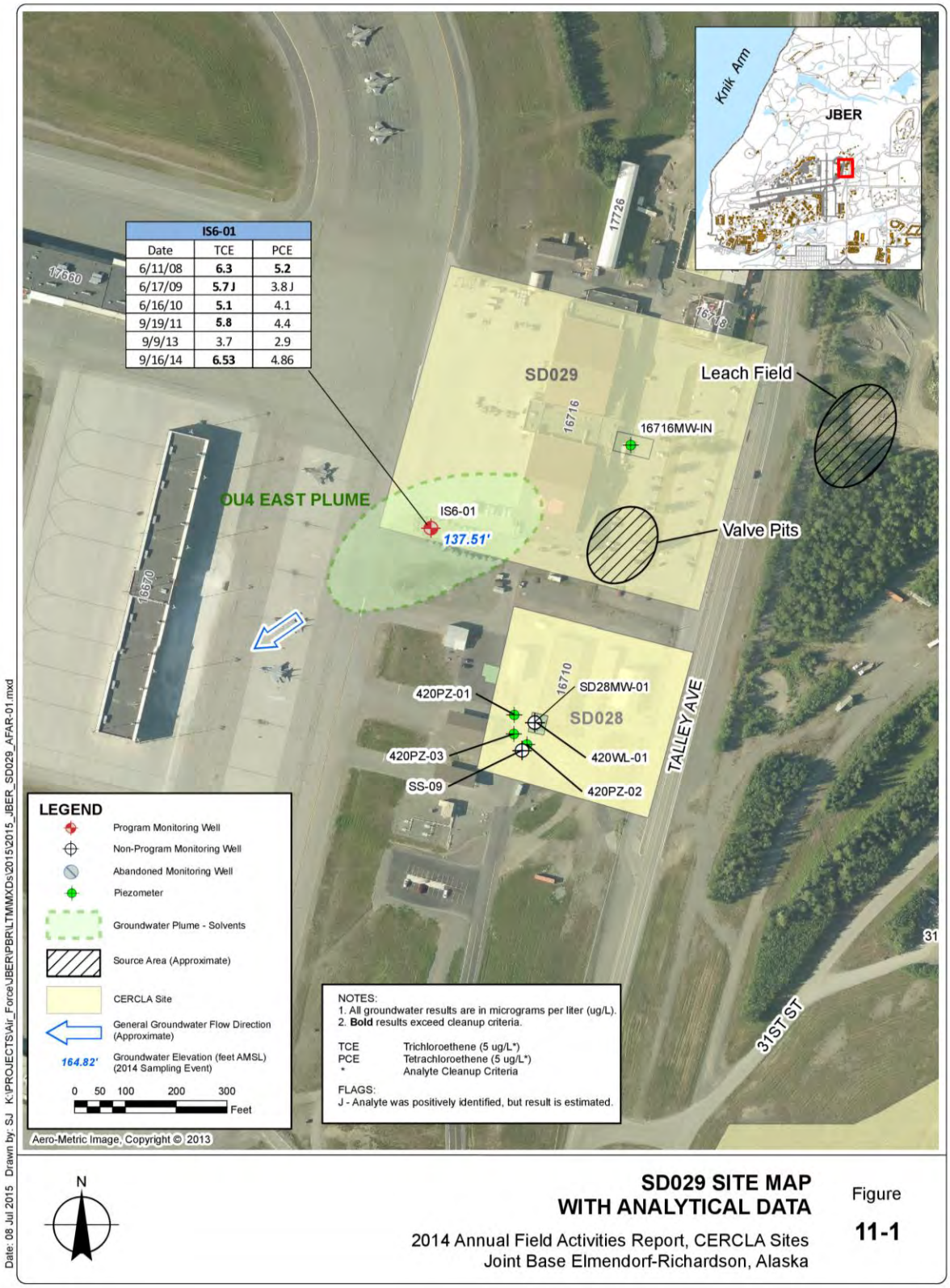
Figure 11-1 SD029 Site Map with Analytical Data



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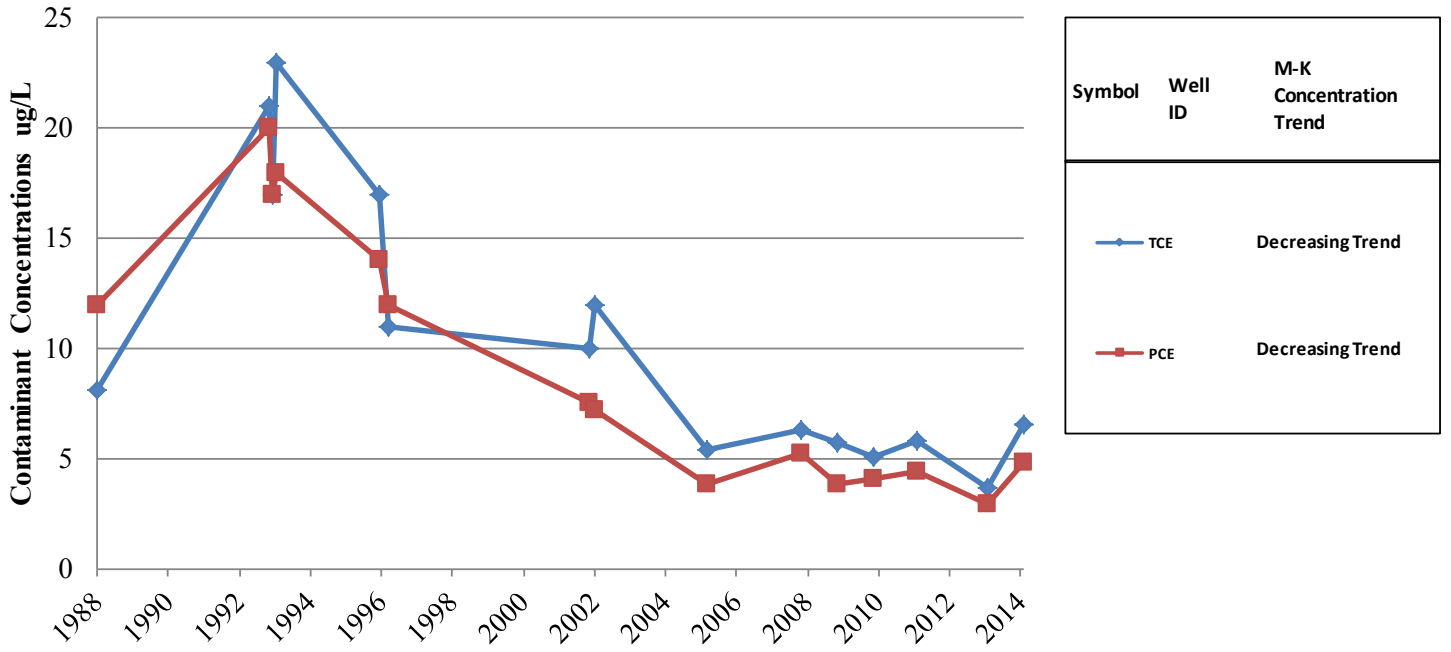
Graph 11-1 SD029 Contaminant Trends at IS6-01



SD029 CONTAMINANT TRENDS IN IS6-01

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Figure
11-1

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12.0 ST037

PBC Performance Objective: Design and Implement an Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

12.1 SITE DESCRIPTION

JBER-E Site ST037 was originally one of six fuel contamination source areas investigated during the OU5 RI/FS (USAF, 1994b). These sites were grouped together into one OU because of their proximity and similarities in the type of contamination. The original area identified as Site ST037 in 1990 lies at the southern perimeter of JBER-E, north of Ship Creek.

Between 1956 and 1958 a diesel fuel line broke approximately 600 ft north of Ship Creek. Fuel from the leaking pipeline reportedly seeped out of the ground near railroad tracks 200 ft south of the spill area. Thousands of gallons of fuel were recovered; however, an unknown amount remained below the ground surface.

Due to minimal soil contamination, the other sites - ST038, SD040, SS042, ST046, and SS053 were designated as no further action sites and RODs were signed in August 1994 (USAF, 1994b, c, d). During the RI/FS chlorinated solvents (primarily TCE) were detected in groundwater, but no source areas were identified. The original ST037 site was significantly expanded to include the areas underlain by chlorinated solvent plumes including: the Fairchild Avenue Plume, Kenney Avenue Plume, OU3MW-25 Plume, OU5MW-02 Plume, and SP1-02 Plume, Slammer East Plume and Slammer West Plume. Site ST037 is the only remaining active site within this operable unit (OU5), and encompasses both the remaining fuel and chlorinated solvent contamination.

In 2010, a TCE plume and source area groundwater investigation was completed at the ST037 site. Results from this investigation are presented in the *Draft Final ST37 TCE Plume and Source Area Investigation Report* (USAF, 2011b). The Fairchild Avenue Plume, Kenney Avenue Plume, OU3MW-25 Plume, OU5MW-02 Plume, and SP1-02 Plume were found to be comingled into a single plume with multiple lobes, which is now referred to as the Western ST037 Plume. The plumes now associated with Site ST037 include the Slammer Avenue Plumes and the Western ST037 Plume. Site ST037 also includes seeps and surface water sample locations near the southern boundary of JBER-Elmendorf, the wetland remediation system, and the Early Warning and Sentry Well Networks.

12.1.1 Geology and Hydrology

Because of its large areal extent covering a significant portion of the installation, over the majority of its footprint, ST037 is underlain by the sands and gravels of the Anchorage glacio-fluvial outwash plain as indicated in Section 1.3.1. Along the southern margin, it is underlain by the alluvial sands and gravels of the Ship Creek flood plain. The outwash deposits are underlain

by the Bootlegger Cove Formation at depths ranging from 50 to 80 feet bgs. Along the southwestern margin, a steep colluvium bluff leads to a broad, flat area that ends at Ship Creek, which flows from the east to west. In the southeastern margin, a gently sloping colluvium bluff leads to a wetland area referred to as "the beaver pond area" (Warhaftig, 1965).

As indicated in Section 1.3.2 describing the general JBER-E hydrogeology, ST037 is underlain by two aquifers: a shallow water table aquifer; and a deeper, confined aquifer, separated by the Bootlegger Cove Formation, which functions as an aquitard separating the shallow water table aquifer from the deeper, confined aquifer across most of JBER-E. Groundwater in the shallow aquifer generally flows south to southwesterly towards Ship Creek and ST037. The shallow aquifer consists primarily of sand and gravel that varies in thickness between 50 and 80 feet above the bluff, depending on local topography. Depth to water above the bluff is approximately 30 feet below ground surface (bgs), which translates to a saturated thickness in the upper aquifer that varies between 20 and 50 feet. In the Ship Creek alluvium at the base of the bluff, the depth to the water table aquifer varies from about 0 to 8 feet. Groundwater from the outwash soils discharges along a line of seeps at the bluff base. The upper sand and gravel layer in this area has a total thickness as little as 10 feet thick and a saturated thickness of 5 feet.

12.2 REGULATORY REQUIREMENTS

The OU5 ROD identified the COCs in groundwater at Site ST037 as TCE, benzene, total fuel hydrocarbons (TFH)-diesel, and TFH-gas; the COCs in surface water as sheen, TFH-gas and Jet Propulsion Fuel Number 4 (JP-4); and TFH-diesel as the only COC for soil. In 2008, the OU5 Remedial Action Report identified TAH and TAqH as the appropriate water quality standards to replace the former cleanup standards for TFH-gas and TFH diesel, respectively, in groundwater and surface water (USAF, 1998d).

The groundwater remedy described in the OU5 ROD (USAF, 1995c) consists of the following:

- Institutional controls on land and water use to restrict access to contaminated groundwater until cleanup levels listed in Table 3-6 of the OU5 ROD are achieved; and
- Groundwater monitoring to estimate the rate of natural attenuation, to provide an early warning of potential off-site contaminant migration and ensure protection of human health and the environment.

The surface water remedy in the OU5 ROD (USAF, 1995c) includes:

- Passive collection of contaminated seep water along the western and central bluffs into a constructed wetland where enhanced natural chemical, physical, and biological processes will reduce contamination to below cleanup levels;
- Monitoring of surface water near the exit of the constructed wetland to ensure that the wetland is reducing contaminant concentrations to levels that are below the Alaska Water Quality Standards specified in Table 3-6 of the OU5 ROD;
- Natural attenuation to treat seep and surface water in the Beaver Pond Wetland Area; and

- Monitoring of water from the seeps and Beaver Pond Wetland Areas to estimate the rate of natural attenuation and ensure that contamination does not reach Ship Creek.

Modifications to the ROD-specified remedy have been documented in three memorandums to the site file. The first memorandum to the site file adopted a sampling frequency decision guide (USAF, 2003g), while the second memorandum clarified how USAF intends to manage LUCs (USAF, 2011c), and the most recent memorandum to the site file documents implementation of passive operation of the wetland remediation system for seep water treatment.

12.2.1 Land Use Control Inspection

Wells OU5MW-09, NS3-2, and OU5MW-13, which were found to be frost-heaved in spring of 2014, were cut and resurveyed on 10 September 2014. A LUC inspection performed at ST037 on 18 September 2014 identified that Seep 1 requires more gravel in the groundwater collection area and well OU5MW-40 casing lid requires repair. A copy of the 2014 LUC inspection form for ST037 is provided in Appendix B.

12.3 WESTERN ST037 PLUME

The Western ST037 plume is comprised of the former Fairchild Avenue Plume, Kenney Avenue Plume, OU3MW-25 Plume, OU5MW-02 Plume, and SP1-02 Plume (Figure 12-1). In 2010 these plumes were found to be comingled into a single plume with multiple lobes. The western lobe of the Western ST037 Plume generally matches the extent of the former Fairchild Avenue Plume. The downgradient (southern) extent of the western lobe is defined by TCE concentrations less than the method detection limit at discrete groundwater sampling location FA06 (shown on Figure 12-1), collected in 2010, and wells OU5MW-37, OU5MW-40, and OU5MW-43. The central lobe of the Western ST037 Plume encompasses the footprints of the former OU3MW25, OU5MW-02, and SP1-02 Plumes. The eastern lobe of the Western ST037 Plume corresponds to the former Kenney Avenue Plume (USAF, 2011b).

12.3.1 2014 Field Activities and Results

During 2014, 10 groundwater monitoring wells and four seeps (OU5SP-09, OU5SP-10, OU5SP-11, and OU5SP-15) were sampled for TCE. Seeps OU5SP10 and OU5SP-11 are sampled quarterly and seeps OU5SP-09 and OU5SP-15 are sampled annually to monitor the OU5 Wetland Remediation System (Section 12.5). Additionally, a field duplicate sample was collected from well OU5MW-38. The concentration for TCE in the Western ST037 Plume continues to exceed the OU5 ROD cleanup levels in select wells and seeps. Table 12-1 presents a summary of the results. The 2014 and historical results are presented on Figure 12-1 and in Appendix C.

Field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are provided in Appendix A. The 2014 field parameter results match the historical observation of weakly aerobic to weakly anaerobic conditions across the site which suggests that the rate of TCE degradation is very low.

Total organic carbon concentrations reported for the former Fairchild Avenue Plume area in 2008 indicated a general absence of organic carbon in the downgradient portion of the plume, which explains why biogeochemical conditions at this site are likely to remain weakly aerobic to weakly anaerobic (USAF, 2009b). Therefore, the attainment of cleanup goals at this site will likely occur primarily as a result of other natural attenuation mechanisms including dispersion, adsorption, and dilution. Field parameters for the ST037 site are presented in Appendix A.

Table 12-1 Summary of 2014 Analytical Results at Western ST037 Plumes

Monitoring Well ID	TCE Result (µg/L)
OU3MW-11	**18.8**
OU5MW-34	*Well Blocked*
OU5MW-38	**11.4**
OU5MW-38 (FD)	**10.9**
OU5MW-46	ND [0.5]
403WL-01	**9.27**
OU5SP-09	1.75
OU5SP-10 Q1 (3/10/14)	NS
OU5SP-10 Q2 (7/8/14)	**7.86**
OU5SP-10 Q3 (9/9/14)	**6.62**
OU5SP-10 Q4 (12/16/14)	**6.42**
OU5SP-11 Q1 (3/10/14)	**7.8**
OU5SP-11 Q2 (7/8/14)	**9.63**
OU5SP-11 Q3 (9/9/14)	**8.56**
OU5SP-11 Q4 (12/16/14)	**9.7**
OU3MW-02	**9.13**
OU5MW-44	**21.8**
OU5MW-45 (July)	ND [0.5]
OU5MW-45 (November)	ND [0.5]
SP1-02	**8.95**
OU5MW-15	ND [0.5]
OU5SP-15	ND [0.5]

Notes:
[1] Cleanup levels cited in the OU5 ROD (USAF, 1995c).
µg/L = micrograms per liter
Bold result exceeds the cleanup level (5 µg/L)
FD = field duplicate
TCE = trichloroethene

The Mann-Kendall trend tests for TCE in wells 403WL-01, OU3MW-02, OU3MW-11 and OU5MW-44 and seep OU5SP-09 indicated statistically significant decreasing trends at the 95% confidence level. No statistically significant trends were identified for TCE in well OU5MW-38 or the seeps OU5SP-10 and OU5SP-11. Graph 12-1 presents the TCE trends on a logarithmic scale for the Western ST037 Plume wells.

12.3.2 Recommendations

Based on the results of the 2010 investigation, the following recommendations were made for the Western ST037 Plume:

- For the eastern lobe of the Western ST037 Plume (formerly the Kenney Avenue Plume), a new monitoring well is needed to evaluate trends in a previously unknown source area. An optimized method to selecting the location and screen interval for this source area monitoring well is to collect discrete groundwater samples between discrete sample locations FA01-2010, KA03, and KA05.
- For the central lobe of the Western ST037 Plume, one or more new monitoring wells are recommended for installation north of Fighter Drive to monitor source area(s). An optimized method to selecting the location and screen interval for each new well is to collect discrete groundwater samples between existing monitoring wells and the discrete groundwater sample points installed in 2010 as part of this study to determine the number and optimal monitoring location for each source are.
- For the western lobe of the Western ST037 Plume, (formerly the Fairchild Avenue Plume), installation of one source area well near Building 6211 between Arctic Warrior Drive and 12th Street is recommended. An optimized method to selecting the location and screen interval for this source area monitoring well is to collect discrete groundwater samples to supplement discrete sample locations installed in 2010 to determine the location of the highest TCE concentration in this area
- A discrete sampling event, outside of the LTM program , based on the 2010 investigation results and recommendations, which includes the installation of a minimum of three new wells and discrete sampling of up to 12 existing wells, is recommended to further delineate the Western ST037 Plume and optimize the current sampling approach. This sampling event would be used to determine the efficacy of current well network and add or remove wells based on results.

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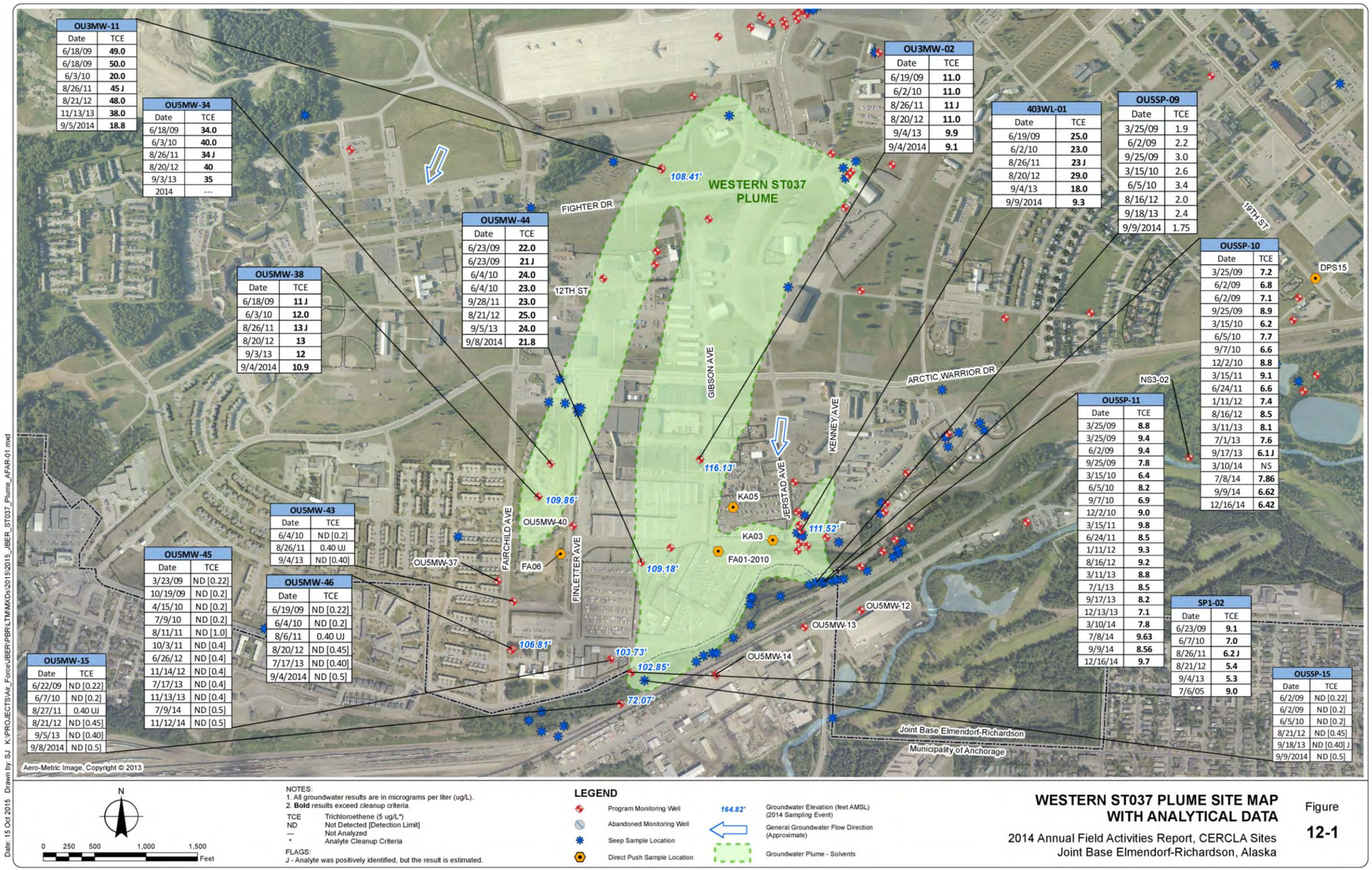
Figure 12-1 Western ST037 Plume Site Map with Analytical Data



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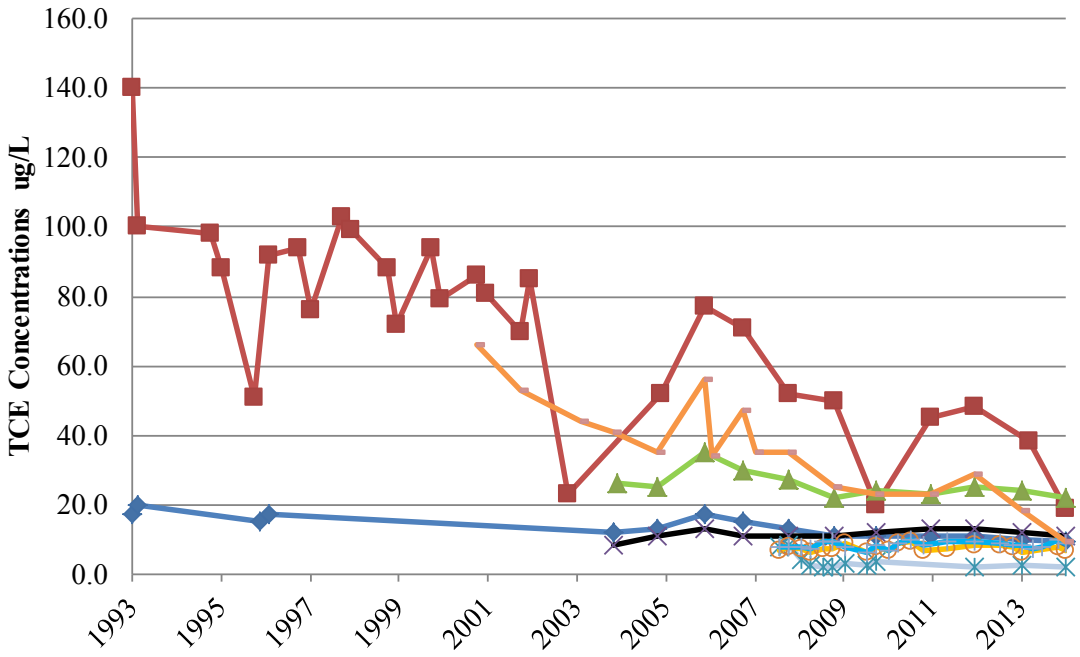
Graph 12-1 TCE Trends at the Western ST037 Plume



Symbol	Well ID	M-K Concentration Trend
	OU3MW-11	Decreasing Trend
	OU3MW-02	Decreasing Trend
	OU5MW-44	Decreasing Trend
	OU5MW-38	No significant Trend
	OU5SP-09	Decreasing Trend
	OU5SP-10	No significant Trend
	OU5SP-11	No significant Trend
	403WL-01	Decreasing Trend

ST037 TCE TRENDS IN MONITORING WELLS

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Graph
12-1

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12.4 SLAMMER AVENUE PLUMES

The Slammer Avenue Plumes are located near Slammer Avenue and Arctic Warrior Drive (Figure 12-2). The TCE concentrations in groundwater prior to 2007 indicated a single, diffuse plume approximately 200 ft to 600 ft wide and 1,500 ft long. The TCE data collected in September 2007 suggested two separate chlorinated VOC plumes exist at this site, an eastern and a western plume. Currently, the eastern plume is being identified as the downgradient portion extension of the SS022 Plume, a recently discovered TCE plume.

The Slammer Avenue Plumes may be contributing to TCE detected in groundwater seeps and the drainage ditch that flows into the Beaver Pond Area. The point of compliance for this site (BPSW-01) is at the outlet of the Beaver Pond Area (Figure 12-4), which is located on a tributary to Ship Creek. Additional discussion of COC results for groundwater seeps and surface water is provided in Section 12.5. The identified COC for the Slammer Avenue Plumes is TCE.

12.4.1 2014 Field Activities and Results

During 2014, groundwater monitoring wells GW-4A, OU5MW-06, OU5MW-07, and OU5MW-08 were sampled for VOCs. Additionally, a field duplicate sample was collected from well OU5MW-08. The TCE concentration in wells OU5MW-06 (8.61 µg/L) and OU5MW-07 (15.8 µg/L) exceeded the OU5 ROD groundwater cleanup levels of 5 µg/L. Table 12-3 presents a summary of analytical results. The 2014 and historical results are presented on Figure 12-2 and Appendix C.

Field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are provided Appendix A. According to the 2011 Annual Report, biogeochemical indicator parameters measured in samples from the Slammer Avenue Plumes suggest an environment that varies from oxidizing to reducing (anaerobic) (USAF, 2012a). In 2014, anaerobic conditions were present at wells GW-4A. In contrast, aerobic conditions were observed at wells OU5MW-06, OU5MW-07 and OU5MW-08. For the data in 2014, the ranges of individual parameter values and the corresponding interpretation of the active electron acceptor processes reported are generally consistent with findings from previous monitoring events, indicating that the biogeochemical conditions at this site are not changing significantly over time (USAF, 2012a).

Table 12-2 Summary of 2014 Analytical Results at Slammer Avenue Plumes

Analyte	Cleanup Level[1] (µg/L)	GW-4A	OU5MW-06	OU5MW-07	OU5MW-08	OU5MW-08 FD
TCE	5	4.08	**8.61**	**15.8**	2.46 J	3.76 J

Notes:

[1] Cleanup levels cited in the OU5 ROD (USAF, 1995c)
µg/L = micrograms per liter
Bold result exceeds the cleanup level
TCE = trichloroethene

The Mann-Kendall trend tests for TCE in wells GW-4A, OU5MW-06, and OU5MW-07 indicated statistically significant decreasing trends at the 95% confidence level (Graph 12-2). No statistically significant trend was identified for TCE in well OU5MW-08.

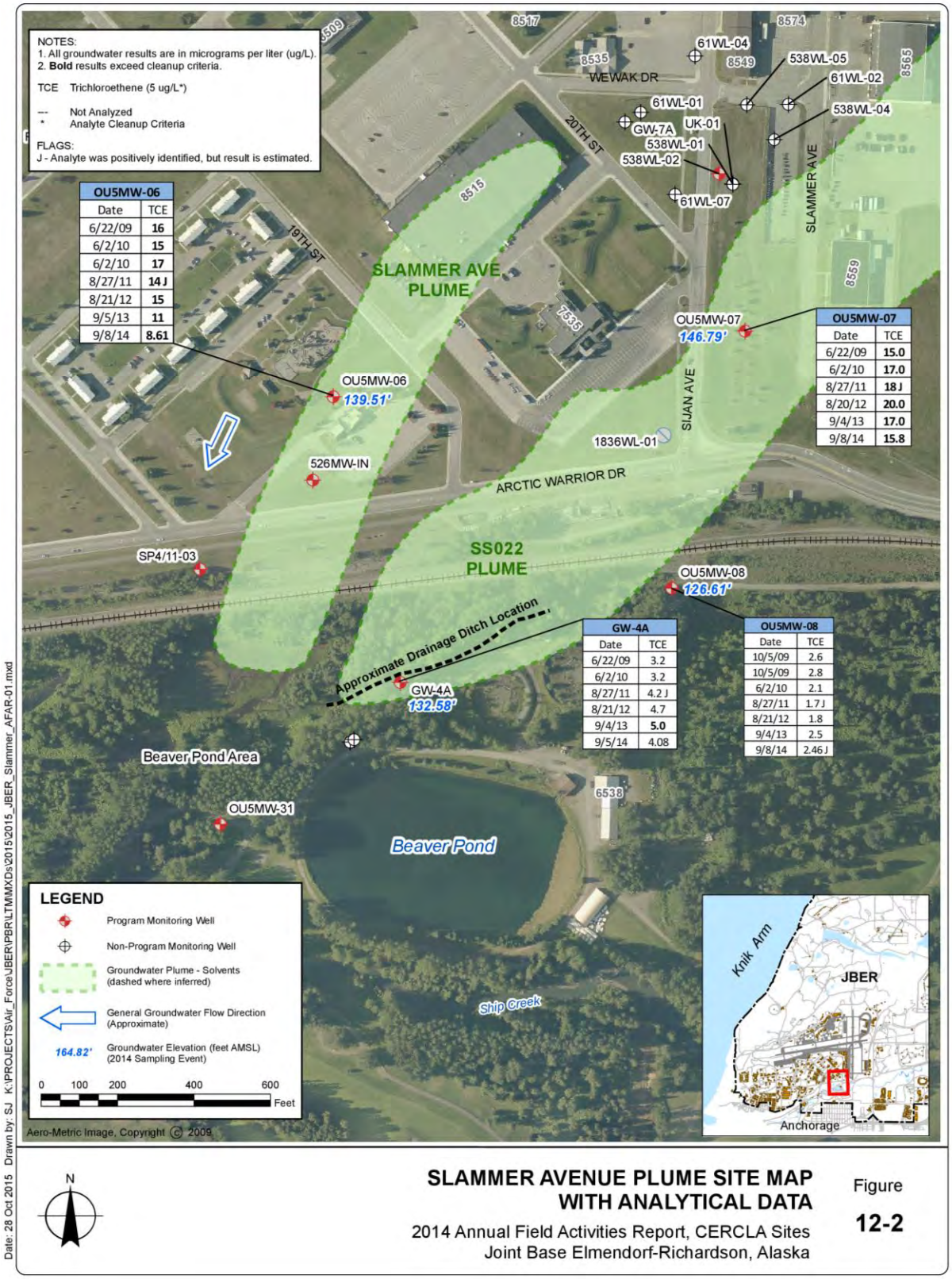
12.4.2 Recommendations

The TCE concentrations measured in the eastern Slammer Avenue Plume at wells OU5MW-06 and OU5MW-07 continue to exceed the OU5 ROD cleanup levels; concentrations measured at this well have been similar from 2007 through 2014. The eastern Slammer Avenue Plume cross-gradient well (OU5MW-08) and well located at the leading edge of the plume (GW-4A) do not have concentrations exceeding the OU5 ROD cleanup levels. This plume has been identified as the leading edge of the SS022 Plume. It is recommended that a monitoring program for SS022 be established.

Based on the results of the 2010 investigation, the following additional recommendations were made for the Slammer Avenue Plumes:

- For the eastern Slammer Avenue Plume, additional investigation is needed to further delineate the plume. The first data need is to determine the location of the plume source and install a monitoring well to monitor the change in source area concentration over time. The second data need is to confirm that a portion of this plume does not flow under the drainage ditch that currently flows into the Beaver Pond Area. If the plume is determined to underflow the drainage ditch, establishing a new monitoring well between the toe of the plume and Ship Creek to document plume stability and remedy protectiveness is recommended.
- For the western Slammer Avenue Plume, a new monitoring well is needed to evaluate trends in source area concentrations. An optimized method to selecting the location and screen interval for this new well is to collect discrete groundwater samples around Building 8515 to determine if there are any locations where TCE concentrations are greater than 24 µg/L, as measured at DPS15 in 2007. If no additional data is collected prior to well installation, the well should be installed near DPS15.
- An additional recommendation for the Slammer Avenue Plumes is to continue surface water monitoring at the existing Beaver Pond Area surface water monitoring points to demonstrate compliance, but to reduce the frequency of sample collection. Based on a long record of historical data and the current understanding of site hydraulics, reduction in sampling frequency to semi-annual for BPSW-01, and annual for the other three Beaver Pond surface water monitoring points is also deemed sufficient supporting future plume stability assessments and protectiveness assessments for the Slammer Avenue Plumes.

Figure 12-2 Slammer Avenue Plume Site Map with Analytical Data



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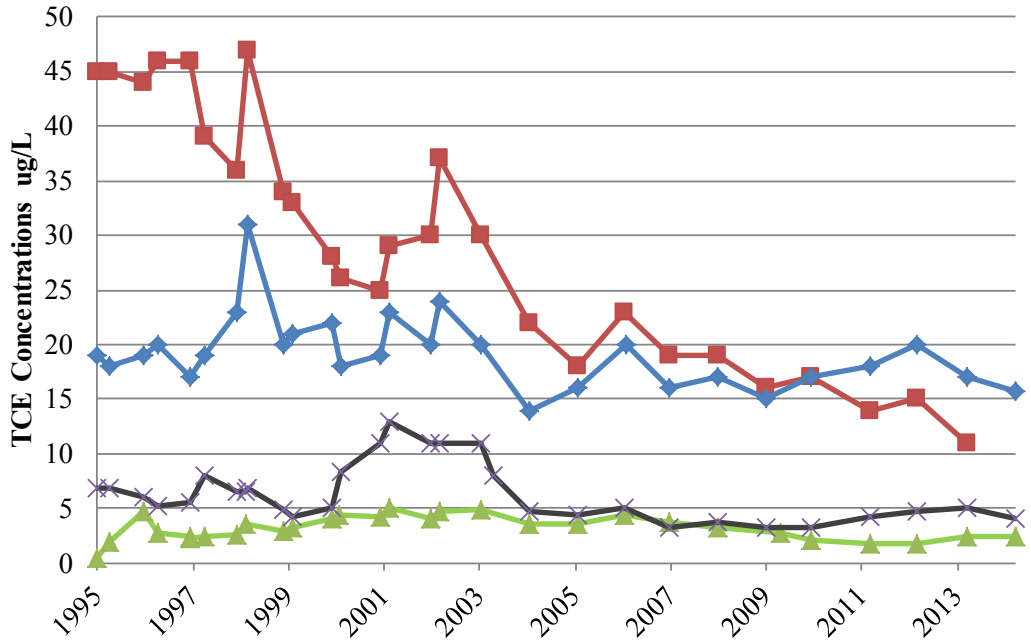
Graph 12-2 TCE Trends at the Slammer Avenue Plume



Symbol	Well ID	M-K Concentration Trend
	OU5MW-06	Decreasing Trend
	OU5MW-07	Decreasing Trend
	OU5MW-08	No significant Trend
	GW-4A	Decreasing Trend

SLAMMER AVE PLUME TCE TRENDS IN MONITORING WELLS

2014 Annual Field Activities Report, CERCLA Sites
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Graph **12-2**

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12.5 SEEPS, SURFACE WATER, AND WETLAND REMEDIATION SYSTEMS

Along the southern boundary of JBER, seeps, surface water features, and the Wetland Remediation System make up a system of discharge points, monitoring locations, and treatment systems associated with Site ST037 (Figure 12-3).

12.5.1 Seep and Surface Water Sampling System

Twenty seeps have been identified south of 2nd Street and downgradient of the Fairchild Avenue Plume, OU5MW-02 Plume, or Kenney Avenue Plume.

Historically, some of these seeps have been contaminated with benzene, TAH, TAqH, and/or TCE at concentrations that exceeded cleanup levels. Currently, five seeps (OU5SP-09, OU5SP-10, OU5SP-11, OU5SP-17, and OU5SP-18) are configured to discharge directly into the Wetland Treatment Cell. Concentrations of contaminants of concern in water are currently monitored within the Wetland Treatment Cell at three locations (WCSW-02, WCSW-03, and WCSW-04) and two locations at the Pump Station #1 seep collection area (OU5CP-01 and OU5CP-02) to gauge the effectiveness of the passive operations of the Wetland Remediation System (Figure 12-3). Concentrations of contaminants of concern were also historically measured at a fourth location (WCSW-01), which was the discharge point for water entering the Wetland Treatment Cell from three pump stations. Monitoring has not been performed at WCSW-01 since 2011 because the pump stations have not been operated since 2009 in an effort to passively operate the wetland remediation system (See Section 12.5.2 for a discussion of the Wetlands Treatment System).

TCE concentrations have consistently been detected in surface water samples collected from the Beaver Pond Area (Figure 12-4). The probable sources of TCE contamination in the Beaver Pond Area are the Slammer Avenue Plume and SS022 Plume, with recent site data suggesting that groundwater discharge into the drainage ditch flowing into the Beaver Pond Area is a significant source of the contaminants detected in surface water. The COCs entering the Beaver Pond Area naturally attenuate in the pond before surface water flows into Ship Creek. This process is monitored at four locations (BPSW01, BPSW-03, BPSW-04, and BPSW-05). Effluent from the Beaver Pond Area is monitored at sample point BPSW-01.

The Mann-Kendall trend tests for TCE in surface water locations BPSW-04 and BPSW-05 indicated statistically significant increasing trends at the 95% confidence level. No statistically significant trend was identified for TCE in the other sample locations.

All seeps and surface water ultimately discharge to Ship Creek. Surface water in Ship Creek is monitored at two locations (SC-01B and SC-08) to evaluate water quality of this receptor (Figure 12-5).

12.5.2 Wetland Remediation System

The Wetland Remediation System was constructed in 1996 to treat contaminated groundwater emerging from several seeps along the southern bluff of JBER- Elmendorf. The purpose of the system was to remediate petroleum hydrocarbon contamination in seeps OU5SP-01 through OU5SP-04 and TCE in five other seeps (OU5SP-09, OU5SP-10, OU5SP-11, OU5SP-17, and OU5SP-18). The Wetland Remediation System was designed to treat contaminants through a combination of passive and active system components. Components that originally contributed to treatment were:

- Gravel-lined collection areas for seeps OU5SP-01 through OU5SP-04 and OU5SP-09 through OU5SP-11
- Pump Stations #1, #2, and #3
- Overland Flow Cell for water collected from seeps OU5SP-01 through OU5SP-04
- Wetland Treatment Cell for effluent from the Overland Flow Cell and seeps OU5SP-09, OU5SP-10, OU5SP-11, OU5SP-17, and OU5SP-18.

The primary treatment process in the seep collection areas are believed to be biodegradation, achieved by a biofilm that has developed as a coating on the saturated gravel. Prior to 2007, water from the seep collection areas was transported via the three pump stations to the Overland Flow Cell, which removed hydrocarbon contamination through a combination of volatilization and aerobic biodegradation that was enhanced by increasing DO concentrations in the water. Treated water from the Overland Flow Cell was gravity fed into the Wetland Treatment Cell, except during the coldest winter months; when the Overland Flow Cell was shut down to prevent flooding. While the Overland Flow Cell was shut down, water from the seep collection areas was pumped directly into the Wetland Treatment Cell. The treatment processes active in the Wetland Treatment Cell include volatilization, sorption, phytoremediation, and biodegradation. Retention time in the wetland is controlled and maintained at greater than five days to ensure that adequate remediation occurs. Effluent from the Wetland Treatment Cell discharges to Ship Creek via underground culverts and ditches.

Over the past five years, components of the remediation system have been shut down based on analytical data which indicated that they were no longer needed or as part of an ongoing Wetland Remediation System Optimization Study (Optimization Study) described in the 2009 Zone 2 and Zone 3 Management Areas Work Plan (USAF, 2009c) and performed during 2009 and 2010. The purpose of the Optimization Study was to evaluate, in three phases, whether the Wetland Remediation System could achieve treatment objectives established by the OU5 ROD when operated without pump station operation. The results of Phases I and II of the Optimization Study are described in a report published in March 2010 (USAF, 2010c).

In 2007, Pump Station #3 was shut down because concentrations of COCs in the associated seep (OU5SP-04) were below cleanup levels. The results of Phases I and II of the Optimization Study

indicated that COC degradation within the two seep collection areas serviced by Pump Stations #1 and #2 was sufficient to achieve applicable cleanup standards within the seep collection areas prior to discharge from those areas.

The results of Phase III, described in an addendum to the Optimization Study report (USAF, 2010d) were generally consistent with the results of Phases I and II, with the exception that modifications to the configuration of the Pump Station #1 seep collection area might be necessary to 1) increase the retention time of COCs from seep OU5SP-02 in the collection area, and 2) maintain the water level within the collection area at an elevation below ground level.

The USAF will not restart the active components of the OU5 Wetland Remediation System. The USAF, EPA, and ADEC have agreed and signed the OU5 Memorandum to the Site File (USAF, 2011c) for a non-significant change to the OU5 ROD that formally changes the OU5 Wetland Remediation System treatment approach from an active (i.e., pumping) to a passive system.

12.5.3 2014 Field Activities and Results

In 2014, ten seeps, nine surface water locations, two control points (OU5CP-01 and OU5CP-02), and one sediment location (WCSD-09) were sampled at varying frequencies. Field duplicate samples were collected from WCSW-02, BPSW-01 and WCSD-09. Samples from all locations were analyzed for VOCs and PAHs. Surface water was sampled at two locations in Ship Creek, three locations at the Wetland Treatment Cell, and four locations in the Beaver Pond Area. Sediments were also sampled at one point in the Wetland Treatment Cell near the outfall of the discharge points for seeps OU5SP-09, OU5SP-10, and OU5SP-11 (Figure 12-3). The Mann-Kendall trend tests for benzene in seep OU5SP-02, and TCE in seeps OU5SP-10 and OU5SP-11 indicated no statistically significant trends at the 95% confidence level.

TAH and TAqH concentrations measured at seeps OU5SP-01 and OU5SP-02 exceeded the cleanup levels of 10 µg/L for TAH, and 15 µg/L for TAqH in each sample collected. A sample was not collected from OU5SP-02 during the first quarter because the seep was frozen. Benzene concentrations measured at seep OU5SP-02 exceeded the OU5 ROD cleanup level of 5 µg/L during all three sampling events in 2014 (Figure 12-3). These results are consistent with previous results. The two control points are at the exit point of the seep collection area downgradient of the seep sample collection points. The OU5SP-01 and -02 collection points are inside the designed seep collection area. The area between the seeps and the collection point is functioning as a natural wetland and is remediating the contaminants. Sample collection points OU5CP-01 is located near the former inlet of pump station #1. Sample collection points OU5CP-02 is located about 10 feet away at the designed overflow point in the berm at the lower edge of the seep area. Both sample points are located at low points in the seep area.

The TAH and TAqH concentrations in the surface water sample collected during the second quarter from control point OU5CP-01 exceeded the OU5 ROD cleanup level. This indicates that the exceedances at OU5SP-01 and OU5SP-02 had reached the control point OU5CP-01 during

that quarter. TAH and TAqH concentrations in surface water samples collected from control point OU5CP-02, however, did not exceed the OU5 ROD cleanup level in any sample collected. As stated above, OU5CP-02 is located about 10 feet away from OU5CP-01 at the designed overflow point in the berm at the lower edge of the seep area. This suggests that the exceedances at OU5CP-01 did not impact downstream receptors.

The TCE concentrations measured at seeps OU5SP-10 and OU5SP-11 exceeded the cleanup level of 5 µg/L in each sample collected in 2014. This is consistent with previous results.

Samples were collected from three surface water locations (WCSW-02, WCSW-03, and WCSW-04) and one sediment location (WCSD-09) at the Wetland Treatment Cell. All results for VOCs, TAH, and TAqH were below cleanup levels in surface water samples collected from WCSW-02, WCSW-03, and WCSW-04 during 2014. All VOC (both methanol-preserved and low-level methods) and PAH results for the sample collected from sediment location WCSD-09 were below cleanup levels.

Samples were collected from four surface water locations (BPSW-01, BPSW-03, BPSW-04, and BPSW-05) at the Beaver Pond Area. The TCE concentrations measured in the Beaver Pond Area surface water samples from locations BPSW-04 and BPSW-05 exceeded the cleanup level of 5 µg/L during all 2014 quarterly sample events (Figure 12-4). The TCE concentrations measured from location BPSW-03 were below the cleanup level. Concentrations of other VOCs, TAH, and TAqH were below cleanup levels at sample locations BPSW-03, BPSW-04, and BPSW-05. All VOCs, TAH, and TAqH concentrations were below cleanup levels at surface water sample point BPSW-01, located at the Beaver Pond Area discharge point.

All VOCs, TAH, and TAqH concentrations were below cleanup levels in surface water samples collected from Ship Creek (SC-01B and SC-08) in 2013 (Figure 12-5).

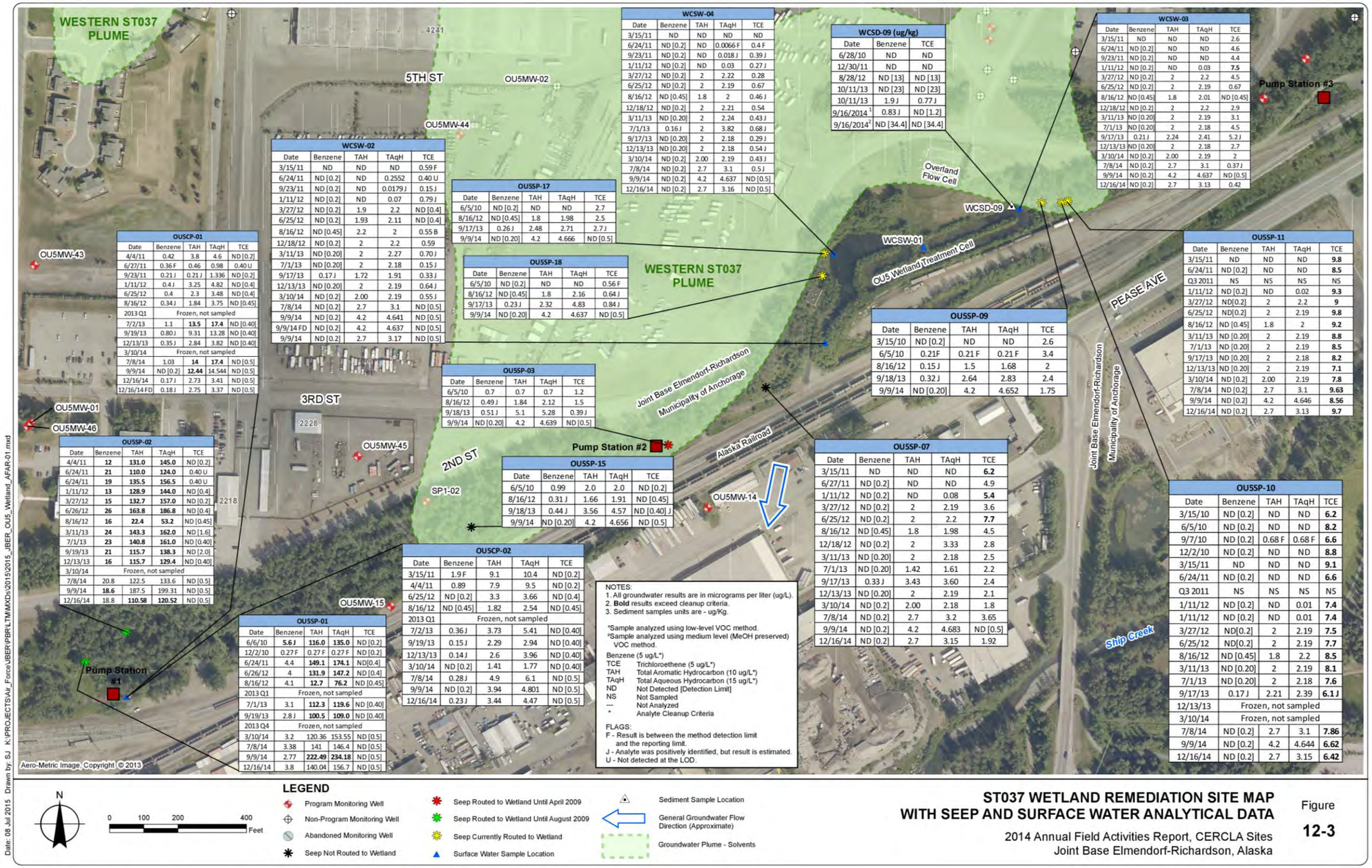
All seep and surface water sampling locations were checked to ensure that they are adequately marked. Survey equipment was used to verify the locations.

12.5.4 Seeps, Surface Water, and Wetland Remediation Systems Site Summary and Recommendations

The results of visual inspection and assessment of analytical data demonstrate that pumping is not required for the Wetland Remediation System to reduce influent COC concentrations in seeps to concentrations that are below applicable cleanup levels. Continued operation of the Wetland Remediation System in a passive configuration is recommended.

Based on the results of the 2010 investigation it is recommended to continue surface water monitoring at the existing Beaver Pond Area surface water monitoring points, but to alter the frequency of sample collection (USAF, 2011b).

Figure 12-3 ST037 Wetland Remediation SiteMap with Seep and Surface Water Analytical Data



WCSW-04

Date	Benzene	TAH	TAqH	TCE
3/15/11	ND	ND	ND	ND
6/24/11	ND [0.2]	ND	0.0066 F	0.4 F
9/23/11	ND [0.2]	ND	0.018 J	0.39 J
1/11/12	ND [0.2]	ND	0.03	0.27 J
3/27/12	ND [0.2]	2	2.22	0.28
6/25/12	ND [0.2]	2	2.19	0.67
8/16/12	ND [0.45]	1.8	2	0.46 J
12/18/12	ND [0.2]	2	2.21	0.54
3/11/13	ND [0.20]	2	2.24	0.43 J
7/1/13	0.16 J	2	3.82	0.68 J
9/17/13	ND [0.20]	2	2.18	0.29 J
12/13/13	ND [0.20]	2	2.18	0.54 J
3/10/14	ND [0.2]	2.00	2.19	0.43 J
7/8/14	ND [0.2]	2.7	3.1	0.5 J
9/9/14	ND [0.2]	4.2	4.637	ND [0.5]
12/16/14	ND [0.2]	2.7	3.16	ND [0.5]

WCSD-09 (ug/kg)

Date	Benzene	TCE
6/28/10	ND	ND
12/30/11	ND	ND
8/28/12	ND [13]	ND [13]
10/11/13	ND [23]	ND [23]
10/11/13	1.9 J	0.77 J
9/16/2014[1]	0.83 J	ND [1.2]
9/16/2014[2]	ND [34.4]	ND [34.4]

WCSW-03

Date	Benzene	TAH	TAqH	TCE
3/15/11	ND	ND	ND	2.6
6/24/11	ND [0.2]	ND	ND	4.6
9/23/11	ND [0.2]	ND	ND	4.4
1/11/12	ND [0.2]	ND	0.03	**7.5**
3/27/12	ND [0.2]	2	2.2	4.5
6/25/12	ND [0.2]	2	2.19	0.67
8/16/12	ND [0.45]	1.8	2.01	ND [0.45]
12/18/12	ND [0.2]	2	2.2	2.9
3/11/13	ND [0.20]	2	2.19	3.1
7/1/13	ND [0.20]	2	2.18	4.5
9/17/13	0.21 J	2.24	2.41	5.2 J
12/13/13	ND [0.20]	2	2.18	2.7
3/10/14	ND [0.2]	2.00	2.19	2
7/8/14	ND [0.2]	2.7	3.1	0.37 J
9/9/14	ND [0.2]	4.2	4.637	ND [0.5]
12/16/14	ND [0.2]	2.7	3.13	0.42

WCSW-02

Date	Benzene	TAH	TAqH	TCE
3/15/11	ND	ND	ND	0.59 F
6/24/11	ND [0.2]	ND	0.2552	0.40 U
9/23/11	ND [0.2]	ND	0.0179 J	0.15 J
1/11/12	ND [0.2]	ND	0.07	0.79 J
3/27/12	ND [0.2]	1.9	2.2	ND [0.4]
6/25/12	ND [0.2]	1.93	2.11	ND [0.4]
8/16/12	ND [0.45]	2.2	2	0.55 B
12/18/12	ND [0.2]	2	2.2	0.59
3/11/13	ND [0.20]	2	2.27	0.70 J
7/1/13	ND [0.20]	2	2.18	0.15 J
9/17/13	0.17 J	1.72	1.91	0.33 J
12/13/13	ND [0.20]	2	2.19	0.64 J
3/10/14	ND [0.2]	2.00	2.19	0.55 J
7/8/14	ND [0.2]	2.7	3.1	ND [0.5]
9/9/14	ND [0.2]	4.2	4.641	ND [0.5]
9/9/14 FD	ND [0.2]	4.2	4.637	ND [0.5]
9/9/14	ND [0.2]	2.7	3.17	ND [0.5]

OU5SP-17

Date	Benzene	TAH	TAqH	TCE
6/5/10	ND [0.2]	ND	ND	2.7
8/16/12	ND [0.45]	1.8	1.98	2.5
9/17/13	0.26 J	2.48	2.71	2.7 J
9/9/14	ND [0.20]	4.2	4.666	ND [0.5]

OU5SP-18

Date	Benzene	TAH	TAqH	TCE
6/5/10	ND [0.2]	ND	ND	0.56 F
8/16/12	ND [0.45]	1.8	2.16	0.64 J
9/17/13	0.23 J	2.32	4.83	0.84 J
9/9/14	ND [0.20]	4.2	4.637	ND [0.5]

OU5SP-03

Date	Benzene	TAH	TAqH	TCE
6/5/10	0.7	0.7	0.7	1.2
8/16/12	0.49 J	1.84	2.12	1.5
9/18/13	0.51 J	5.1	5.28	0.39 J
9/9/14	ND [0.20]	4.2	4.639	ND [0.5]

OU5SP-09

Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	2.6
6/5/10	0.21F	0.21 F	0.21 F	3.4
8/16/12	0.15 J	1.5	1.68	2
9/18/13	0.32 J	2.64	2.83	2.4
9/9/14	ND [0.20]	4.2	4.652	1.75

OU5SP-11

Date	Benzene	TAH	TAqH	TCE
3/15/11	ND	ND	ND	**9.8**
6/24/11	ND [0.2]	ND	ND	**8.5**
Q3 2011	NS	NS	NS	NS
1/11/12	ND [0.2]	ND	0.02	**9.3**
3/27/12	ND[0.2]	2	2.2	**9**
6/25/12	ND[0.2]	2	2.19	**9.8**
8/16/12	ND [0.45]	1.8	2	**9.2**
3/11/13	ND [0.20]	2	2.19	**8.8**
7/1/13	ND [0.20]	2	2.19	**8.5**
9/17/13	ND [0.20]	2	2.18	**8.2**
12/13/13	ND [0.20]	2	2.19	**7.1**
3/10/14	ND [0.2]	2.00	2.19	**7.8**
7/8/14	ND [0.2]	2.7	3.1	**9.63**
9/9/14	ND [0.2]	4.2	4.646	**8.56**
12/16/14	ND [0.2]	2.7	3.13	**9.7**

OU5SP-15

Date	Benzene	TAH	TAqH	TCE
6/5/10	0.99	2.0	2.0	ND [0.2]
8/16/12	0.31 J	1.66	1.91	ND [0.45]
9/18/13	0.44 J	3.56	4.57	ND [0.40] J
9/9/14	ND [0.20]	4.2	4.656	ND [0.5]

OU5SP-07

Date	Benzene	TAH	TAqH	TCE
3/15/11	ND	ND	ND	**6.2**
6/27/11	ND [0.2]	ND	ND	4.9
1/11/12	ND [0.2]	ND	0.08	**5.4**
3/27/12	ND [0.2]	2	2.19	3.6
6/25/12	ND [0.2]	2	2.2	**7.7**
8/16/12	ND [0.45]	1.8	1.98	4.5
12/18/12	ND [0.2]	2	3.33	2.8
3/11/13	ND [0.20]	2	2.18	2.5
7/1/13	ND [0.20]	1.42	1.61	2.2
9/17/13	0.33 J	3.43	3.60	2.4
12/13/13	ND [0.20]	2	2.19	2.1
3/10/14	ND [0.2]	2.00	2.18	1.8
7/8/14	ND [0.2]	2.7	3.2	3.65
9/9/14	ND [0.2]	4.2	4.683	ND [0.5]
12/16/14	ND [0.2]	2.7	3.15	1.92

OU5SP-10

Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	**6.2**
6/5/10	ND [0.2]	ND	ND	**8.2**
9/7/10	ND [0.2]	0.68 F	0.68 F	**6.6**
12/2/10	ND [0.2]	ND	ND	**8.8**
3/15/11	ND	ND	ND	**9.1**
6/24/11	ND [0.2]	ND	ND	**6.6**
Q3 2011	NS	NS	NS	NS
1/11/12	ND [0.2]	ND	0.01	**7.4**
1/11/12	ND [0.2]	ND	0.01	**7.4**
3/27/12	ND[0.2]	2	2.19	**7.5**
6/25/12	ND[0.2]	2	2.19	**7.7**
8/16/12	ND [0.45]	1.8	2.2	**8.5**
3/11/13	ND [0.20]	2	2.19	**8.1**
7/1/13	ND [0.20]	2	2.18	**7.6**
9/17/13	0.17 J	2.21	2.39	**6.1 J**
12/13/13	Frozen, not sampled			
3/10/14	Frozen, not sampled			
7/8/14	ND [0.2]	2.7	3.1	**7.86**
9/9/14	ND [0.2]	4.2	4.644	**6.62**
12/16/14	ND [0.2]	2.7	3.15	**6.42**

OU5CP-01

Date	Benzene	TAH	TAqH	TCE
4/4/11	0.42	3.8	4.6	ND [0.2]
6/27/11	0.36 F	0.46	0.98	0.40 U
9/23/11	0.21 J	0.21 J	1.336	ND [0.2]
1/11/12	0.4 J	3.25	4.82	ND [0.4]
6/25/12	0.4	2.3	3.48	ND [0.4]
8/16/12	0.34 J	1.84	3.75	ND [0.45]
2013 Q1	Frozen, not sampled			
7/2/13	1.1	**13.5**	**17.4**	ND [0.40]
9/19/13	0.80 J	9.31	13.28	ND [0.40]
12/13/13	0.35 J	2.84	3.82	ND [0.40]
3/10/14	Frozen, not sampled			
7/8/14	1.03	**14**	**17.4**	ND [0.5]
9/9/14	ND [0.2]	**12.44**	14.544	ND [0.5]
12/16/14	0.17 J	2.73	3.41	ND [0.5]
12/16/14 FD	0.18 J	2.75	3.37	ND [0.5]

OU5SP-02

Date	Benzene	TAH	TAqH	TCE
4/4/11	**12**	**131.0**	**145.0**	ND [0.2]
6/24/11	**21**	**110.0**	**124.0**	0.40 U
6/24/11	**19**	**135.5**	**156.5**	0.40 U
1/11/12	**13**	**128.9**	**144.0**	ND [0.4]
3/27/12	**15**	**132.7**	**157.0**	ND [0.2]
6/26/12	**26**	**163.8**	**186.8**	ND [0.4]
8/16/12	**16**	**22.4**	**53.2**	ND [0.45]
3/11/13	**24**	**143.3**	**162.0**	ND [1.6]
7/1/13	**23**	**140.8**	**161.0**	ND [0.40]
9/19/13	**21**	**115.7**	**138.3**	ND [2.0]
12/13/13	**16**	**115.7**	**129.4**	ND [0.40]
3/10/14	Frozen, not sampled			
7/8/14	20.8	122.5	133.6	ND [0.5]
9/9/14	**18.6**	187.5	199.31	ND [0.5]
12/16/14	18.8	**110.58**	**120.52**	ND [0.5]

OU5CP-02

Date	Benzene	TAH	TAqH	TCE
3/15/11	1.9 F	9.1	10.4	ND [0.2]
4/4/11	0.89	7.9	9.5	ND [0.2]
6/25/12	ND [0.2]	3.3	3.66	ND [0.4]
8/16/12	ND [0.45]	1.82	2.54	ND [0.45]
2013 Q1	Frozen, not sampled			
7/2/13	0.36 J	3.73	5.41	ND [0.40]
9/19/13	0.15 J	2.29	2.94	ND [0.40]
12/13/13	0.14 J	2.6	3.96	ND [0.40]
3/10/14	ND [0.2]	1.41	1.77	ND [0.40]
7/8/14	0.28 J	4.9	6.1	ND [0.5]
9/9/14	ND [0.2]	3.94	4.801	ND [0.5]
12/16/14	0.23 J	3.44	4.47	ND [0.5]

OU5SP-01

Date	Benzene	TAH	TAqH	TCE
6/6/10	**5.6 J**	**116.0**	**135.0**	ND [0.2]
12/2/10	0.27 F	0.27 F	0.27 F	ND [0.2]
6/24/11	4.4	**149.1**	**174.1**	ND[0.4]
6/26/12	4	**131.9**	**147.2**	ND [0.4]
8/16/12	4.1	**12.7**	**76.2**	ND [0.45]
2013 Q1	Frozen, not sampled			
7/1/13	3.1	**112.3**	**119.6**	ND [0.40]
9/19/13	2.8 J	**100.5**	**109.0**	ND [0.40]
2013 Q4	Frozen, not sampled			
3/10/14	3.2	120.36	153.55	ND [0.5]
7/8/14	3.38	141	146.4	ND [0.5]
9/9/14	2.77	**222.49**	**234.18**	ND [0.5]
12/16/14	3.8	140.04	156.7	ND [0.5]

NOTES:
1. All groundwater results are in micrograms per liter (ug/L).
2. **Bold** results exceed cleanup criteria.
3. Sediment samples units are - ug/Kg.

[1]Sample analyzed using low-level VOC method.
[2]Sample analyzed using medium level (MeOH preserved) VOC method.

Benzene (5 ug/L*)
TCE Trichloroethene (5 ug/L*)
TAH Total Aromatic Hydrocarbon (10 ug/L*)
TAqH Total Aqueous Hydrocarbon (15 ug/L*)
ND Not Detected [Detection Limit]
NS Not Sampled
--- Not Analyzed
* Analyte Cleanup Criteria

FLAGS:
F - Result is between the method detection limit and the reporting limit.
J - Analyte was positively identified, but result is estimated.
U - Not detected at the LOD.

N

0 100 200 400 Feet

LEGEND

- Program Monitoring Well
- Non-Program Monitoring Well
- Abandoned Monitoring Well
- Seep Not Routed to Wetland
- Seep Routed to Wetland Until April 2009
- Seep Routed to Wetland Until August 2009
- Seep Currently Routed to Wetland
- Surface Water Sample Location
- Sediment Sample Location
- General Groundwater Flow Direction (Approximate)
- Groundwater Plume - Solvents

ST037 WETLAND REMEDIATION SITE MAP WITH SEEP AND SURFACE WATER ANALYTICAL DATA

2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Figure **12-3**

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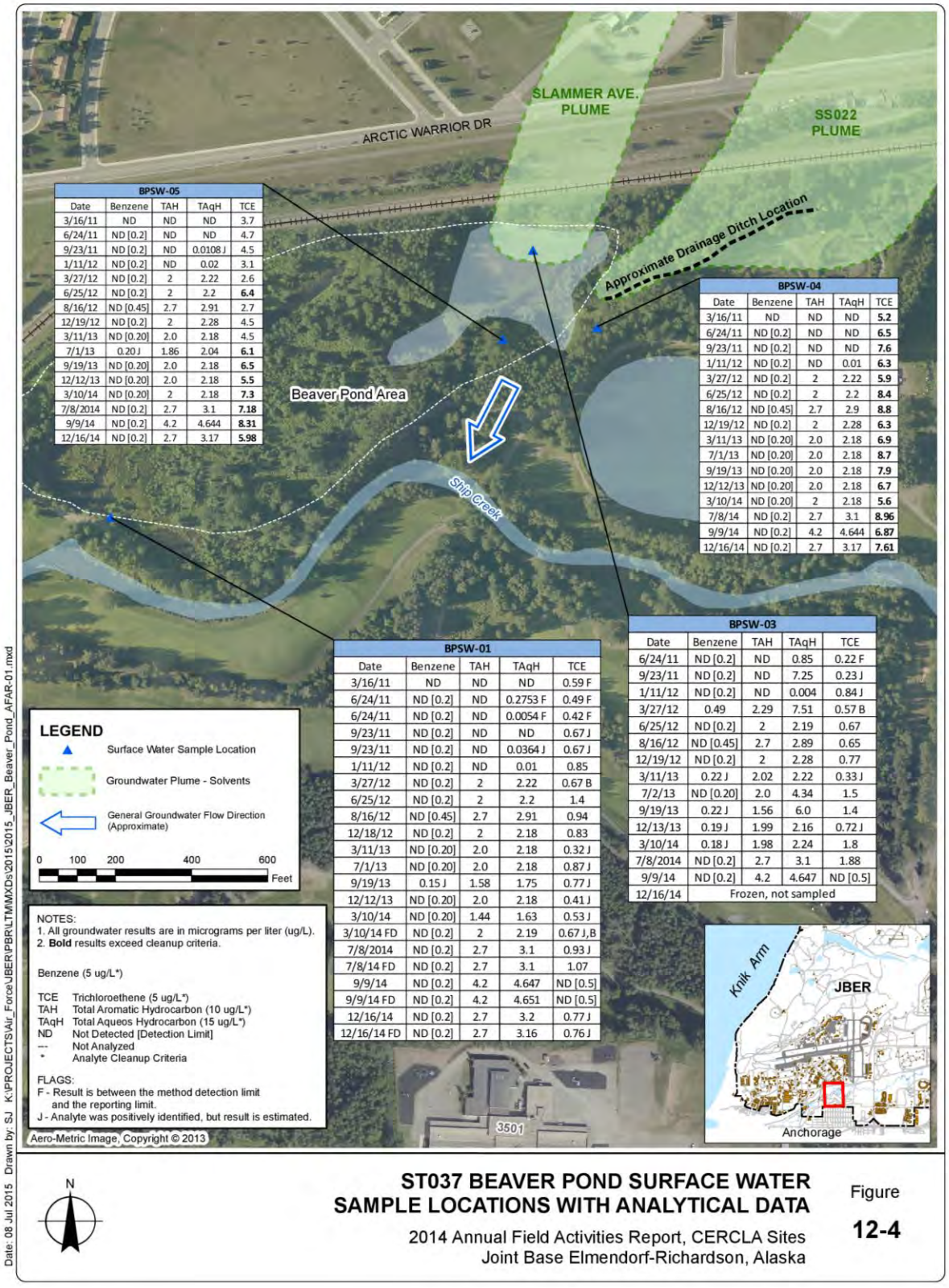
Figure 12-4 ST037 Beaver Pond Surface Water Sample Locations with Analytical Data



BPSW-05

Date	Benzene	TAH	TAqH	TCE
3/16/11	ND	ND	ND	3.7
6/24/11	ND [0.2]	ND	ND	4.7
9/23/11	ND [0.2]	ND	0.0108 J	4.5
1/11/12	ND [0.2]	ND	0.02	3.1
3/27/12	ND [0.2]	2	2.22	2.6
6/25/12	ND [0.2]	2	2.2	**6.4**
8/16/12	ND [0.45]	2.7	2.91	2.7
12/19/12	ND [0.2]	2	2.28	4.5
3/11/13	ND [0.20]	2.0	2.18	4.5
7/1/13	0.20 J	1.86	2.04	**6.1**
9/19/13	ND [0.20]	2.0	2.18	**6.5**
12/12/13	ND [0.20]	2.0	2.18	**5.5**
3/10/14	ND [0.20]	2	2.18	**7.3**
7/8/2014	ND [0.2]	2.7	3.1	**7.18**
9/9/14	ND [0.2]	4.2	4.644	**8.31**
12/16/14	ND [0.2]	2.7	3.17	**5.98**

BPSW-04

Date	Benzene	TAH	TAqH	TCE
3/16/11	ND	ND	ND	**5.2**
6/24/11	ND [0.2]	ND	ND	**6.5**
9/23/11	ND [0.2]	ND	ND	**7.6**
1/11/12	ND [0.2]	ND	0.01	**6.3**
3/27/12	ND [0.2]	2	2.22	**5.9**
6/25/12	ND [0.2]	2	2.2	**8.4**
8/16/12	ND [0.45]	2.7	2.9	**8.8**
12/19/12	ND [0.2]	2	2.28	**6.3**
3/11/13	ND [0.20]	2.0	2.18	**6.9**
7/1/13	ND [0.20]	2.0	2.18	**8.7**
9/19/13	ND [0.20]	2.0	2.18	**7.9**
12/12/13	ND [0.20]	2.0	2.18	**6.7**
3/10/14	ND [0.20]	2	2.18	**5.6**
7/8/14	ND [0.2]	2.7	3.1	**8.96**
9/9/14	ND [0.2]	4.2	4.644	**6.87**
12/16/14	ND [0.2]	2.7	3.17	**7.61**

BPSW-03

Date	Benzene	TAH	TAqH	TCE
6/24/11	ND [0.2]	ND	0.85	0.22 F
9/23/11	ND [0.2]	ND	7.25	0.23 J
1/11/12	ND [0.2]	ND	0.004	0.84 J
3/27/12	0.49	2.29	7.51	0.57 B
6/25/12	ND [0.2]	2	2.19	0.67
8/16/12	ND [0.45]	2.7	2.89	0.65
12/19/12	ND [0.2]	2	2.28	0.77
3/11/13	0.22 J	2.02	2.22	0.33 J
7/2/13	ND [0.20]	2.0	4.34	1.5
9/19/13	0.22 J	1.56	6.0	1.4
12/13/13	0.19 J	1.99	2.16	0.72 J
3/10/14	0.18 J	1.98	2.24	1.8
7/8/2014	ND [0.2]	2.7	3.1	1.88
9/9/14	ND [0.2]	4.2	4.647	ND [0.5]
12/16/14	Frozen, not sampled			

BPSW-01

Date	Benzene	TAH	TAqH	TCE
3/16/11	ND	ND	ND	0.59 F
6/24/11	ND [0.2]	ND	0.2753 F	0.49 F
6/24/11	ND [0.2]	ND	0.0054 F	0.42 F
9/23/11	ND [0.2]	ND	ND	0.67 J
9/23/11	ND [0.2]	ND	0.0364 J	0.67 J
1/11/12	ND [0.2]	ND	0.01	0.85
3/27/12	ND [0.2]	2	2.22	0.67 B
6/25/12	ND [0.2]	2	2.2	1.4
8/16/12	ND [0.45]	2.7	2.91	0.94
12/18/12	ND [0.2]	2	2.18	0.83
3/11/13	ND [0.20]	2.0	2.18	0.32 J
7/1/13	ND [0.20]	2.0	2.18	0.87 J
9/19/13	0.15 J	1.58	1.75	0.77 J
12/12/13	ND [0.20]	2.0	2.18	0.41 J
3/10/14	ND [0.20]	1.44	1.63	0.53 J
3/10/14 FD	ND [0.2]	2	2.19	0.67 J,B
7/8/2014	ND [0.2]	2.7	3.1	0.93 J
7/8/14 FD	ND [0.2]	2.7	3.1	1.07
9/9/14	ND [0.2]	4.2	4.647	ND [0.5]
9/9/14 FD	ND [0.2]	4.2	4.651	ND [0.5]
12/16/14	ND [0.2]	2.7	3.2	0.77 J
12/16/14 FD	ND [0.2]	2.7	3.16	0.76 J

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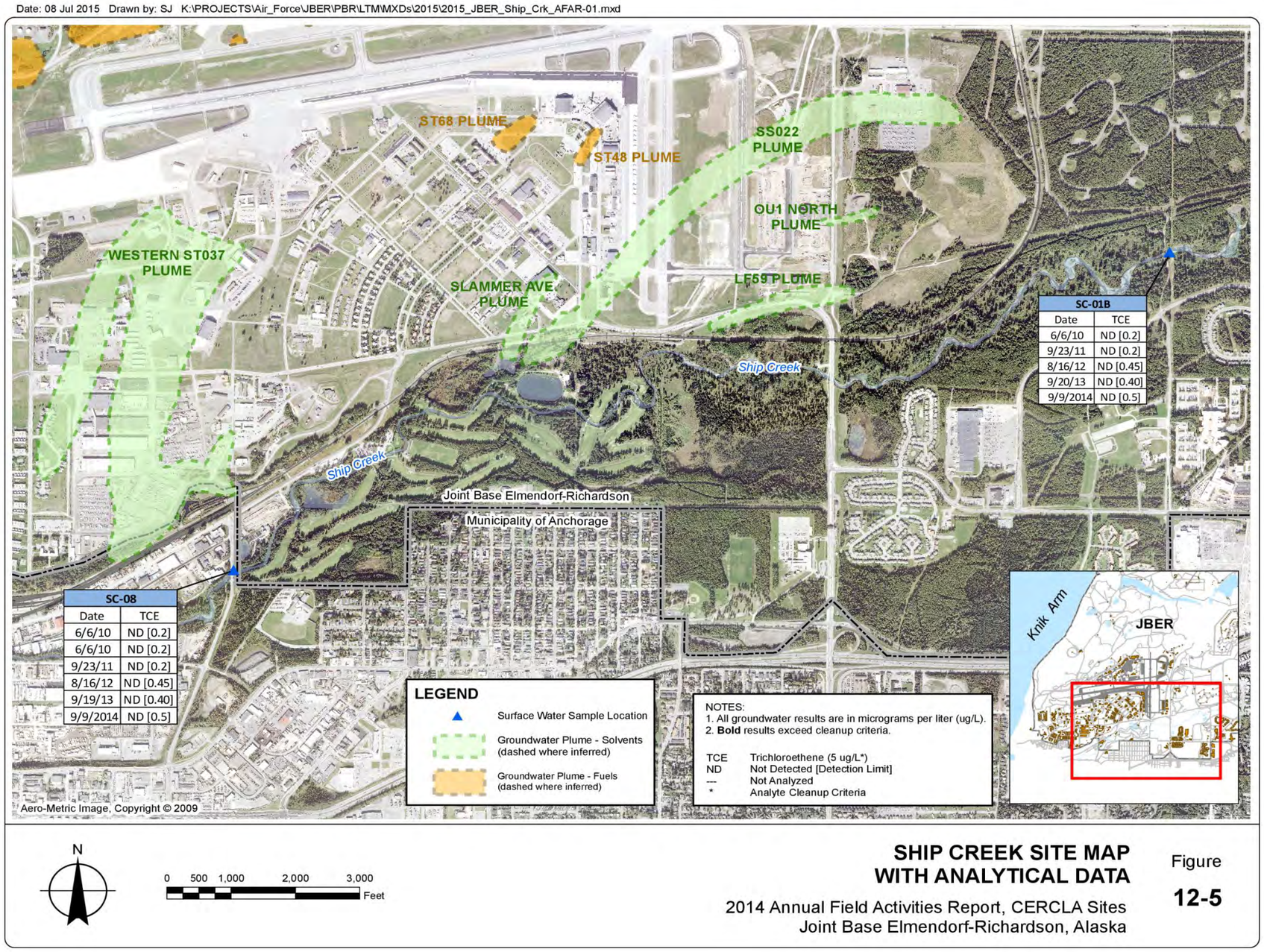
Figure 12-5 ST037 Ship Creek Site Map with Analytical Data



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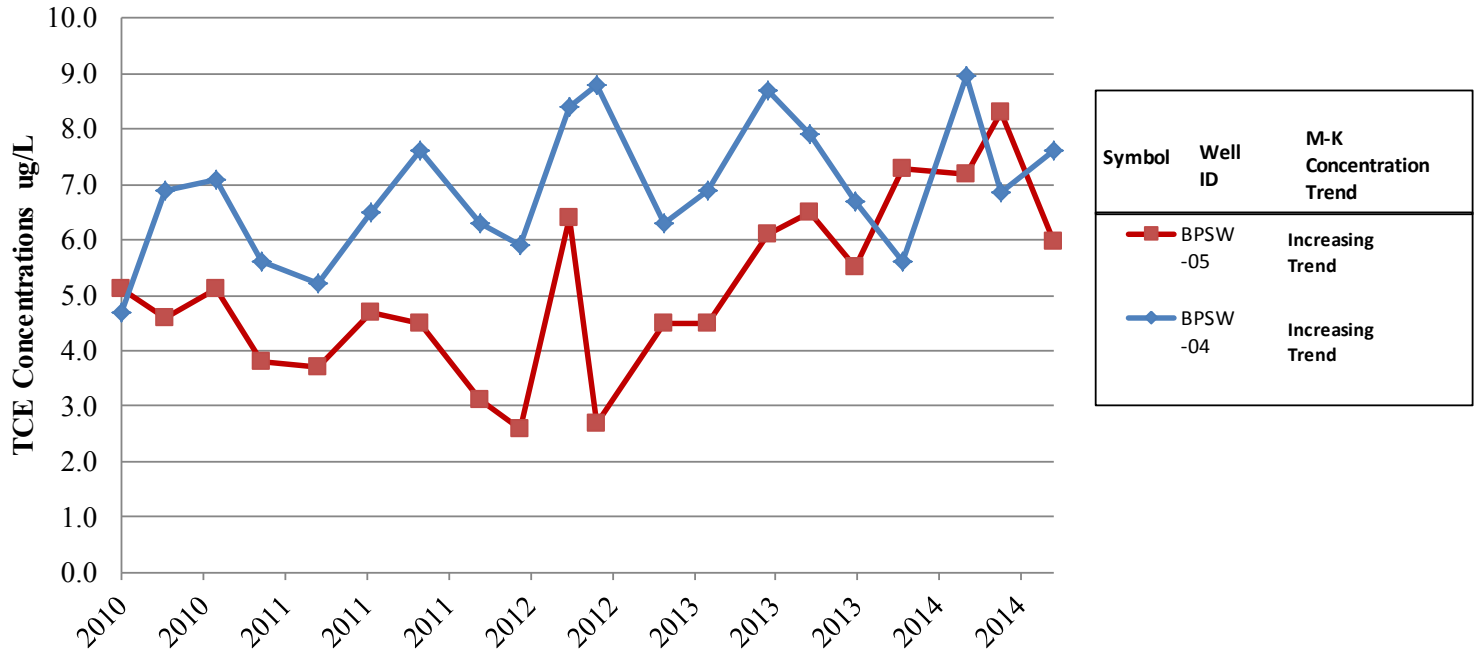
Graph 12-3 TCE Trends in Surface Water at the ST037 Beaver Pond



BEAVER POND TCE TRENDS IN SURFACE WATER

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Graph
12-3

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12.6 EARLY WARNING AND SENTRY WELL NETWORK

The Early Warning Well network at OU5 was established in 2001 to provide early detection of contaminant plumes that may impact Ship Creek or other downgradient environmental receptors. The Sentry Well network consists of 11 wells located downgradient of the Early Warning network and OU5 plumes (Figure 12-6). Specifically, the Early Warning and Sentry Well networks include the following:

- Early Warning wells: 516MW-02 (replacement of abandoned well 76WL-01), SP4/11-03, OU5MW-01, OU5MW-05, OU5MW-11, OU5MW-45. Well 76WL-01 was replaced in 2011 with well 516MW-02 due to damage beyond repair.
- Sentry wells: 401WL-03, 401WL-04, NS3-02, SP2/6-05, OU5MW-09, OU5MW-10, OU5MW-12, OU5-MW13, OU5-MW14, OU5MW-31, OU5MW-33.

The monitoring activities for the early warning and sentry wells are to track chlorinated VOC concentrations in groundwater and detect any contamination above OU5 ROD specified cleanup levels (5 µg/L for TCE). Groundwater sampling occurs in order to identify if contaminant concentrations increase to levels that would potentially impact environmental receptors, such as Ship Creek.

12.6.1 2014 Field Activities and Results

For the first semiannual sampling event, a Passive Diffusion Bag Sampler (PDBS) was placed in each Early Warning and Sentry Wells on 18 June, 2014. A PDBS was placed in well OU5MW-11 on 20 June 2014. A sample was collected from each PDBS on 9 July 2014. A PDBS was not placed in OU5MW-01. The well was either dry or an obstruction is in the well.

For the second semiannual sampling event, a PDBS was placed in each Early Warning and Sentry Wells on 15 October 2014 except for well OU5MW-10, which had a PDBS placed in it on 23 October and well OU5MW-46, which had a PDBS placed in it on 28 October, 2014. A PDBS was not placed in OU5MW-01 due to an obstruction is in the well. Instead the PDBS was placed in OU5MW-46. Each PDBS was placed in the well in the middle of the screened water column. A sample was collected from each PDBS on 12 November, 2014. All groundwater samples collected from these wells were submitted to an analytical laboratory for analysis of VOCs.

In 2014, TCE concentrations from the Early Warning and Sentry Wells that were sampled were all below the groundwater cleanup level of 5 µg/L. Current and historical results are presented on Figure 12-6 and in Appendix C.

12.6.2 Early Warning and Sentry Wells Site Summary and Recommendations

Analytical samples collected from Early Warning and Sentry wells in 2014 were all below the OU5 ROD cleanup level for TCE. It is recommended that well OU5MW-46 replace OU5MW-

01 in the monitoring program. Well OU5MW-46 is located approximately 10 feet down gradient of OU5MW-01

12.7 SITE SUMMARY AND RECOMMENDATIONS

The rate of TCE degradation at the site is low. The attainment of cleanup goals at this site will likely occur primarily as a result of other natural attenuation mechanisms including dispersion, adsorption, and dilution. Recommendations from the 2010 investigation include use of in situ treatment of contaminated groundwater by injection of chemicals that degrade TCE, excavation of shallow vadose zone source areas (if identified), and/or soil vapor treatment for deeper vadose zone source areas may be appropriate to reduce the remediation timeframe for source areas where current or future TCE concentration data indicate that remediation goals will not achieve cleanup levels within an acceptable timeframe.

12.7.1 Five-Year Review

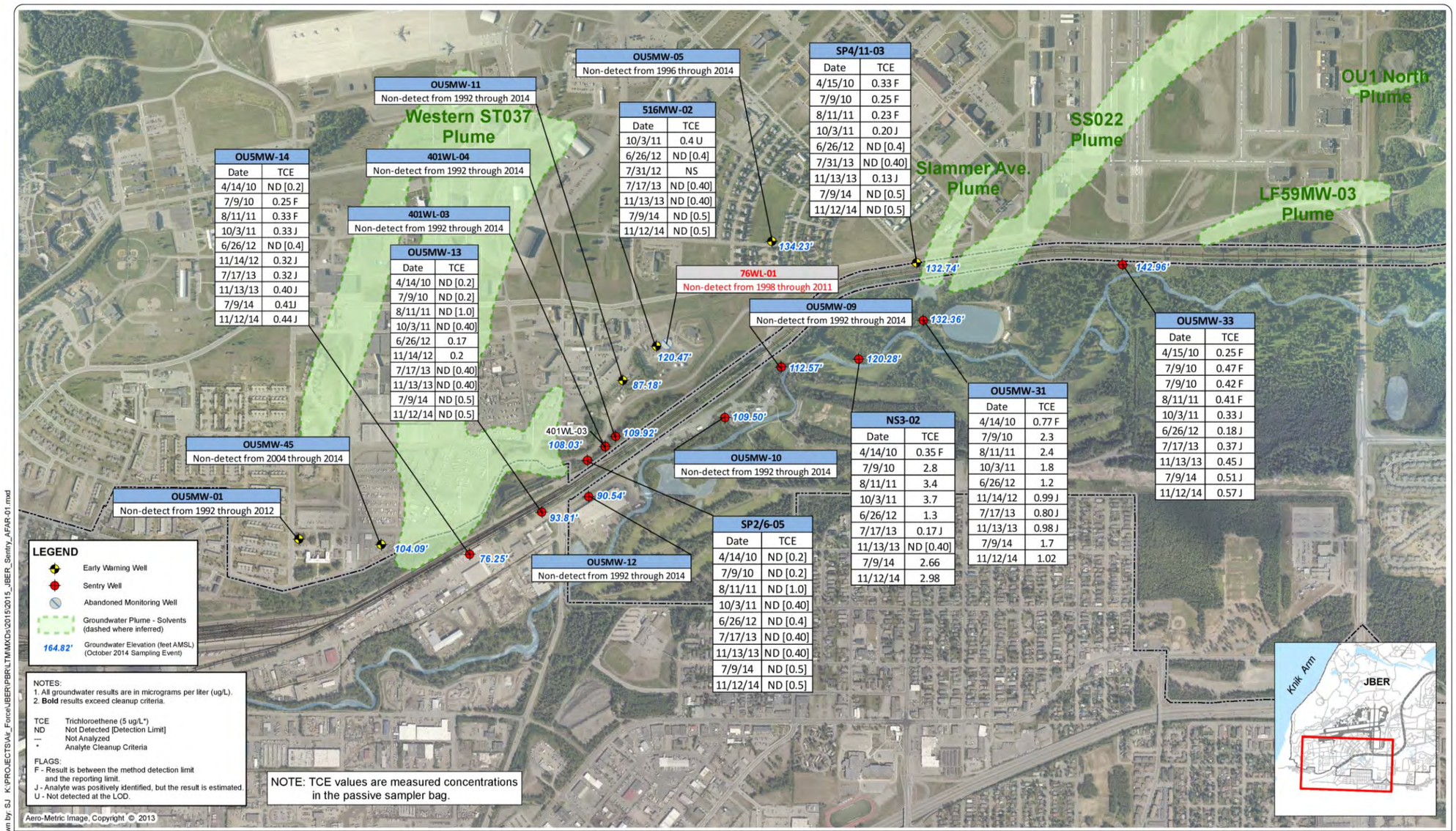
Areas in OU 5 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for ST037 documented during the first five-year review (USAF, 1998c). The second five-year review recommended re-sampling of well OU3MW-25 (OU3MW-25 plume) to confirm that TCE concentration remain below the cleanup level. If confirmed, prepare a memorandum to site file to document that sampling for this plume should be discontinued (USAF, 2003c). The third-five year review recommended sampling for 1,4-dioxane to identify if concentrations exist at a level that presents an unacceptable risk. The review also recommended optimization of early warning and sentry monitoring well networks in order to eliminate wells that are not downgradient of plumes and consider additional wells where there is a greater probability of contaminant migration (USAF, 2008c). The fourth five-year review recommended optimization of the early warning and sentry monitoring well network and optimization of the groundwater monitoring network as recommended by the ST037 TCE Plume and Source Area Investigation report (USAF, 2011b). The review also recommended that OU5 seep locations be verified and clearly marked to ensure appropriate sampling in the future (USAF, 2014e).

12.7.2 Recommendations

In 2014, seep locations at OU5 were resurveyed and marked. Based on the results of the 2010 investigation, five-year reviews and 2014 program sampling the following recommendations are made for the ST037 site:

- Optimize the groundwater monitoring network at OU5 as recommended in the ST37 TCE Plume and Source Area Investigation Report (USAF, 2011b).
- It is recommended for sample frequency to remain quarterly at the Beaver Ponds. An update to the sample frequency will be provided in the 2015 CERCLA report following the OU5 Memorandum to Site File- Well Sampling Frequency Decision Guide.

Figure 12-6 ST037 Early Warning and Sentry Wells Site Map with Analytical Data



EARLY WARNING AND SENTRY WELLS MONITORING SITE MAP WITH ANALYTICAL DATA

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Figure **12-6**

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13.0 ST041

PBC Performance Objective: Design and Implement an Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

13.1 SITE DESCRIPTION

JBER-Elmendorf Site ST041 (known as Four-Million Gallon Hill) is an approximately 20-acre site that is located east of the Knik Arm and north of Fairchild Avenue (Figure 13-1). In 1942, four one-million gallon USTs were installed and used to store aviation fuel for flight line operations. In 1991, these tanks were taken out of service. During the mid-1960s, an estimated 60,000 gallons of aviation gasoline spilled and in 1974 a UST was overfilled spilling 33,000 gallons of JP-4. No fuel was recovered from the gasoline spill, but 16,000 gallons of fuel were recovered from the JP-4 spill; the remainder infiltrated into the ground northwest of the tanks. Presently, two groundwater plumes (ST041 North and ST041 South) are tracked at the site (Figure 13-1).

13.2 REGULATORY REQUIREMENTS

The remedy identified in the OU2 ROD for ST041 included free-product collection from groundwater and surface water, LTM of residual contamination in groundwater and surface water to cleanup levels in 21 years or less, and maintenance of LUCs to restrict groundwater development (USAF, 1995a). Free-product collection systems operated in the ST041 North plume from 1997 to 1999, after which collection activities ceased because recovery rates had diminished to negligible levels.

The OU2 ROD identified BTEX as the groundwater monitoring COC at ST041, but by 1998 cleanup levels were met for toluene and xylenes, leaving benzene and ethylbenzene as the remaining groundwater COCs. However, in the ST041 South plume, toluene is still present above cleanup levels. The OU2 ROD identified only benzene, toluene, and ethylbenzene as the surface water monitoring COCs. The sum of benzene, toluene, xylene, and ethylbenzene results must also be below the cleanup level (10 µg/L) to meet surface water quality levels for TAH (USAF, 1995a).

Current monitoring requirements at ST041 include periodic groundwater, seep, and surface water sampling and an annual LUC inspection. Groundwater sampling is required for the above COCs at groundwater monitoring wells ST41-16 (annually), ST41-25 (annually), ST41-10R (every two or three years), ST41-20 (every five years), ST41-28 (annually), ST41-30 (every five years), and ST41-34 (every five years). Seep ST41SP-01 is required to be sampled for site COCs every five years and surface water location ST41SW-13 annually. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

13.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, two groundwater monitoring wells from the North Plume (ST41-10 and ST41-28) and two from the South Plume (ST41-25 and ST41-16) were sampled for BTEX compounds. One field duplicate sample was collected from well ST41-28. In addition, one surface water sample was collected and sampled for BTEX compounds from a surface water sample location downgradient of the North Plume (ST41SW-13).

Concentrations of benzene exceeded the OU2 ROD cleanup level for groundwater monitoring wells ST41-10R (49 µg/L), ST41-16 (5,950 µg/L), ST41-25 (24.3 µg/L), and ST41-28 (90 µg/L). Concentrations of ethylbenzene exceeded the OU2 ROD cleanup level for groundwater monitoring wells ST41-16 (1,760 µg/L) and ST41-28 (766 µg/L). Groundwater well ST41-16 also exceeded the OU2 ROD cleanup levels for toluene (7,190 µg/L). Contaminants of concern did not exceed the cleanup level at the surface water point of compliance (ST41SW-13). Table 13-1 presents a summary of the results. Current and historical results are presented on Figure 13-1 and in Appendix C.

Field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are included in Appendix A. Field parameters in the ST041 South plume in 2014 were similar to those observed in previous years. DO in wells ST41-10R and ST41-16 was higher than in previous events; but the MNA parameters in monitoring wells ST41-10R, ST41-16, and ST41-25 showed low DO and reducing ORP. These results are indicative of a reduced environment due to microbial decay of hydrocarbons, consistent with in-plume conditions for fuel spills. The well purged dry when sampling the north plume well ST41-28, field parameters were collected when a grab sample was collected the next day and were consistent with a reducing environment. Appendix A presents the field parameters for the ST041 site.

Well maintenance was performed at two wells, ST41-10R and ST41-25; the well casings were cut down and resurveyed in 2014.

A LUC inspection was performed for ST041 on 26 September 2014 and did not identify any issues. A copy of the 2014 LUC inspection form for ST041 is provided in Appendix B.

Table 13-1 Summary of 2014 Analytical Results at ST041

Analyte	Cleanup Level[1]	ST41-10R	ST41-16	ST41-25	ST41-28	ST41-28 FD	ST41SW-13
Benzene	5	**49**	**5950**	**24.3**	**90**	**102**	ND [0.2]
Ethylbenzene	700	144	**1760**	39	**766**	634	ND [0.5]
Toluene	1,000	1.27	**7190**	3.9	ND [50]	41.0 J	ND [0.5]
Xylenes	10,000	308	8890	10.6	2190	1950	ND [1.5]
TAH	10	**502.27**	**23,790**	**77.8**	**3077**	**2727**	1.74

Notes:

[1] Cleanup levels as cited in OU2 ROD (USAF, 1995a)
Bold result exceeds cleanup level.
J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
ND = non-detect (limit of detection)
µg/L = micrograms per liter
B = The analyte was detected in an associated method and/or calibration blank.

13.4 SITE SUMMARY AND RECOMMENDATIONS

During 2014, all four of the groundwater monitoring wells sampled had concentrations of contaminants that exceeded cleanup levels cited in the OU2 ROD. The Mann-Kendall trend tests for benzene in wells ST41-10R, ST41-16, ST41-25 and ST-28, ethylbenzene in wells ST41-16, ST41-25 and ST41-28, toluene in wells ST41-10R, ST41-16 and ST41-28 and xylene in well ST41-25 indicated statistically significant decreasing trends at the 95% confidence level. No statistically significant trends were identified for benzene, ethylbenzene, toluene, xylene or TAH in the surface water location ST41SW-13, toluene in well ST41-25 or xylene in wells ST21-10R, ST41-16, or ST41-28.

Site ST041 is identified as a **Yellow** priority since contaminant concentrations continue to exceed ROD cleanup levels but do not show an increasing trend.

13.4.1 Five-Year Review

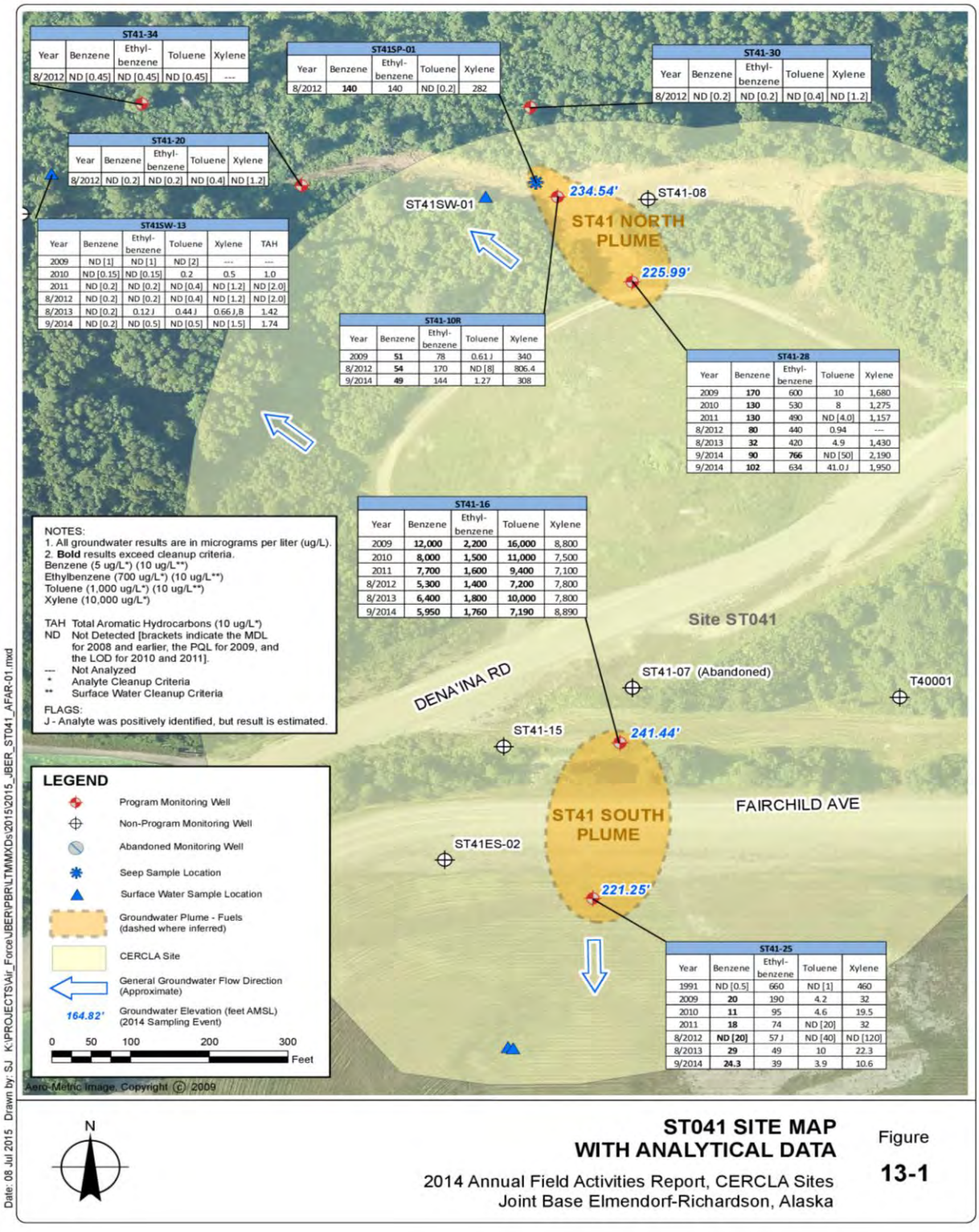
Areas in OU 2 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. There were no recommendations for ST41 documented during the first or second five-year review period (USAF, 1998c; USAF, 2003c). The third five-year review report recommended that surface water point of compliance (SW-13) be monitored annually and seep ST41SP01 every five years to assess the natural attenuation remedy for OU2 surface water. It was also recommended that wells ST41-28 (North Plume) and ST41-16 (South Plume) were incorporated back into the monitoring program for OU2 when free product is no longer present in these wells and reduce the sampling frequency or eliminate well ST41-07 because cleanup levels appear to be met at this location. The fourth five-year review report recommended that maintenance be performed on monitoring well ST41-25, which showed signs of frost heaving during site inspection activities and reevaluate the sampling frequency for monitoring well ST41-10R based on the decision

guide for monitoring well sampling frequency at OU2 provided in the *2011 Memorandum to the Site File: Operable Unit 2* (USAF, 2014e)

13.4.2 Recommendations

It is recommended to keep sample frequency consistant for 2015. It is also recommended, in 2015, to inspect well ST41-25 for frost heaving and assess sample frequency per the sample frequency gide provided in the *2011 Memorandum to the Site File: Operable Unit 2* (USAF, 2014e).

Figure 13-1 ST041 Site Map with Analytical Data



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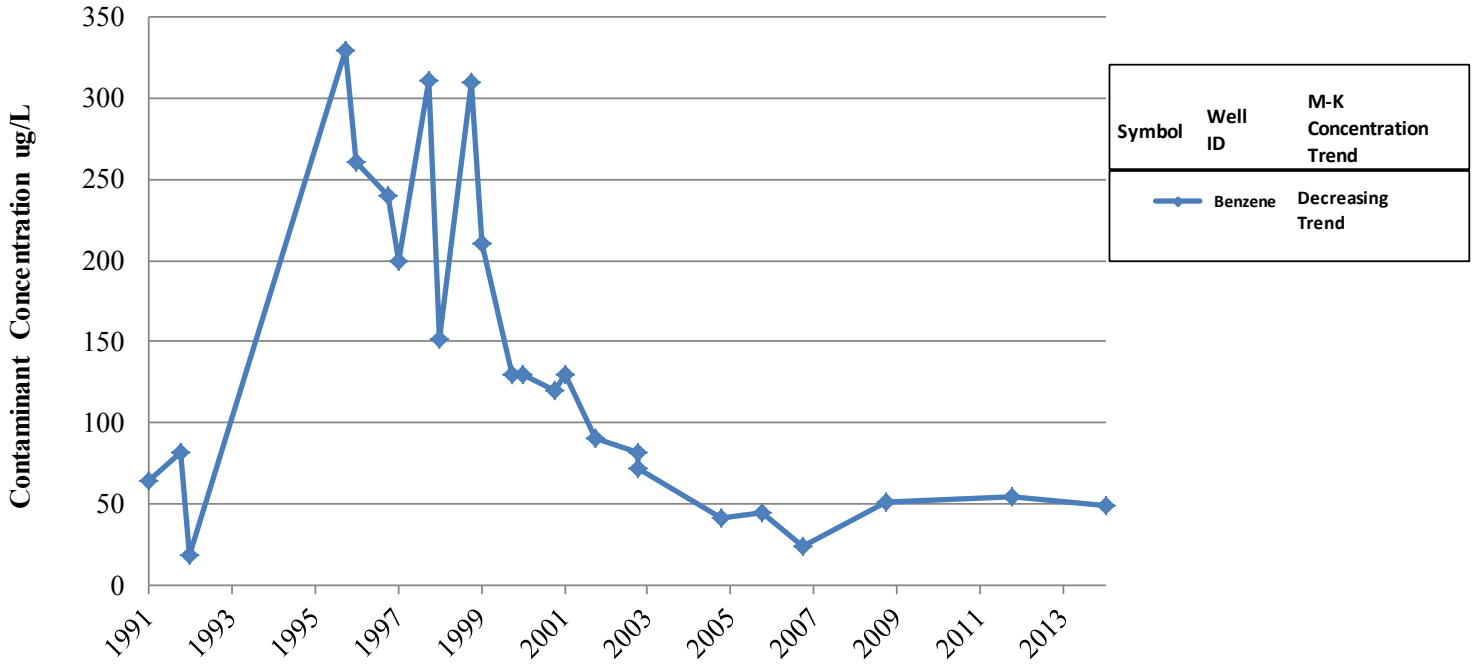
Graph 13-1 ST041 Contaminant Trends in ST41-10R



ST041 BENZENE TREND IN ST41-10R

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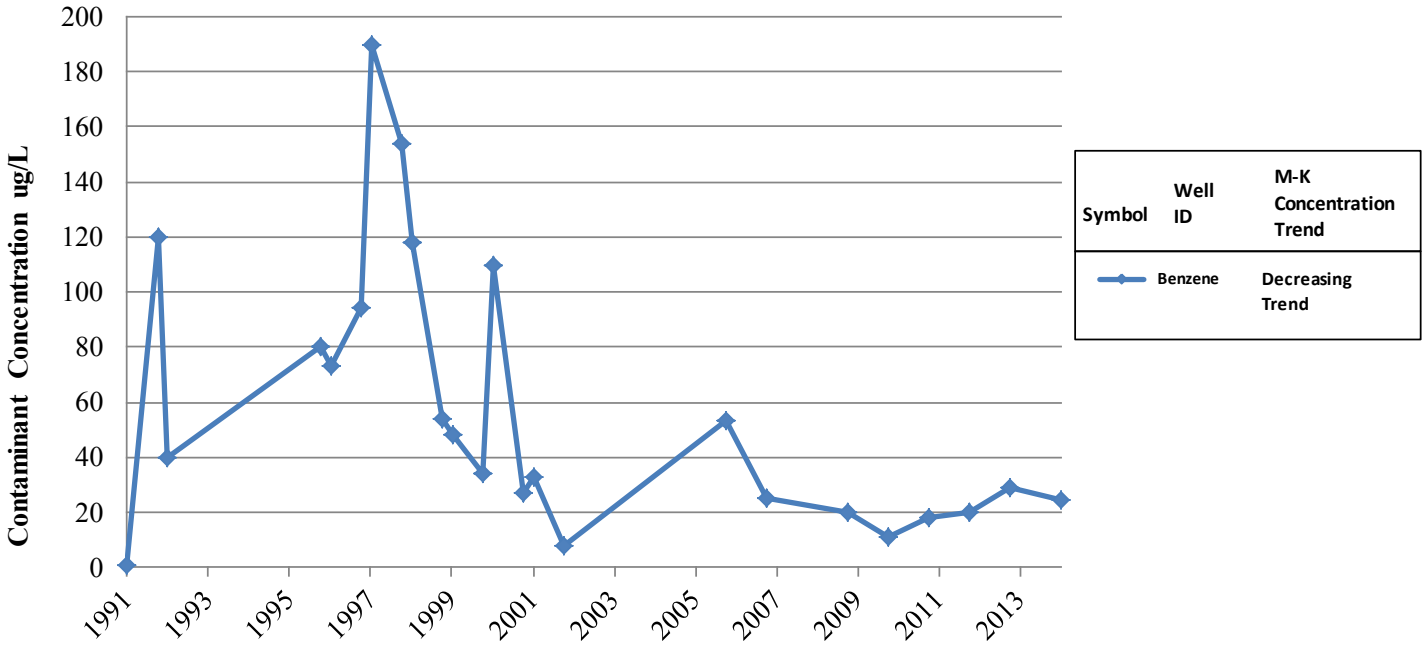
Graph
13-1

Graph 13-2 ST041 Benzene Trend in ST41-25



ST041 BENZENE TREND IN ST41-25

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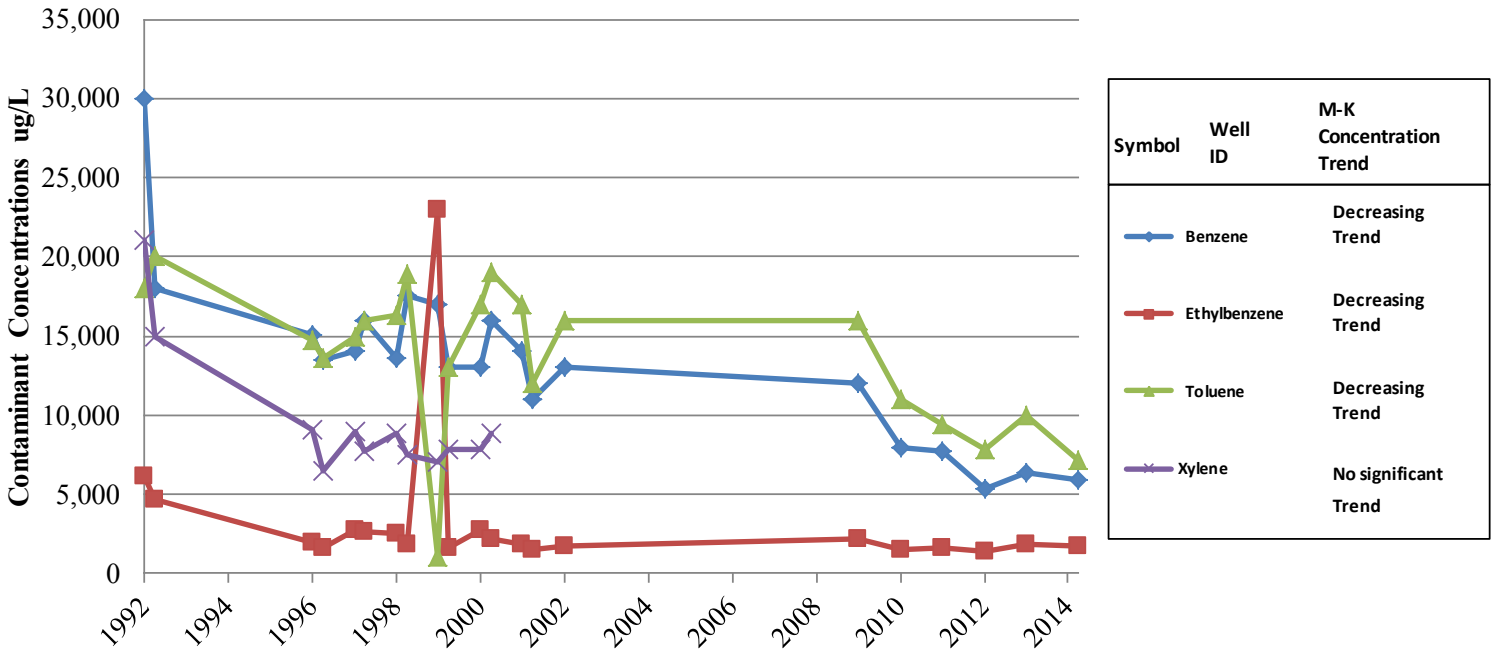
Figure
13-2

Graph 13-3 ST041 Contaminant Trends in ST41-16



ST041 CONTAMINANT TRENDS IN ST41-16

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Figure
13-3

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14.0 WP014

PBC Performance Objective: Design and Implement an Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

14.1 SITE DESCRIPTION

JBER-Elmendorf Site WP014 is a 400-ft by 300-ft area located a few hundred feet east of LF004 South (Figure 14-1). Petroleum hydrocarbon contamination at this site originated between 1964 and 1968 when the area was used for fuel tank sludge disposal generated from POL tank cleaning operations. Fuel filters and pads were also weathered on the ground surface in a broad area of vegetated soil. Local soil was reportedly used to cover the site after disposal operations ceased. Soil and groundwater contamination may also be associated with the former PL081 Valve Pit 11, which is approximately 100 ft east of WP014. The former location of PL81 Valve Pit 11 was excavated in 2005, as outlined in the PL081 DD (USAF, 2005b).

Two plumes (WP014 and OU6MW-46) are managed within WP014 (Figure 14-1). The WP014 plume encompasses groundwater contamination derived from WP014 and PL081. The plume migrates westerly towards LF004 and discharges at two seeps overlooking Knik Arm, a distance of approximately 1,000 ft from the WP014 and PL081 source areas. The PL081 DD states that all groundwater contamination attributable to PL081 will be managed by the OU6 ROD. Therefore, groundwater contamination associated with PL081 is monitored as part of the LF004 South and WP014 groundwater monitoring program. The second plume (OU6MW-46) is a smaller plume cross-gradient from the WP014 source area and is monitored with one well (OU6MW-46) in a perched groundwater aquifer.

14.2 REGULATORY REQUIREMENTS

Groundwater will be monitored as indicated by the Decision Guide in Attachment 1 of the *OU6 Memorandum to the Site File* (USAF, 2003d) and evaluated on an as-needed basis to determine contaminant migration and to track the progress of contaminant degradation and dispersion, as well as to provide an early indication of unforeseen environmental or human health risk. Five-year reviews will also assess the protectiveness of the remedial action, including an evaluation of any changed site conditions.

The COCs for groundwater at WP014 consist of benzene, ethylbenzene, and toluene, which have cleanup levels of 5 µg/L, 700 µg/L, and 1000 µg/L, respectively, as presented in the OU6 ROD (USAF, 1997b).

Groundwater sampling is required for the site COCs at groundwater monitoring wells OU6MW-46 (every two years), 14MW-120 (every five years), 14MW-121 (every five years), OU6MW-13 (every five years), OU6MW-91 (every two years), OU6MW-92 (annually), and OU6MW-93 (annually). Quarterly seep sampling is required for the above COCs at seeps LF04SP-03 and

LF04SP-04. LUCs are in place to prevent access and exposure to contaminated groundwater and soil at the site.

14.3 2014 FIELD ACTIVITIES AND RESULTS

During 2014, groundwater monitoring wells OU6MW-67, OU6MW-92, and OU6MW-93, and seeps LF04SP-03 and LF04SP-04 were sampled for VOCs. One field duplicate sample was collected from OU6MW-93. LF04SP-03 and LF04SP-04 were sampled quarterly. Concentrations of benzene exceeded the OU6 ROD cleanup levels in two of the three wells sampled. Concentrations of benzene also exceeded the OU6 ROD cleanup levels in seep LF04SP-03 during the first and fourth quarter and seep LF04SP-04 in the third and fourth quarter. Table 14-1 presents a summary of the results. Historical results are presented on Figure 14-1.

Field parameters measured at the time of sample collection including the field measured biogeochemical MNA parameters; pH, conductivity, DO, and ORP are included in Appendix A. The low DO and reducing ORP measured in wells OU6MW-67 and OU6MW-93 are consistent with in-plume conditions for fuel spills and are indicative of a reducing environment due to microbial decay of hydrocarbons. Well OU6MW-92 purged dry during sampling, field parameters were not measured when a grab sample was collected the following day. Appendix A presents the field parameters for the WP014 site.

A LUC inspection was performed for WP014 on 26 September 2014 and identified damage to well OU6MW-05; however this well is not a part of the monitoring program. A copy of the 2014 LUC inspection form for WP014 is provided in Appendix B.

Table 14-1 Summary of 2014 Analytical Results at WP014

Analyte	Cleanup Level[1]	OU6MW-67	OU6MW-92	OU6MW-93	OU6MW-93 (FD)	LF04SP-03 (Q1)	LF04SP-03 (Q2)
Benzene	5	**8.22**	**46.3**	0.22	0.210 J	4.3	**14.8**
Ethylbenzene	700	2.48	518	ND [0.5]	ND [0.5]	ND [0.20]	ND [0.5]
Toluene	1,000	ND [0.5]	6.72	ND [0.5]	ND [0.5]	ND [0.50]	ND [0.5]
Analyte	**Cleanup Level[1]**	**LF04SP-03 (Q3)**	**LF04SP-03 (Q4)**	**LF04SP-04 (Q1)**	**LF04SP-04 (Q2)**	**LF04SP-04 (Q3)**	**LF04SP-04 (Q4)**
Benzene	5	0.340 J	3.29	2.7	0.380 J	**5.12**	**5.03**
Ethylbenzene	700	ND [0.5]	ND [0.5]	6.9	0.870 J	16.2	ND [0.5]
Toluene	1,000	ND [0.5]	ND [0.5]	0.41 J	ND [0.5]	ND [0.8]	0.71 J

Notes:

[1] =Cleanup levels as cited in the OU6 ROD (USAF, 1997b).
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
FD = field duplicate
ND = non-detect (limit of detection)
NS = not sampled
Bold result exceeds the cleanup level.
µg/L = micrograms per liter

14.4 SITE SUMMARY AND RECOMMENDATIONS

The 2014 monitoring results are consistent with the plume defined in the shallow aquifer extending from the WP014 site to points of discharge at seeps LF04SP-03 and -04 on the bluff overlooking Knik Arm. Presently, dissolved benzene concentrations are probably maintained by the ongoing dissolution of residual product in the contaminated smear zone and will continue to be present at similar levels until the residual product attenuates and disappears.

Downgradient of the WP014 plume (in the northern portion of the LF004 South plume area) COCs in seep LF04SP-03 show variability over time. The benzene level was above the cleanup levels during two of four quarterly samples in 2014. In 2013 the benzene concentration in seep LF04SP-04 was above the cleanup level for the first time since 2007; therefore this seep was sampled quarterly. In 2014 the benzene concentration continued to exceed the cleanup level in the third and fourth quarters. The seeps are expected to continue to exhibit variability in benzene concentrations while the core of the WP014 plume attenuates and possibly migrates westward. According to the Decision Guide in Attachment 1 of the *OU6 Memorandum to the Site File* (USAF, 2003d), seeps that exceed cleanup level should be sampled quarterly. It is therefore recommended that seep LF04SP-04 be sampled quarterly in 2015.

Upgradient of the WP014 plume, the sources have been removed and no additional upgradient sources are anticipated. The remaining contaminants appear to have moved past monitoring well 14MW-120 in 2007, suggesting it is on the upgradient edge of the plume. Current observations are consistent with the hypothesis that product remains in the contaminated smear zone at residual saturation and is now generally immobile and degrading and dissolving in place (USAF, 2008b). Contaminant fluctuations in the in-plume monitoring wells will continue as varying water levels control the degree of interaction with the contaminated smear zone, and minor mobility of residual product can lead to the accumulation of free product in monitoring wells.

The Mann-Kendall trend tests for benzene in well OU6MW-67 and seep LF04SP-03, ethylbenzene in well OU6MW-67, and toluene in wells OU6MW-67 indicated statistically significant decreasing trends at the 95% confidence level. No statistically significant trends were identified for benzene and ethylbenzene in wells OU6MW-92 and OU6MW-93, ethylbenzene in seep LF04SP-03, benzene or toluene in seep LF04SP-04, and toluene in well OU6MW-93. While the Mann-Kendall trend test for toluene in seep LF04SP-03 indicated an increasing trend, high censoring (only three detections) makes the trend analysis unreliable and thus is considered not to be significant. Graph 14-1 presents the benzene trend in seep LF04SP-03. Contaminant trends for well OU6MW-67 are presented in Section 6.0.

14.4.1 Five-Year Review

Areas in OU 6 that remain above cleanup goals are required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review

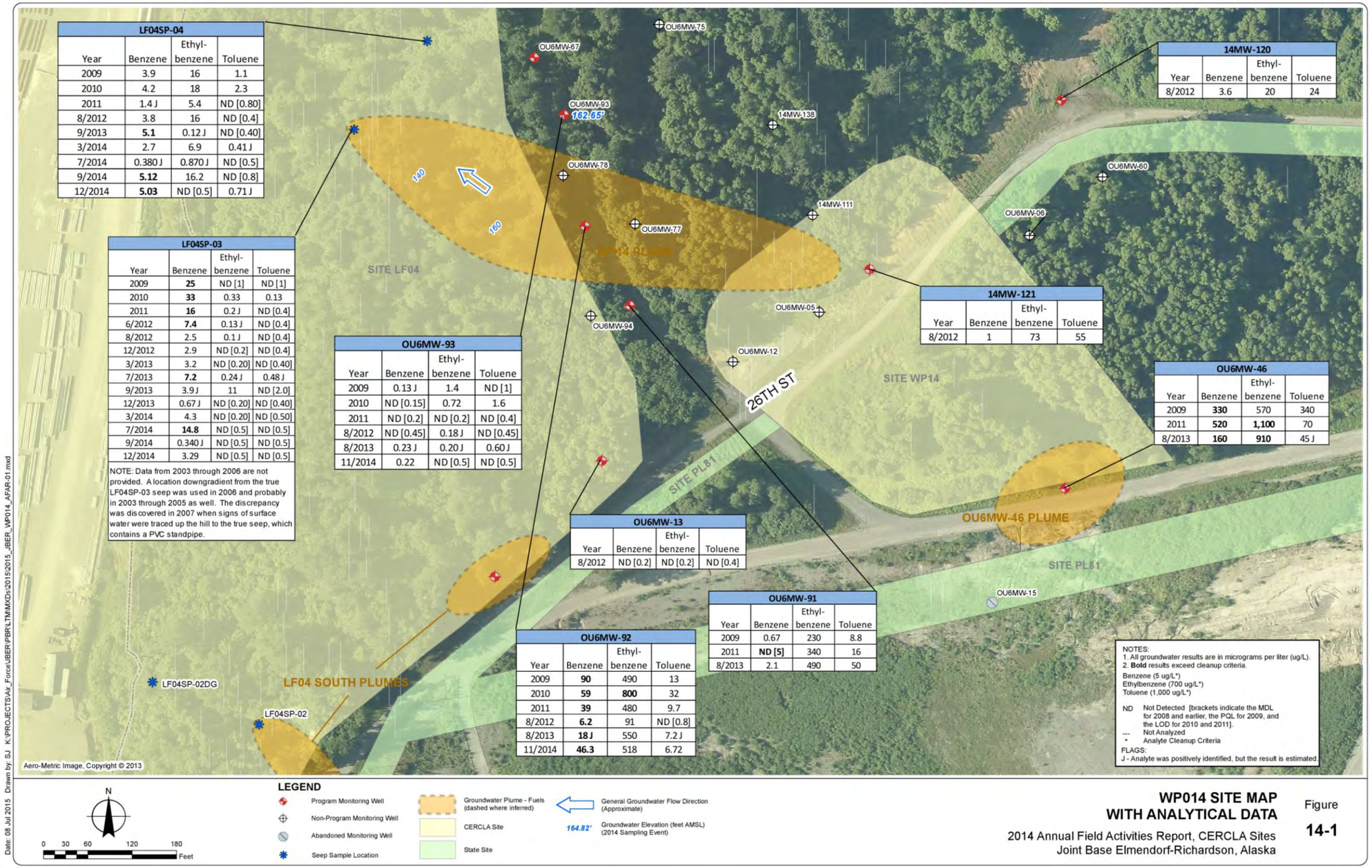
is to evaluate the implementation and performance of the remedial actions. There were no recommendations for WP014 documented during the first or second five-year review period (USAF, 1998c; USAF, 2003c). The third five-year review report recommended monitoring well OU6MW-77 be incorporated back into the monitoring program for WP14 once free product is no longer present in the well (USAF, 2008c). The fourth five-year review recommended groundwater sampling for 2-methylnaphthalene to determine if current concentrations present an unacceptable risk. (USAF, 2014e)

14.4.2 Recommendations

Site WP014 is identified as a **Yellow** priority since contaminant concentrations continue to exceed ROD cleanup levels but do not show a statistically increasing trend. Well OU6MW-67 exhibited a benzene concentration of 5.2 µg/L that exceeded the OU6 ROD in 2013 after being below the cleanup level since 1999; therefore it was recommended to be sampled in 2014 even though the well was not due to be sampled until 2015. Results from 2014 exhibited an increase in concentration (8.22 µg/L). This well is also used to monitor groundwater at LF004. It is recommended that this well be sampled annually to determine if contaminant concentrations are increasing. It is also recommended that product levels are checked annually at OU6MW-77. In 2016 groundwater well OU6MW-46 will be sampled for 2-methylnaphthalene in addition to VOCs, as recommended in the fourth five-year review.

Additional characterization work for 2015 is being conducted at the WP014 site under the *WP014 UFP-QAPP Limited Site Investigation Work Plan* (USAF, 2015d). The results of the Limited Site Investigatation are anticipated to be finalized in 2016, additional recommendations will be provided after the results are evaluated.

Figure 14-1 WP014 Site Map with Analytical Data



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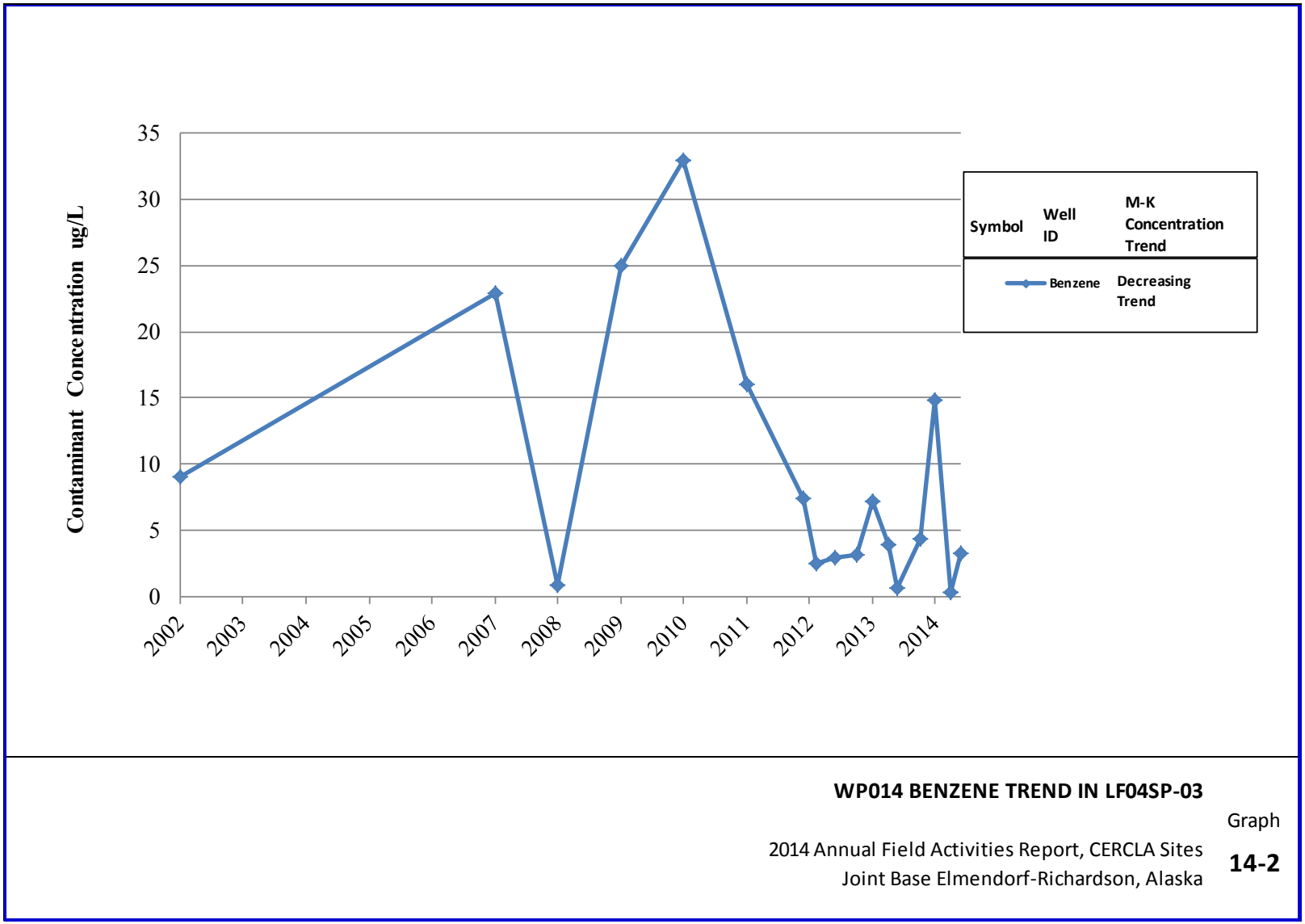
Graph 14-1 WP014 Benzene Trend in LF04SP-03



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15.0 CG039 (POLELINE ROAD DISPOSAL AREA)

PBC Performance Objective: Design and Implement an Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2020

15.1 SITE DESCRIPTION

CG039 – Poleline Road Disposal Area (formerly known as FTRS-39) is located approximately 1.1 miles southwest of Eagle River (see Figure 1-1). The land is a restricted access site, currently used for training activities and recreational purposes. Groundwater and soil contamination at the site resulted from the historical activities associated with four chemical disposal areas that were used from 1950 to 1972. During this time, chemical agent identification sets (CAIS) and other military debris were burned and disposed of in trenches. Chlorinated solvents were used to neutralize the chemical agents in the CAIS. A Rapid Response Removal Action within two of the four areas (A-3 and A-4) occurred from 1993 to 1994, during which time buried debris and soil were excavated to a maximum depth of 14 feet. The remaining two areas (A-1 and A-2) have not been excavated because they are suspected to contain buried munitions [United States Army Corps of Engineers (USACE), 1996]. For additional site information, including previous investigations, see the Environmental Restoration Program 2011 Groundwater Monitoring and Borehole Sampling, Three-Party Agreement Sites: OUB Poleline Road Disposal Area and OUE Armored Vehicle Maintenance Area (USAF, 2012b).

15.1.1 Site Geology

CG039 is located within a lowland area with complex geology resulting from periods of repeated glaciation. Glacial sediments and glacial tills make up the aquifer material beneath the site, which consists of a range of material from clay to boulders (Woodward-Clyde, 1998). The unconsolidated material at the site was reworked by prehistoric glacial-melt-water rivers, resulting in the complex distribution of laterally and vertically discontinuous layers and lenses observed at the site (USACE Cold Regions Research and Engineering Laboratory [CRREL], 2003). Bedrock was encountered at a depth of approximately 70 feet bgs in borings in the southern portions of the site and at approximately 190 feet bgs in borings north of the site.

15.1.2 Site Hydrology

The nearest surface water is an unnamed wetland area located upgradient of CG039 approximately 255 feet to the southwest. The nearest downgradient surface water, Eagle River, is located approximately 1.2 miles northwest of the site. No significant surface water runoff or sediment transport from the site was observed.

15.1.3 Site Hydrogeology

Groundwater flowing in and adjacent to the main disposal area has been the ongoing subject of study and is fairly well documented in both the shallow and deep groundwater aquifers (USACE

CRREL, 2000; USACE CRREL, 2003; and USACE CRREL, 2011). The groundwater hydraulics at the site are driven primarily by recharge from the wetland area and secondarily from surface infiltration across the site. Water infiltrating from the wetland area recharges both the shallow and deep saturated intervals because of the leaky nature of the aquitard in the area of the wetlands. Although the unconsolidated material over the bedrock is considered quite heterogeneous, several hydrostratigraphic units have been identified.

There is no current use of groundwater as a drinking water source at the site. The nearest JBER water supply well is a standby drinking water well and is located approximately 5.6 miles southwest of the site.

15.1.3.1 Shallow Aquifer

The upper, shallow aquifer is present from ground surface to a depth of approximately 40 feet bgs. This interval consists primarily of silty sands and gravels with frequent, discontinuous silt and clay lenses. The silt and clay lenses act as barriers to vertical flow, creating zones of perched groundwater. The shallow aquifer is normally saturated from approximately 20 to 40 feet bgs.

15.1.3.2 Intermediate Aquitard

The intermediate aquitard is consists of poorly sorted and silt-rich sand and gravel (USACE CRREL, 2003). The material has been previously described as a basal till (Woodward-Clyde, 1998) and diamicton (USACE CRREL, 2003). The intermediate interval is lithologically similar to the shallow aquifer but considerably denser (Woodward-Clyde, 1998). Although the intermediate interval serves as somewhat of a barrier, hydraulic gradients suggest that downward flow is occurring through the intermediate interval from the shallow aquifer to the deep perched aquifer. Perched water zones have been encountered during drilling through the intermediate zone.

15.1.3.3 Deep Perched Aquifer

The deep perched aquifer is located at the base of the till aquitard that locally perches groundwater extending from approximately 95 to 126 feet bgs. This till is referred to as an aquifer because it has enough water to sample in some places; however, the area is more characteristic of an aquitard (USACE CRREL, 2011). It is most closely associated with the previously described intermediate aquitard. The deep perched aquifer is located above a layer of laminated glacial silt (termed the "basal silt") or directly on the bedrock surface. The deep perched aquifer produces only small volumes of water and has little seasonal water-level variation, suggesting that this aquifer is not directly hydraulically connected to the shallow or regional aquifers. Groundwater and contaminants seep slowly through the till until they reach the bedrock or basal silt layer where a thin layer of perched groundwater is present. It is not known whether there is a pathway between the deep perched aquifer and the regional aquifer, although

based on the lack of groundwater variation, it is presumed that the mechanism of this connection would be a slow diffusive process through the low-permeability till (USACE CRREL, 2011).

15.1.3.4 Regional Aquifer

The regional aquifer is the primary aquifer across the Anchorage Bowl where groundwater migrates from the base of the Chugach Mountains toward Knik Arm. At CG039, the regional aquifer underlies the shallow aquifer and deep perched aquifer at depths of approximately 140 to 190 feet bgs. The flow direction in the regional aquifer is northwest according to groundwater elevation data at Poleline Road. Groundwater elevations within this aquifer fluctuate annually, with the highest levels in the fall or early winter months. This aquifer contains the most groundwater of the three aquifers discussed here and likely has the greatest flow velocities. Although the groundwater velocity of the regional aquifer has not been measured at Poleline Road, groundwater velocities from regional aquifer wells nearby on the JBER-R Main Cantonment area average 1.6 to 2.5 feet per day, according to data collected from USACE CRREL groundwater flow systems installed in regional aquifer monitoring wells (USACE CRREL, 2000). Average bulk hydraulic conductivities at Poleline Road were estimated by Woodward-Clyde (1996) to range from 0.03 to 284 feet per day, and were estimated by USACE CRREL (2003) to range from 0.6 to 121 feet per day.

15.2 REGULATORY REQUIREMENTS

CG039 was included in the Operable Units A and B ROD (U.S. Army, et al., 1997). As identified in the ROD, COCs in soil include PCE, and 1,1,2,2-PCA; COCs in groundwater include benzene, carbon tetrachloride, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, and 1,1,2,2-PCA.

High-vacuum extraction/air stripping of groundwater within the source area (historical hot spot with 1,1,2,2-PCA-contaminated soil concentrations greater than 1,000 micrograms per kilogram (µg/kg) and/or free-phase solvents), institutional controls (ICs), natural attenuation of groundwater outside of the hot spot, and LTM of groundwater was the selected remedy for CG039 in the ROD (U.S. Army, et al., 1997). An estimated 95 to 99 percent of the soil contamination has been removed from the source area during system operations, therefore reducing the source of groundwater contamination at the site (U.S. Army Directorate of Public Works [DPW], 2008). Groundwater monitoring of natural attenuation has continued over the last 14 years. The 2011 *Memorandum to the Site File for Long Term Monitoring at the Poleline Road Disposal Area, Operable Unit B* established a revised monitoring schedule that defines the monitoring well network and the sampling frequency of those wells (USAF, 2011c).

Historical groundwater data (Figures 15-1 and 15-2) suggest that the deep groundwater plume is well defined and stable (CH2M HILL, 2012a). As noted in the Third CERCLA Five-Year Review for JBER-Richardson (USAF, 2013b), the downgradient boundary of the shallow plume is not completely defined; the recommendations from the Five-Year Review are being addressed

in a separate work plan. While concentrations of VOCs are generally decreasing in both the shallow and deep aquifers (see Section 15.3), current concentrations of TCE, 1,1,2,2-PCA, cis-1,2- dichloroethene (cis-1,2-DCE), and vinyl chloride remain above cleanup goals based on federal MCLs for drinking water and the EPA risk-based concentration (RBC) for 1,1,2,2-PCA (see Figures 15-1 and 15-2). As discussed in Section 15.4, an in situ bioremediation treatability study was implemented at the site in 2013. The treatability study is ongoing, but the most current status is summarized in the CG039 – Poleline Road Disposal Area Treatability Study Report (USAF, 2015e).

15.3 2014 FIELD ACTIVITIES AND RESULTS

In September 2014, samples were collected from seven groundwater monitoring wells at CG039 and analyzed for VOCs and natural attenuation parameters (including chloride/sulfate, nitrate/nitrite, dissolved iron and manganese, methane, ethane, and ethene). Field forms are included in Appendix A. LUC inspections were also conducted; inspection forms are included in Appendix B. Analytical results are summarized in Table 15-1 and on Figures 15-1 and 15-2.

In the shallow aquifer, TCE, 1,1,2,2-PCA, cis-1,2-DCE, and vinyl chloride exceeded cleanup criteria in one or more wells. In the deep aquifer, only TCE exceeded its respective cleanup criteria during this sampling round in monitoring well AP-4344. Benzene, carbon tetrachloride, chloroform, PCE, trans-1,2-DCE, 1,1,2-trichloroethane (TCA), and 1,1-DCE were detected in groundwater but at concentrations below their respective cleanup levels. A Mann-Kendall trend analysis was performed for two wells (AP-3747 and AP-4353) located within the shallow aquifer plume and one well (AP-4344) downgradient of the deep aquifer plume. Statistically significant decreasing trends for TCE and 1,1,2,2-PCA were identified at AP-4353 (see Table 15-2 and Figures 15-3 and 15-4).

Although trend analysis has been performed for monitoring well AP-4550 for past events, trend analysis was not performed for AP-4550 in this report because it is within the target treatment area of the ongoing treatability study, and contaminant concentrations at that location have been drastically reduced. More detailed information on results specific to the treatability study can be found in CG039 – Poleline Road Disposal Area Treatability Study Report (USAF, 2015e).

Geochemical results (including laboratory and field measured parameters) were evaluated to assess natural attenuation processes at CG039. Laboratory measured parameters included: sulfate, nitrate/nitrite, dissolved iron and manganese, methane, ethane, and ethene. Field measured parameters (using a YSI 556) include pH, conductivity, turbidity, DO, temperature, and ORP. Laboratory and field measured natural attenuation parameter results are presented in Tables 15-3 and 15-4, respectively.

Natural attenuation parameter results indicate that conditions are favorable for reductive dechlorination processes in the shallow aquifer. Conditions are assessed by examining the parameter results within the contaminant plume in the shallow aquifer (AP-3983R and

AP-4550), and in some cases comparing those results to those from the shallow aquifer well (AP-3747) outside the plume .Supportive results include:

- Low ORP values indicative of reducing conditions
- High concentrations of methane (concentrations greater than 1,000 ug/L are indicative of highly reducing conditions and results within the hotspot four to five orders of magnitude greater than the result outside of the hot spot).
- Higher dissolved manganese concentrations within the hotspot than outside of the hotspot (over three orders of magnitude greater; increase in manganese concentrations can indicate conditions favorable for reductive dechlorination).
- Higher dissolved iron concentrations within the hotspot than outside of the hotspot (not detected outside the hotspot; increase in iron concentrations can indicate conditions favorable for reductive dechlorination).
- Depleted concentrations of sulfate within the hotspot in comparison with outside of the hot spot (indicate conditions are favorable for reductive dechlorination).

Additional natural attenuation data has been collected in association with the ongoing treatability study, and is presented and discussed in CG039 – Poleline Road Disposal Area Treatability Study Report (USAF, 2015e).

15.4 SITE SUMMARY AND RECOMMENDATIONS

The current ADEC site status for CG039 is "Active."

An Optimized Exit Strategy (OES) Performance Plan for CG039 was finalized in February 2013 under the current PBR contract. The OES at CG039 includes performing an enhanced reductive dechlorination treatability study and continuing long-term monitoring as outlined in the 2011 Memorandum to the Site File. Implementation of the treatability study occurred in 2013, when injection wells were installed and a combination of emulsified vegetable oil (EVO) and ferrous sulfate were injected into two locations in the shallow aquifer and one location in the deep aquifer. Monitoring of the treatability study is ongoing (USAF, 2015e) and indicates that strongly reducing conditions have been established and substantial reductions in TCE concentrations have been achieved in the target treatment areas (USAF, 2015e).

15.4.1 Five-Year Review

CG039 is required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. To date, three CERCLA five-year reviews, in 2003, 2008, and 2013, have been performed for JBER-Richardson (which includes CG039).

The Third CERCLA Five-Year Review Report for JBER-Richardson (USAF, 2013b) included the following recommendations for CG039:

- Augment the monitoring well network in the shallow aquifer to define the downgradient limit of the plume.
- Update the OUB COC RA-Os to provide future protectiveness of human health.

A work plan to install one monitoring well at CG039 has been developed to address the first recommendation (USAF, 2015f) and the Air Force is currently preparing an additional document to address the second recommendation.

15.4.2 Recommendations

Site CG039 has been identified as a **Yellow** priority because the treatability study has substantially reduced contaminant concentrations in the target treatment zones; however, there is uncertainty regarding the downgradient extent of TCE contamination in the shallow aquifer. Annual monitoring will continue to assess plume-wide and treatability target treatment zones concentration trends, as described below. A monitoring well will be installed in summer 2015 to address the uncertainty regarding the downgradient extent of the shallow TCE plume.

Specific recommendations for ongoing groundwater monitoring are as follows:

- Annual groundwater monitoring will continue in accordance with the 2011 *Memorandum to the Site File for OUB/Poleline Road Disposal Area* (Memo to Site File).
- For the treatability study, two years of annual groundwater monitoring (2015 and 2016) will be performed to assess potential rebound of TCE concentrations, degradation of TCE daughter products, and persistence of reducing groundwater conditions.
  - All requirements of the Memo to Site File will continue to be monitored, but analytical and field parameters will be added as necessary so that the treatability study wells (AP-3744, AP-3747, AP-3983R, AP-3989, AP-4550, and AP-4551) continue to be monitored as outlined in Table 18-1 of the *Final CG039 – Poleline Road Disposal Area Treatability Study Work Plan* (USAF, 2013c) (Work Plan). The annual sampling will be modified as follows:
    - Five wells will be sampled annually as prescribed by the Memo to Site File: AP-3748, AP-4344, AP-4353, AP-5246, and AP-5683 (AP-4019 replacement well).
    - Two wells identified for annual sampling in the Memo to Site File will still be sampled as prescribed, with the addition of the treatability study parameters listed in Table 18-1 of the Work Plan: AP-3747 and AP-4550.
    - Two wells identified as Sentinel Wells to be sampled in the year preceding the Five-Year Review (2017) will also be sampled in 2015 and 2016 for the treatability study parameters listed in Table 18-1 of the Work Plan: AP-3744 and AP-3989.
    - Three wells that are not identified to be sampled in the Memo to Site File, either annually or every 5 years, will be sampled in 2015 and 2016 for the

treatability study parameters listed in Table 18-1 of the Work Plan: AP-3983R, AP-4525, and AP-4551.

- The 2015 and 2016 annual groundwater monitoring work plans will formally outline this plan.

The monitoring results from the seven wells to be sampled for the treatability study parameters will be reported in a distinct section of future annual groundwater monitoring reports.

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Table 15-1 Summary of 2014 Analytical Results at CG039

Analyte	Cleanup Level	Shallow Aquifer			Deep Aquifer			
		AP-3747	AP-4353	AP-4550	AP-3748	AP-4344	AP-5246	[a] AP-5683
Acetone	33000[d]	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Benzene	5	ND(0.3)	ND(0.3)	0.29 J	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
Carbon tetrachloride	5	1.85	ND(0.3)	ND(0.3)	ND(0.3)	0.2 J	ND(0.3)	ND(0.3)
Chloroform	140[d]	2.11	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
cis-1,2-Dichloroethene (cis-1,2-DCE)	70	13.4	43.9	924	ND(0.3)	0.45 J	ND(0.3)	ND(0.3)
trans-1,2-Dichloroethene (trans-1,2-DCE)	100	3.17	12	31.8	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
1,2-Dichloroethane (1,2-DCA)	5[d]	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
PCE	5	1.96	3.02	0.52	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
TCE	5	**209**	**196**	**10.6**	ND(0.3)	16.6	ND(0.3)	ND(0.3)
Vinyl chloride	2[d]	ND(0.3)	ND(0.3)	**5.25**	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
1,1,2,2-Tetrachloroethane (1,1,2,2-PCA)	4.3[c]	**27.8**	**40.6**	**97.2 J**	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
1,1,2-Trichloroethane (1,1,2-TCA)	5[d]	1.57	1.32	3.39	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
1,1,1-TCA	200[d]	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
1,1-Dichloroethene (1,1-DCE)	7[d]	0.79	1.13	3.14	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)

[a] AP-5683 is a replacement well for AP-4019.

b MCL based cleanup level established in the Operable Units A and B ROD (U.S. Army, et al., 1997), unless otherwise noted.

c Risk based cleanup level established in the Operable Units A and B ROD (U.S. Army, et al., 1997)

d MCL, cleanup level not established in the Operable Units A and B ROD (U.S. Army, et al., 1997)

Table 15–1 Summary of 2014 Analytical Results at CG039 (Continued)

Notes:

All units are µg/L

Bold = result exceeded cleanup criteria

B = The analyte was detected in the associated method and/or calibration blank.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

MCL = United States Environmental Protection Agency Maximum Contaminant Level (unless otherwise noted)

Table 15-2 Summary of 2014 Mann-Kendall Concentration Trends for Select Wells at CG039

Well	Benzene	[a] Carbon Tetrachloride	[a] 1,1,2,2-PCA	[a] cis-1,2-DCE	[a] trans-1,2-DCE	[a] PCE	[a] TCE	Vinyl Chloride	1,1-DCE	1,1,2-TCA
Hot Spot – Shallow										
[b] AP-4353	NST	NST	Declining (100)	Declining (100)	Declining (99.9)	Declining (99.9)	Declining (98.1)	NST	Declining (99.8)	Declining (100)
Downgradient – Shallow										
AP-3747	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST
Downgradient – Deep										
AP-4344	NST	NST	NST	NST	NST	NST	NST	NST	NST	NST

Notes:

[a] Contaminants of Concern

[b] Well AP-4353 has never exceeded 1,000 micrograms per liter (the definition of the "hot spot"), but is considered with hot spot wells because it likely would have met the criteria if sampling had occurred at this location prior to the remedial actions.

Wells included in this table were sampled during the 2013 monitoring event and show at least one significant trend (according to Mann-Kendall analysis) for the included analytes. The remaining wells are either free of contamination, or do not have any significant trends.

Declining (96.2) = Declining concentration trend with 96.2 percent confidence.

NST = No significant trend.

Trends are considered significant at greater than 90 percent confidence.

1,1,2-TCA = 1,1,2-trichloroethane

1,1,2,2-PCA = 1,1,2,2-tetrachloroethane

cis-1,2-DCE = cis-1,2-dichloroethene

trans-1,2-DCE = trans-1,2-dichloroethene

PCE = tetrachloroethene

TCE = trichloroethene

Table 15-3 Summary of 2014 Field Measured Natural Attenuation Parameters at CG039

Monitoring Well ID	Date	Time	Water Level (ft bgs)	Volume Purged (gallons)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (^{o}C)	ORP (mV)
Shallow Wells Inside Hot Spot										
AP-4353	9/5/2014	1540	33.11	2.2	6.76	0.258	0.61	1.5	5.95	-37.2
AP-4550	9/9/2014	1450	22.65	3.0	6.76	0.370	49	0.90	6.00	-96.2
Shallow Wells Outside Hot Spot										
AP-3747	9/9/2014	1030	24.91	2	7.08	0.318	6.4	6.9	4.63	6.4
Deep Wells Outside Hot Spot										
AP-3748	9/5/2014	1250	130.68	1.5	7.65	0.396	14	1.4	2.19	230
AP-4344	9/5/2014	1100	146.86	3.3	7.94	0.225	16	NM*	5.33	238
AP-5246	9/4/2014	1425	147.24	1.5	7.57	0.328	0.95	4.9	5.34	207
AP-5683	9/4/2014	1620	134.5	2.2	7.96	0.205	1.7	3.5	5.33	201

Notes:

*DO probe malfunctioning. Value out of range (see field notes in Appendix A)

NM = not measured

Table 15-4 Summary of 2014 Laboratory Measured Natural Attenuation Parameter at CG039

Monitoring Well ID	Total Nitrate/Nitrite (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)
Shallow Wells Inside Hot Spot								
AP-4353	0.0844	12.6	0.97	0.922	1.34	0.541	0.38J	839
AP-4550	0.156	25.6	0.983	ND(0.1)	1.73	0.44J	0.303J	5860
Shallow Wells Outside Hot Spot								
AP-3747	0.334	ND(0.02)	0.000529	11.4	2.52	ND(0.11)	ND(0.119)	0.0961B
Deep Wells Outside Hot Spot								
AP-3748	0.913	0.0366J	0.0114	18.7	89.5	ND(0.108)	ND(0.117)	0.0662B
AP-4344	0.401	ND(0.02)	ND(0.002)	12.1	19.7	ND(0.111)	ND(0.12)	0.356B
AP-5246	1.07	ND(0.02)	0.00112B	20.4	51.7	ND(0.161)	ND(0.167)	0.0607B
AP-5683	0.384	ND(0.02)	0.00067B	11.3	15.9	ND(0.232)	ND(0.232)	0.0915B

Notes:

J = Analyte was present but the reported value may not be precise or accurate (estimated).
B = The analyte was detected in the associated method and/or calibration blank.

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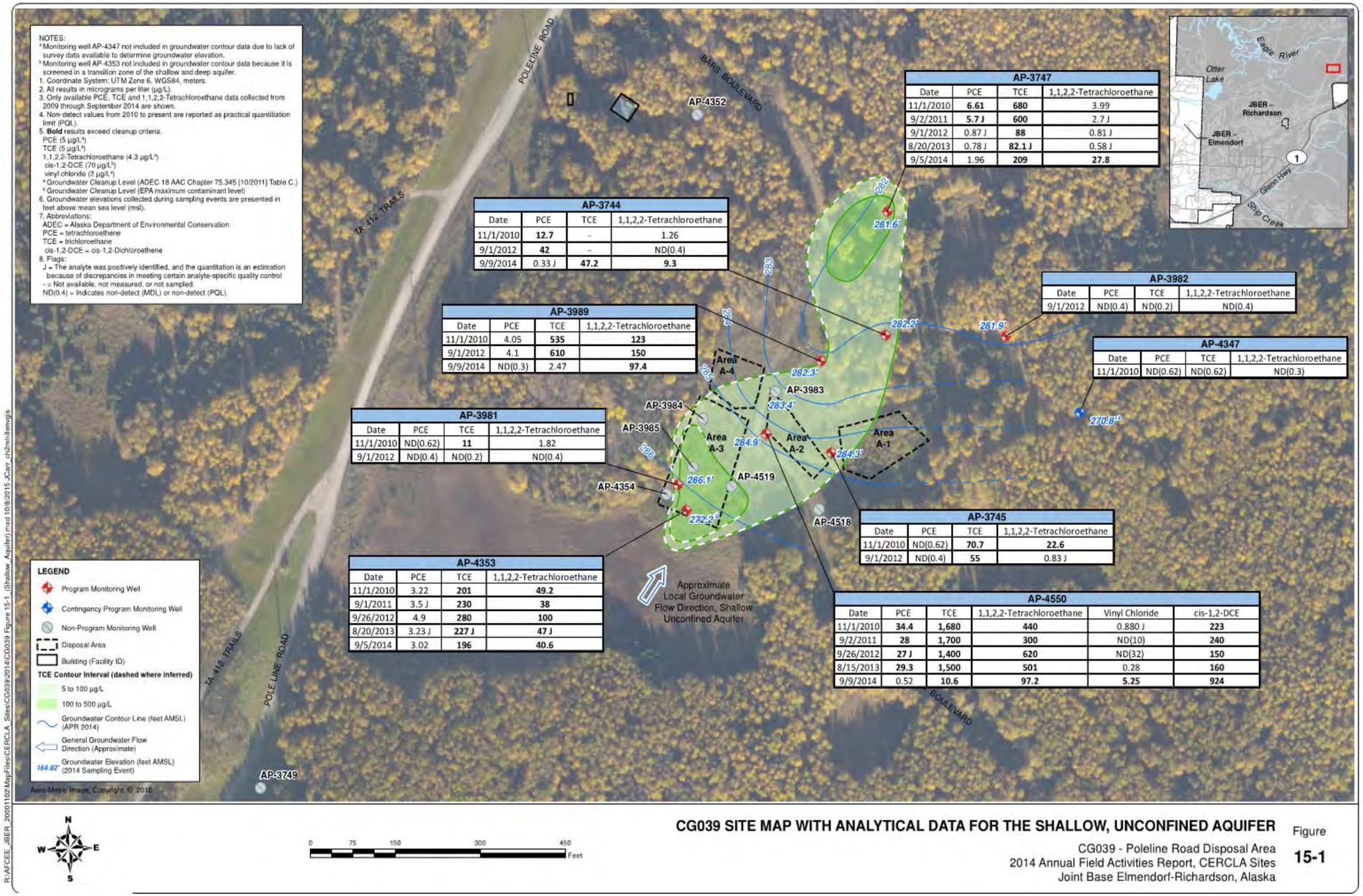
Figure 15-1 CG039 Site Map with Analytical Data For The Shallow, Unconfined Aquifer



CG039 SITE MAP WITH ANALYTICAL DATA FOR THE SHALLOW, UNCONFINED AQUIFER

CG039 - Poleline Road Disposal Area
2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Figure **15-1**

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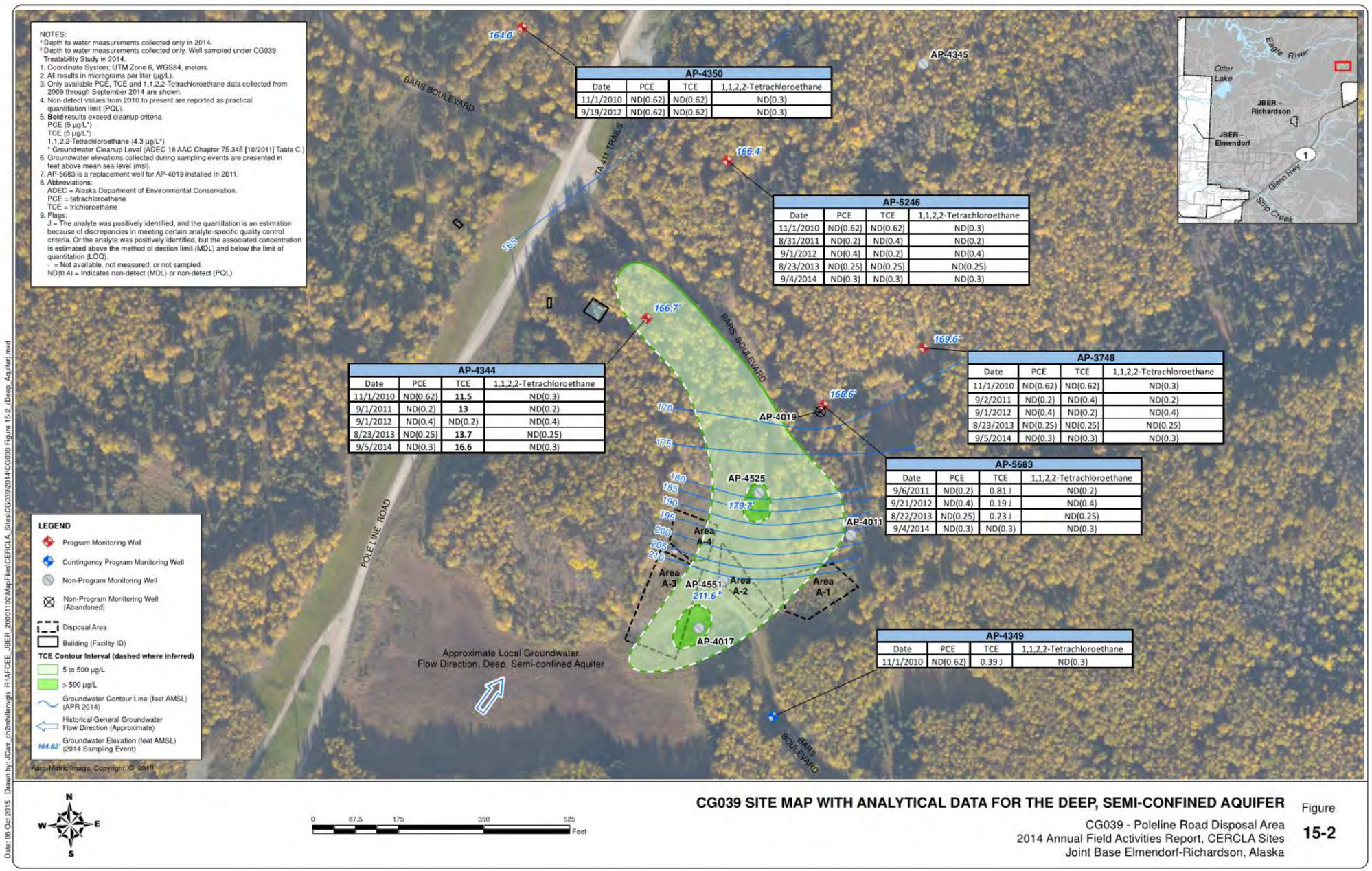
Figure 15-2 CG039 Site Map With Analytical Data For The Deep, Semi-Confined Aquifer



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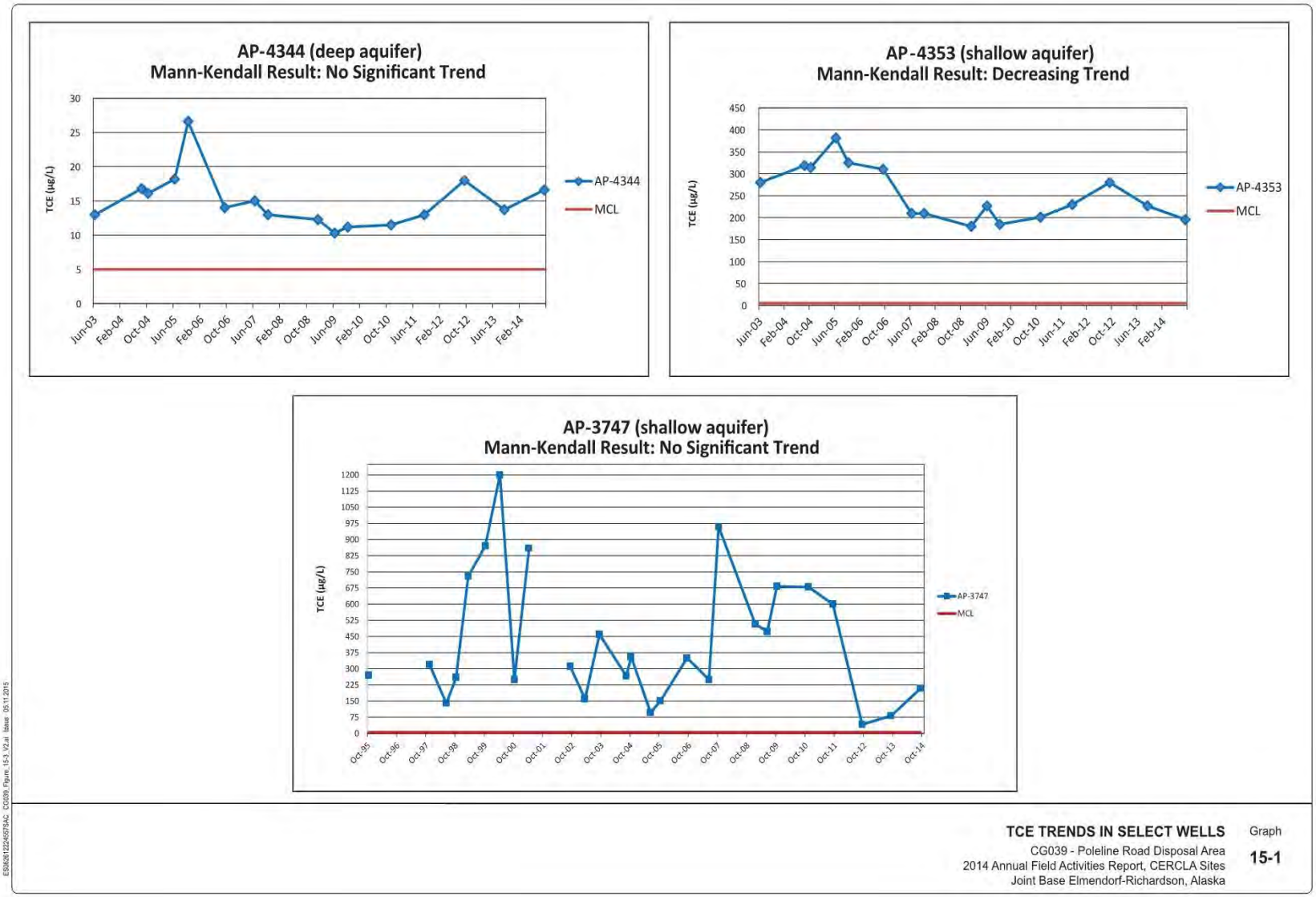
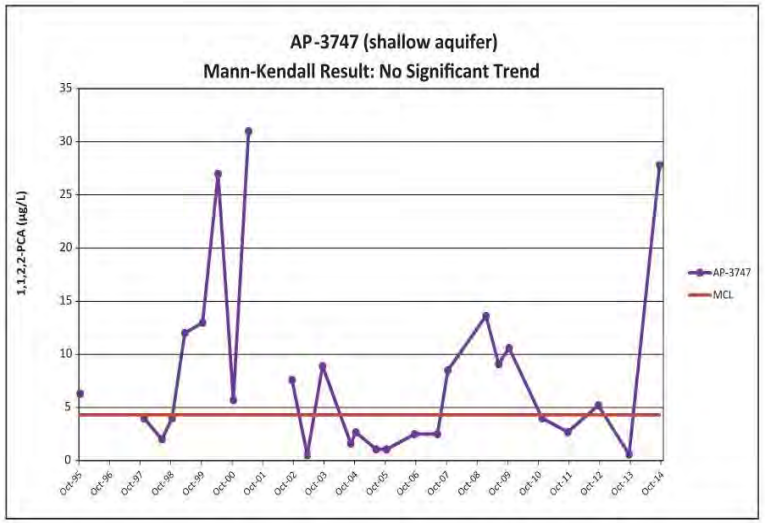
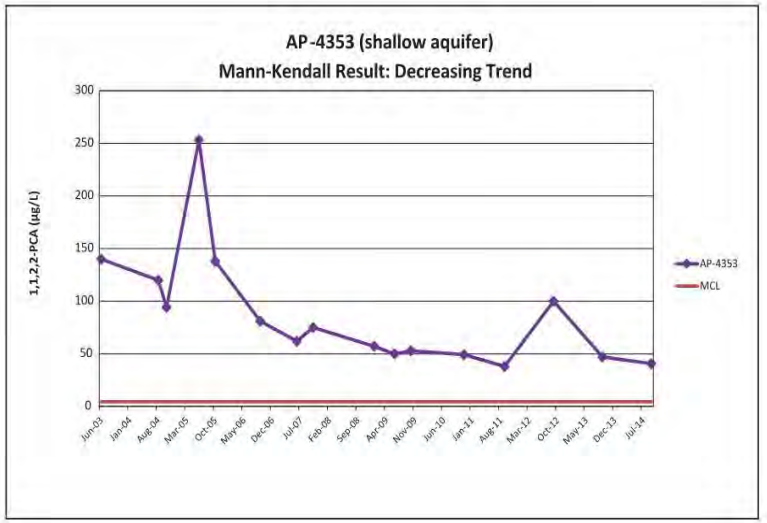
Graph 15-1 CG039 TCE Trends in Select Wells



Graph 15-2 CG039 1,1,2,2 PCA Trends in Select Wells





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1,1,2,2-PCA TRENDS IN SELECT WELLS
CG039 - Poleline Road Disposal Area
2014 Annual Field Activities Report, CERCLA Sites
Joint Base Elmendorf-Richardson, Alaska

Graph
15-2

16.0 DA089 [ARMORED VEHICLE MAINTENANCE AREA]

PBC Performance Objective: Design and Implement Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2019

16.1 SITE DESCRIPTION

DA089 (formerly DA085-FTRS-85) – Armored Vehicle Maintenance Area (AVMA) is located southeast of the intersection of Otter Lake Road and D Street (Figure 1-1). DA089 consists of a PCE groundwater plume that was investigated as a part of the OUE RI in 2004 (CH2MHILL, 2005). The dissolved-phase PCE contamination in groundwater originated in the area immediately downgradient from Building 726. Dry cleaning solvents (PCE and/or Stoddard solvent) were stored in USTs at the site, and tank bottoms were disposed of in a dumpster at the site. Low levels of PCE contamination were detected in soils at the Building 726 site, indicating that PCE had been used at the facility (U.S. Army DPW, 2008). For additional site information, including previous investigations, see the *Environmental Restoration Program 2011 Groundwater Monitoring and Borehole Sampling, Three-Party Agreement Sites: OUB Poleline Road Disposal Area and OUE Armored Vehicle Maintenance Area* (USAF, 2012b).

16.1.1 Site Geology

DA089 lies on an alluvial plain, often referred to as the Anchorage Lowland. The underlying geology at DA089 is complex and highly variable. The Mountain View Fan is approximately 40 to 60 feet thick under most of the site and consists of mostly sands and gravels with localized deposits of silt and clay. The Elmendorf Moraine can be found approximately 0.5 mile north of the site.

16.1.2 Site Hydrology

There are no wetlands or surface water features located on the site. The nearest surface water is Ship Creek, located crossgradient of DA089 approximately 1 mile to the southwest.

16.1.3 Site Hydrogeology

Groundwater directly underlying the site is encountered in both a shallow perched aquifer and a deeper confined aquifer separated by a low-permeability silt layer. The thickness of the silt layer varies across the site and pinches out toward the northern edge of the site. The perching layer was found to extend north to the Davis Highway, northwest of Building 732.

In areas where the silt layer is present, a shallow perched aquifer is encountered at approximately 60 feet bgs, and a deeper confined aquifer is present below the silt layer at approximately 100 feet bgs. The aquifers merge where the silt layer pinches out, just north of Davis Highway, forming a thick unconfined aquifer. Groundwater flow is toward the northwest in all components of the aquifer system at the site.

16.2 REGULATORY REQUIREMENTS

The only COC in groundwater identified in the OUE ROD was PCE. No COCs were identified for soil. Although previous RIs conducted at the site did not identify a source for the PCE in groundwater, anecdotal evidence suggests that a localized source must have existed near the northwestern side of Building 726 as a result of vehicle maintenance and laundry operations conducted at Buildings 732 and 726, respectively (U.S. Army DPW, 2008). The PCE plume extends approximately 600 feet northwest from this apparent Building 726 source.

The selected remedy in the OUE ROD consists of ICs for groundwater use, natural attenuation of PCE in groundwater, and long-term groundwater monitoring (U.S. Army DPW, 2005). Long-term groundwater monitoring began in 2004 (U.S. Army DPW, 2008). Current monitoring requirements include annual groundwater sampling at ten wells: six wells within the plume, three downgradient wells, and one crossgradient well.

As stated in the OUE ROD, if the monitoring results for any two consecutive sampling events indicate that contaminant concentrations are increasing, then EPA, ADEC, and the Air Force will reevaluate the remedy. As such, statistical analyses are performed following each annual monitoring round to assess concentration trends across the site (see Section 16.3).

The boundaries of the plume do not appear to be expanding, and no statistically significant increasing trends in the PCE concentrations are apparent from the historical monitoring data, indicating that the plume is stable (see Section 16.3 and CH2MHILL, 2012). Dilution appears to be the primary mechanism for natural attenuation at the site (CH2MHILL, 2012a) because aerobic groundwater, the stability of natural attenuation geochemical parameters (Appendix A2), and the lack of PCE daughter products suggest that biodegradation plays a limited role in PCE attenuation.

16.3 2014 FIELD ACTIVITIES AND RESULTS

In September 2014, samples were collected from ten groundwater monitoring wells at DA089 and analyzed for VOCs and natural attenuation parameters (including chloride/sulfate, nitrate/nitrite, dissolved iron and manganese, methane, ethane, and ethene). LUC inspections were also conducted; inspection forms are included in Appendix B. Field forms are included in Appendix A.

As shown in Table 16-1 and Figure 16-1, PCE was detected above the maximum contaminant level (MCL) in five of the ten monitoring wells sampled. No other compounds were detected above the associated cleanup level. Figure 16-2 presents a graphical representation of PCE concentration trends since 2002. A Mann-Kendall statistical analysis with a confidence interval of 90 percent or above was performed to identify any PCE concentration trends at the site. A statistically significant decreasing trend was identified at AP-4413, which is within the target treatment zone of the treatability study being conducted at DA089 (USAF, 2014f). No other

wells show a statistically significant trend in the PCE-affected area (see Figure 16-2 and Table 16-2).

Geochemical results (including laboratory and field measured parameters) were evaluated to assess natural attenuation processes at DA089. Laboratory measured parameters include chloride/sulfate, nitrate/nitrite, dissolved iron and manganese, methane, ethane, and ethene. Field-measured parameters (using an YSI 556) include pH, conductivity, turbidity, DO, temperature, and ORP. Laboratory and field-measured natural attenuation parameter results are presented in Tables 16-3 and 16-4, respectively.

Natural attenuation parameter results indicate that conditions are favorable for reductive dechlorination processes near AP-4413, where EVO has been injected at DA089. Conditions are assessed by examining the parameter results at AP-4413, and in some cases comparing those results to those from other wells .Supportive results include:

- Low ORP result indicative of reducing conditions at AP-4413.
- A higher concentration of methane in the sample from AP-4413 than from other sampled DA089 wells (although not indicative of highly reducing conditions, which is generally indicated by greater than 1,000 ug/L methane; the concentration at AP-4413 is two orders of magnitude greater than results from most other DA089 wells).
- A higher dissolved manganese concentration in the sample from AP-4413 (four orders of magnitude greater than results from other sampled DA089 wells, with one exception); an increase in manganese concentrations can indicate conditions favorable for reductive dechlorination).
- A higher dissolved iron concentration in the sample from AP-4413 than other DA089 wells (not detected in all but one other well; an increase in iron concentrations can indicate conditions favorable for reductive dechlorination).
- Depleted concentrations of sulfate in the sample from AP-4413 (one order of magnitude less) in comparison with other DA089 wells (indicate conditions are favorable for reductive dechlorination).

16.4 SITE SUMMARY AND RECOMMENDATIONS

The current ADEC site status for DA089 is “Active.”

An OES Performance Plan for DA089 was finalized in February 2013 under the current PBR contract. The OES at DA089 includes performing an in situ bioremediation treatability study and continuing long-term monitoring as outlined in the OUE ROD. Implementation of the treatability study began in 2013, when injection wells were installed and an EVO substrate was injected into the shallow perched aquifer near AP-4413. Following the initial EVO injection (September 2013), three quarters of groundwater monitoring followed. Results showed that, although

geochemically reducing conditions were evolving, PCE concentrations were not decreasing. Therefore, contingency decisions were made prior to analyzing the final round of quarterly performance monitoring data in an effort to implement the contingency action during the 2014 field season (USAF, 2014f).

The contingency action included conducting another round of EVO injections and adjusting the design parameters as follows:

- The EVO volume was tripled to increase the mass of carbon in the aquifer.
- The total injection volume was tripled to improve distribution.
- The mass of lactate injected into the aquifer was tripled to accelerate the evolution of anaerobic conditions.
- The EVO substrate was changed to 100 percent Terra Systems SRS-FR (5-micrometer [µm] droplet size) which has larger droplets to help retain more EVO near the injection zone.

This second round of EVO injections was completed on October 15, 2014. The first quarterly groundwater sampling of monitoring well AP-4413 to further evaluate the performance was conducted on March 17, 2015, and monitoring is currently ongoing.

16.4.1 Five-Year Review

DA089 is required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. To date, three CERCLA five-year reviews have been performed for JBER-Richardson (which includes DA089), in 2003, 2008, and 2013.

The third five-year report conducted in 2013 recommended that the potential vapor intrusion pathway be assessed for the site. Additionally, because natural attenuation had been shown to be limited at DA089, and in an effort to meet the 30-year time frame stated in the OUE ROD, a pilot study of an enhanced natural attenuation technology (Anaerobic Biodegradation using EVO) was recommended (USAF, 2013b).

The first recommendation is being addressed by a forthcoming vapor intrusion investigation. The ongoing treatability study satisfies the second recommendation.

16.4.2 Recommendations

Site DA089 has been identified as a **Yellow** priority because there are no significant decreasing PCE trends outside of the well within the target treatment zone of the treatability study.

Based on the results of this annual field activities report and the treatability study implementation report (USAF, 2014f), the following actions are recommended:

- Based on more than 10 years of PCE concentrations below the MCL at wells AP-3870 and AP-3893, cease groundwater sampling and analysis at those wells, but continue to collect water level measurements during annual monitoring events.
- Continue annual groundwater monitoring at the remaining wells within the monitoring program.

Continue quarterly groundwater monitoring of AP-4413 through the end of 2015, at which time the effectiveness of the Treatability Study will be reevaluated and results will be presented in a Treatability Study Report.

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Table 16-1 Summary of 2014 Analytical Results at DA089

Analyte	Cleanup Level [a]	AP-3468	AP-3534	AP-3774	AP-3870	AP-3871	AP-3893	AP-4341	AP-4342	AP-4411	AP-4413
DRO	1,500[b]	--	--	--	--	--	--	23.5J	--	--	--
GRO	2,200 [b]	--	--	--	--	--	--	52.1B	--	--	--
Acetone	33,000 [c]	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	17.9
Carbon tetrachloride	5 [c]*	ND(0.3)	ND(0.3)	0.45J	0.19J	0.13J	ND(0.3)	0.57	0.74	ND(0.3)	ND(0.3)
Chloroform	140 [c]	0.5	0.25J	0.33J	0.26J	2.78	ND(0.3)	0.87	0.89	ND(0.3	0.79
PCE	5*	**32.3**	**32.5**	0.39J	ND(0.3)	ND(0.3)	ND(0.3)	**21.2**	**51.9**	**9.53**	**52.8**

a Cleanup level established in the OUE ROD, unless otherwise noted

b 18 AAC 75 Table C Groundwater Cleanup Level

c United States Environmental Protection Agency Maximum Contaminant Level; Federal Safe Drinking Water Act (Title 40, Parts 141 and 143, of the Code of Federal Regulations [CFR])

Notes:

All units are µg/L
Bold = Result exceeded cleanup criteria
B = The analyte was detected in the associated method and/or calibration blank
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
-- = not analyzed

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Table 16-2 Summary of 2014 Mann-Kendall Statistical Analysis at DA089

Monitoring Well	Total Well Depth (feet)	PCE Concentrations - No Qualifiers* (µg/L)																		PCE Standard Deviation (µg/L)	PCE Range (µg/L)	PCE Average (µg/L)	Mann-Kendall Result
		Aug-02	Nov-02	Jun-03	Sep-03	Aug-04	Oct-04	May-05	Oct-05	Sep-06	Jun-07	Oct-07	Dec-08	May-09	Sep-09	Nov-10	Aug-11	Sep-12	Aug-13	Sep-14				
AP-3468	114.7	30.0	NS	69.0	NS	60.0	53.3	93.6	59.4	72	47	61	63	53.4	64.7	54.3	55	58	44.7	32.3	14.7	30 to 93.6	57.1	86.7% (-)
AP-3534	138.4	21	NS	28	19	25.4	24.1	81.5	59.1	43	18	18	23	24.5	21.9	23.1	22	40	37.4	32.5	16.5	18 to 81.5	31.2	63.3% (+)
AP-4341	68.1	1.8	NS	23	NS	12.7	14.6	20.8	19.0	13	12.0	9.3	1	27.9	16.2	7.67	18	8.9	19.8	21.2	7.45	<1 to 27.9	14.5	58.2% (+)
AP-4342	100.85	38.0	49.0	NS	53.0	41.1	62.5	61.3	55.9	66	52.0	52	62.9	55.8	58.0	52.1	51	51	54.9	51.9	7.09	38.0 to 66	53.8	53.0% (+)
AP-4411	72.8	NS	NS	9.8	8.9	11.2	20.4	23.9	24.6	11	10	12	6.64	7.94	15.6	10.5	16	6.8	3.33	9.53	5.99	3.33 to 24.6	12.2	88.4% (-)
AP-4413	75.4	NS	NS	100	120	175	171	120	143	190	150	120	120	113	121	88.8	140	88	78.8	52.8	36.1	78.8 to 190	123	99.1% (-)

Notes:

* Qualifiers have been removed to perform Mann-Kendall analysis

Data prior to August 2004 and September 2006 to present collected by CH2M HILL; data from 2004 through 2005 collected by Satori Group Inc.

Mann-Kendall results are considered statistically significant when results are 90% or greater:

- indicates decreasing trend

+ indicates increasing trend

96.8% (-) = Mann-Kendall analysis indicates with 96.8% confidence that the data have a decreasing trend

NS = not sampled

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Table 16-3 Summary of 2014 Field Measured Natural Attenuation Parameters at DA089

Monitoring Well ID	Date	Time	Water Level (ft bgs)	Volume Purged (gallons)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (°C)	ORP (mV)
Shallow/Perched Wells Within PCE Plume										
AP-3468	9/11/2014	1455	106.6	1.8	7.51	5.22	11.6	7	8.6	200
AP-3534	9/11/2014	1620	106.21	1.5	7.75	3.79	19.5	5.08	8	182
AP-4341	9/12/2014	1605	68.31	2.5	7.67	4.46	37.5	5.77	9.8	178
AP-4342	9/15/2014	1125	97.25	1.6	7.6	0.403	6.77	8.28	7.8	143
AP-4411	9/12/2014	1205	68.9	1	7.92	3.91	231	8.82	10.4	168
AP-4413	9/15/2014	1255	71.94	1.7	7.31	0.623	9.77	4.56	7.1	-53.2
Crossgradient (Background) Well Outside PCE Plume										
AP-3893	9/11/2014	1010	84.79	1.2	8.43	2.56	2.47	0.3	8.1	-67.6
Downgradient Wells										
AP-3774	9/11/2014	1135	103.18	1.5	7.3	520.9	8.06	6.53	6.5	165
AP-3870	9/8/2014	1430	95.96	3	7.12	0.504	63.7	6.24	7.55	2.6
AP-3871	9/8/2014	1555	106.97	2	7.36	0.557	16	6.06	6.78	-5.7

Notes:

°C = degrees Celsius
ft bgs = feet below ground surface
mg/L = milligrams per liter
mS/cm = milli-Siemens/cm
mV = millivolts
NTU = nephelometric turbidity units

Table 16-4 Summary of 2014 Laboratory Measured Natural Attenuation Parameters at DA089

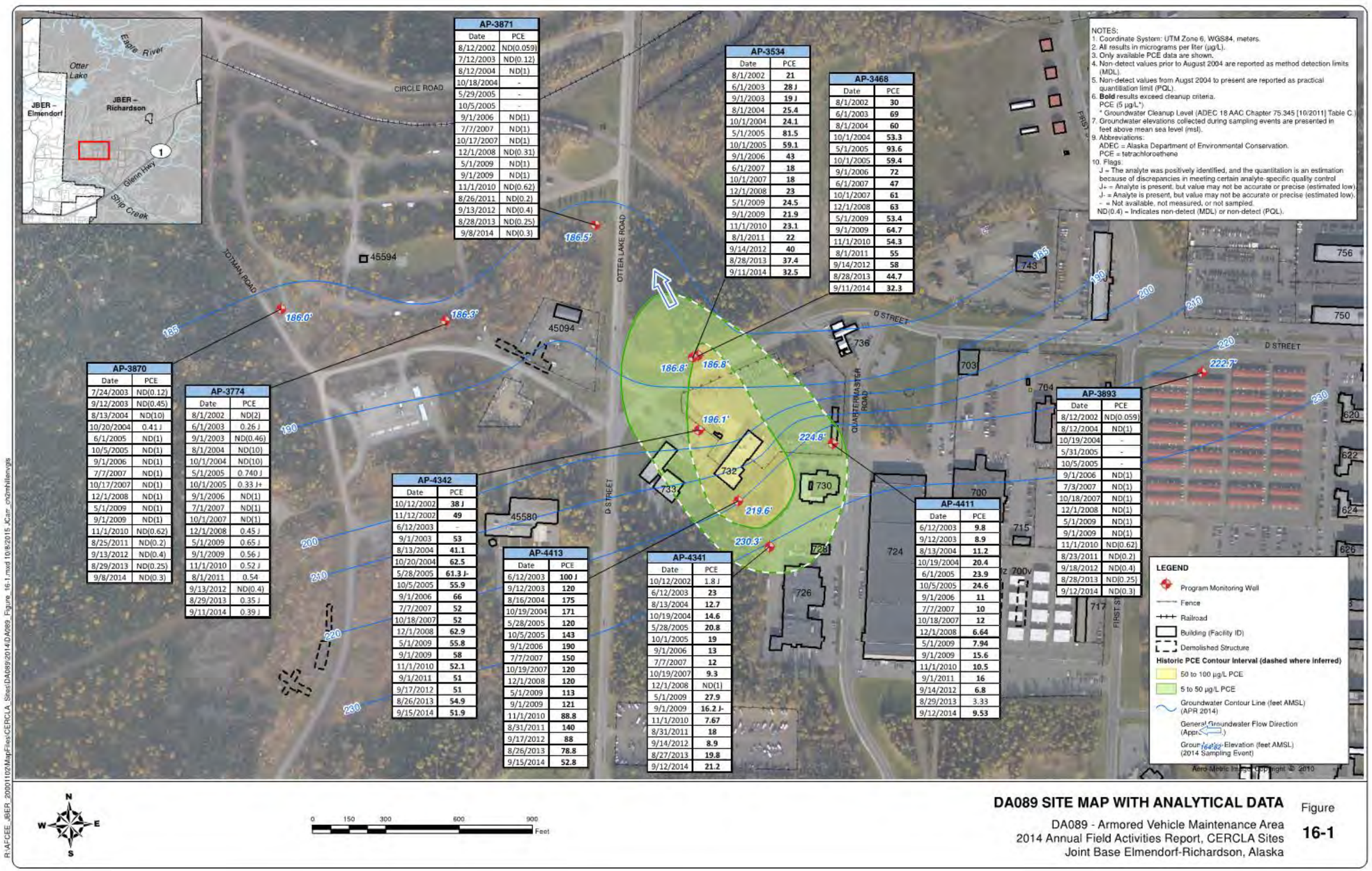
Monitoring Well ID	Total Nitrate/Nitrite (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)	Sulfate (mg/L)	Ethane (µg/L)	Ethene (µg/L)	Methane (µg/L)
Shallow/Perched Wells Within PCE Plume							
AP-3468	2.6	ND(0.02)	0.00311B	25.1	ND(0.108)	ND(0.117)	0.54B
AP-3534	1.54	ND(0.02)	ND(0.002)	23.6	ND(0.107)	ND(0.116)	0.0599B
AP-4341	1.86	ND(0.02)	0.00134B	17	ND(0.107)	ND(0.116)	0.0425B
AP-4342	2.32	ND(0.02)	ND(0.002)	17.3	0.0756J	0.179J	76.6
AP-4411	1.91	ND(0.02)	0.00122B	12.4	ND(0.11)	ND(0.119)	0.122B
AP-4413	0.386B	4.27	10.1	2.72	0.0812J	0.188J	78.4
Crossgradient (Background) Well Outside PCE Plume							
AP-3893	ND(0.006)	0.0539J	0.0465	18.7	ND(0.112)	ND(0.121)	0.229B
Downgradient Wells							
AP-3774	1.79	ND(0.02)	0.00082B	22.3	ND(0.111)	ND(0.12)	0.111B
AP-3870	1.74	ND(0.02)	ND(0.002)	24.3	ND(0.109)	ND(0.118)	3.5
AP-3871	1.59	ND(0.02)	ND(0.002)	24.9	ND(0.0873)	ND(0.0978)	0.117B

Notes:

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

B = The analyte was detected in the associated method and/or calibration blank

Figure 16-1 DA089 Site Map with Analytical Data



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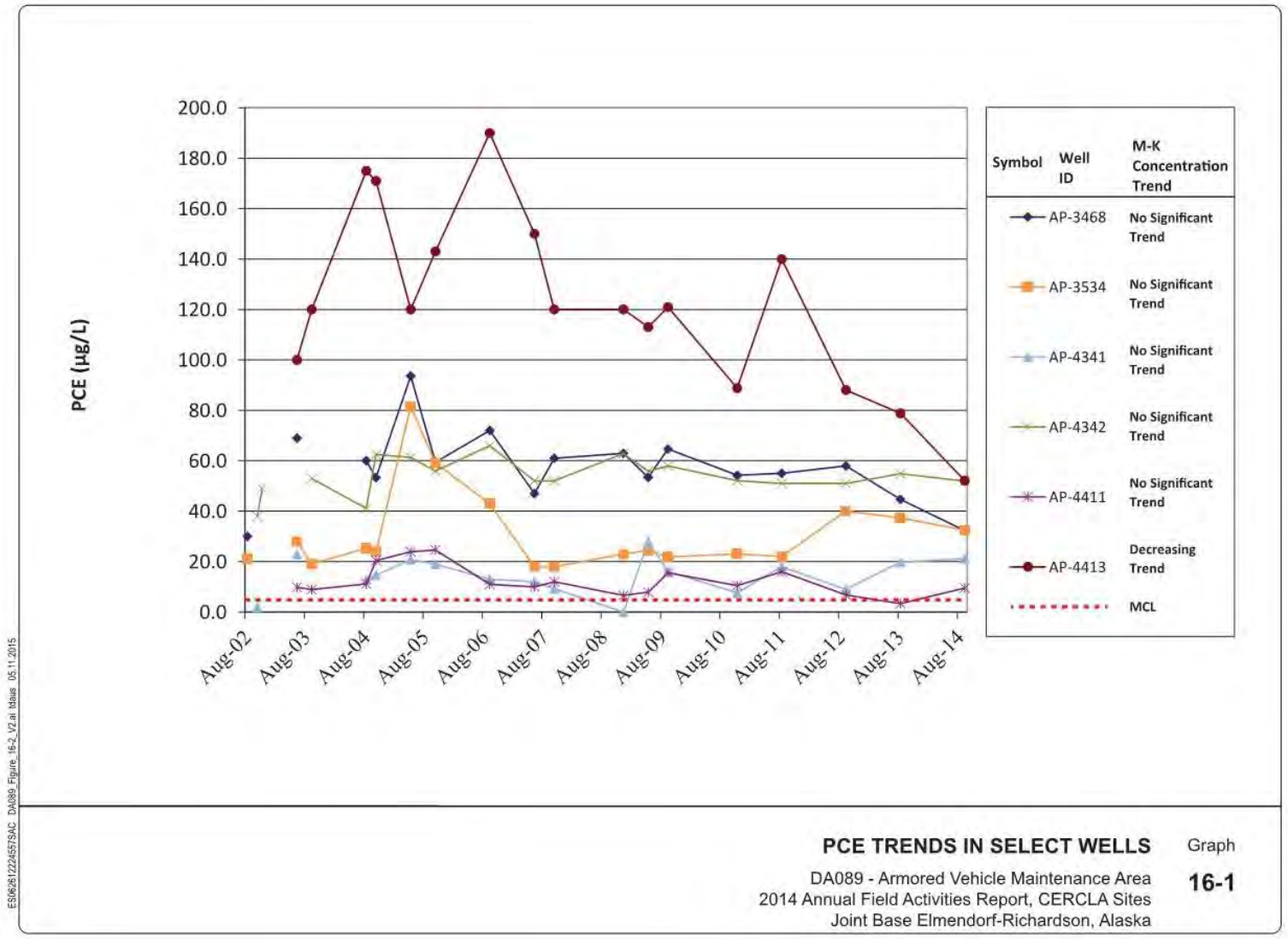
Graph 16-1 DA089 PCE Trends in Select Wells



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17.0 SS013 (MP BARRACKS PCB SITE)

PBC Performance Objectives: Response Complete

Response Complete Achievement Date: 2014

17.1 SITE DESCRIPTION

Site SS013 is located east of Sixth Street between the Davis Highway and D Street on JBER-R (Figure 1-1). The site historically consisted of various buildings, primarily Quonset huts, between 1950 and 1977. Between 1977 and the early 1990s, only a single building occupied the site. The specific use of the historical buildings is not known (U.S. Army, 2009). SS013 was vacant between the early 1990s and the construction of the current MP Barracks (properly known as "Enlisted Unaccompanied Personnel Housing") in 2010. The MP Barracks building occupies a portion of the site, and the building houses unaccompanied soldiers with an average residence time of 2 years. A lawn area, mailbox shelter, and concrete sidewalks are also located onsite.

17.1.1 Geology and Hydrology

Soils associated with SS013 consist of glacial outwash and unconsolidated, glacial till. The poorly sorted glacial till contains boulders, gravel, sand, and silt that are both horizontally and vertically discontinuous. Groundwater beneath SS013 is approximately 70 to 90 feet bgs and is not used for household, recreational, or industrial uses at the site. The nearest surface water to SS013 is Ship Creek, which is approximately 1.3 miles southwest of the site. Ship Creek serves as the main source of drinking water for JBER; the drinking water intake is over 3 miles upstream (upgradient) of the location where Ship Creek is closest to the site.

17.2 REGULATORY REQUIREMENTS

PCBs were identified as COCs in soil at SS013 during construction of the MP Barracks. PCBs in soil were addressed by Time Critical Removal Actions (TCRAs) performed in 2009 and 2010, and PCB-contaminated soils were removed from the site or capped with clean fill. Although PCBs remain in soil at concentrations between 1 and 10 mg/kg (concentrations are above 10 mg/kg beneath a cap in the lawn subarea), PCBs do not present a risk to current or reasonably anticipated future users of the site (adult-only residential scenario), and are covered with a minimum of 5 feet of clean soil. As documented in the Memo to Site File (USAF, 2014c), the USAF has determined that No Remedial Action for PCBs in soil is necessary. Land use restrictions—preliminary interim LUCs—and a cap implemented as a part of the TCRAs will continue to limit the use and/or exposure to soil at the site. LUCs and the cap will remain in place until site conditions are suitable for unlimited use/unrestricted exposure (UU/UE) (USAF, 2014c). The final remedy for SS013 will be selected in a Record of Decision (ROD). Additional characterization at SS013, including volatile organic compounds in soil beneath and indoor air concentrations inside the MP Barracks building, is necessary to further define the nature and extent of contaminants and to assess whether further action is necessary under CERCLA.

17.3 2014 FIELD ACTIVITIES

An LUC inspection was performed at SS013 on November 5, 2014. No issues were identified during the inspection. A copy of the 2014 LUC inspection form is provided in Appendix B.

17.4 SITE SUMMARY AND RECOMMENDATIONS

No deficiencies were observed during the LUC inspection in 2014. LUC inspections will continue to be conducted annually in accordance with the *Memorandum to Site File for SS013 PCB Time Critical Removal Action, Remaining PCB Contamination, and Required Interim Land Use Controls* (USAF, 2014c).

17.4.1 Five-Year Review

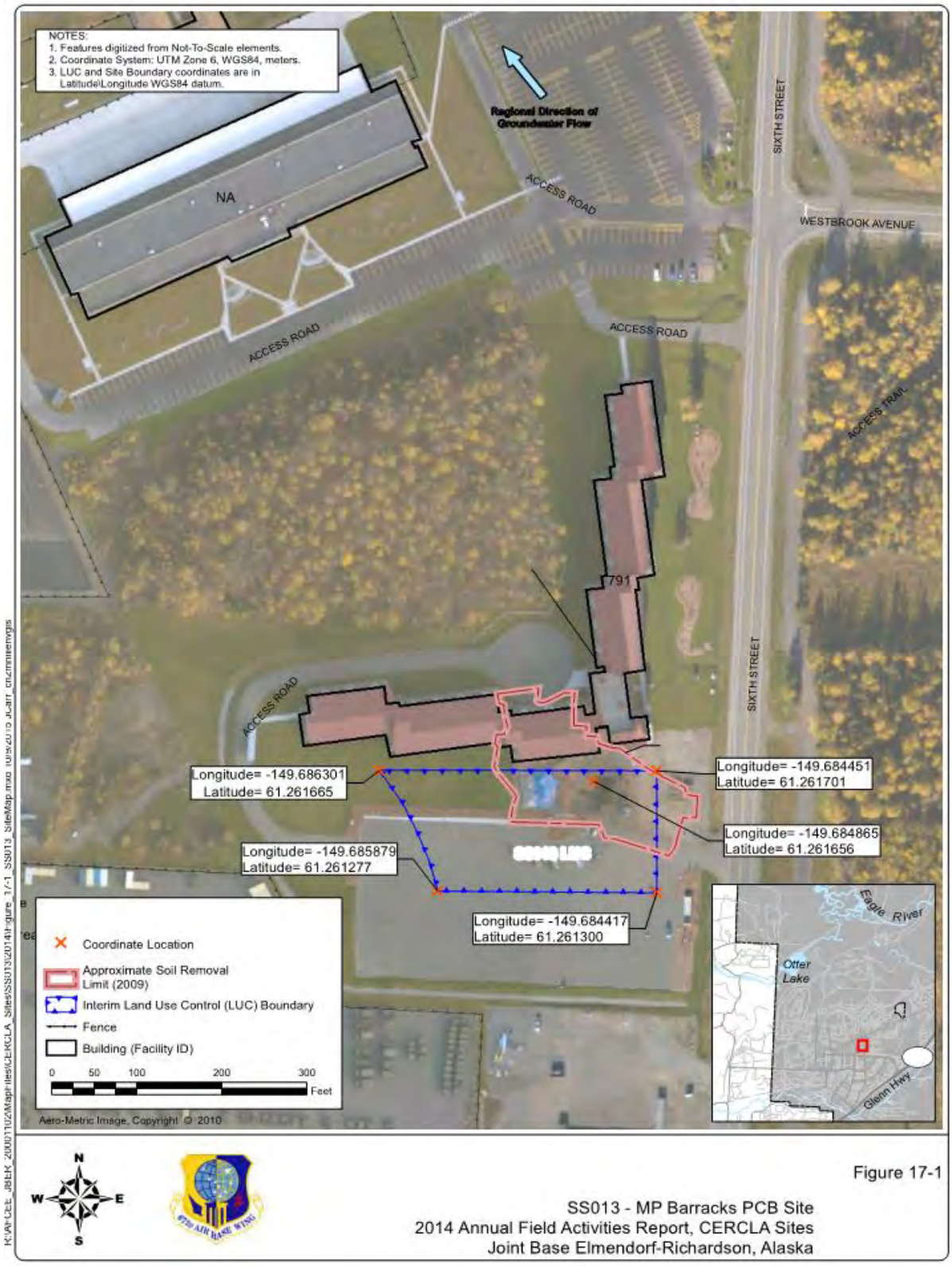
SS013 was not included in the 2013 five-year review because it had not met RC at that time. RC was achieved for the site in 2014, when the *Memorandum to Site File for SS013 PCB Time Critical Removal Action, Remaining PCB Contamination, and Required Interim Land Use Controls* (USAF, 2014c) was finalized and established preliminary interim LUCs.

17.4.2 Recommendations

Site SS013 is identified as a **Green** priority. and the following actions are recommended:

- Continuation of LUC inspections
- Additional characterization, including volatile organic compounds in soil beneath and indoor air concentrations inside the MP Barracks building, to further define the nature and extent of contaminants and to assess whether further action is necessary under CERCLA.

Figure 17-1 SS013 Site Map with Analytical Data



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18.0 SS044 (BUILDING 35-752 PCB SITE)

PBC Performance Objectives: Design and Implement Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2019

18.1 SITE DESCRIPTION

Site SS044, part of OU E at JBER-R, is located approximately one-third mile south of the Davis Highway, in a relatively undeveloped part of JBER-R (see Figure 1-1). Groundwater and soil contamination resulted from the historic activities associated with the operation and maintenance of USTs and electrical power generation equipment (generators and transformers) used from 1953 to 1987. The generators were housed inside Building 35-752, and were used to power a high-frequency transmitter array and control center located in the adjacent Building 35-750. Fuel for the generators was stored in seven 5,000-gallon USTs. Cooling ponds stored water to cool the generators. Four large transformers (750 kilovolt) were located at the site during operation of the power generation facility. The transformers were located on the northeastern side of Building 35-750. Sometime around 1982, these transformers were replaced and removed from the site (DPW, 2008). The generators were removed in 1987, and the building was used for general storage for several years afterward. In 1990, the seven 5,000-gallon USTs were excavated and removed from the southern side of Building 35-752. The building was boarded up and secured with a locked fence in 1995.

SS044 was initially investigated as part of an RI conducted from 1996 to 1998 for Operable Unit D (OUD) (ENSR, 1998). The primary source areas at the site include a transformer mounting pad, a pit where waste oil was burned, a peripheral road where contaminated soil was used as a base, and a stockpile area for PCB-contaminated soil.

In 1997, approximately 1,500 cubic yards of soil were excavated from the site during construction of a parking lot and roadway (USACE, 2005). The soil was determined to be contaminated with PCBs, and was stockpiled at the site until being transported to a Toxic Substances Control Act (TSCA)-regulated landfill in 2001.

While the OUD ROD (ENSR, 2000) was being developed, new information indicated that PCB-containing transformer oil may have been burned at the site. Additional potential hazardous source areas were identified at the site related to releases from a transformer mounting pad, a burn pit for waste oil, use of PCB-contaminated soil as a base for the peripheral road, and an area where soil containing PCBs had been stockpiled. Because of the new information obtained after issuing the Proposed Plan, the U.S Army, United States EPA, and ADEC determined that SS044 had not been adequately characterized, and further investigation was recommended as part of the OUE RI.

The OUE RI was conducted in 2002 and 2003 to address the nature and extent of PCBs in soil and VOCs in groundwater (CH2M HILL, 2004). The highest level of PCBs detected

(99.9 mg/kg) was confined to a small area less than 1 square meter in size next to the transformer mounting pad. During the OUE RI, only two compounds were detected in groundwater that exceeded MCLs: benzene and TCE. Benzene was detected at a concentration of 8.2 µg/L in 2002 at location AP-2983. However, in 2003, benzene was detected at a concentration of 1.6 µg/L, which was less than the MCL of 5 µg/L.

In 2003, a limited excavation of PCBs in surface soil around the transformer mounting pad was completed under the TSCA self-implementing procedure for cleanup and disposal of PCB remediation waste (40 CFR 761.61(a)(4)(v)). Approximately 50 cubic yards of PCB-contaminated surface soil in the vicinity of the transformer pad were excavated from the site and disposed of at a TSCA-regulated landfill. Post-excavation samples contained PCBs less than the TSCA cleanup level for low-occupancy areas (25 mg/kg). The highest post-removal sample result was 14.1 mg/kg located at 1 foot bgs. Geotextile fabric was placed over the excavation, and was then covered with clean backfill.

PCBs remain in soil at concentrations above the levels for high-occupancy areas (1 mg/kg unrestricted), but below the TSCA Cleanup Level for low-occupancy areas (25 mg/kg). SS044 is currently considered a low-occupancy area. Because of the remaining PCB contamination above 1 mg/kg, internal administrative controls were put in place at the site.

Historically, TCE was detected in shallow groundwater beneath Building 35-752 at only monitoring well AP-3231 (11 µg/L in 1996 and 8.60 µg/L in 2002 [CH2M HILL, 2004]) at concentrations above the MCL of 5 µg/L. TCE concentrations at AP-3231 have decreased from 5 µg/L in 2008 to 0.77 µg/L in 2013 (USAF, 2014g).

18.1.1 Geology and Hydrology

The subsurface geology associated with SS044 consists of sandy gravel, with a shallow unconfined aquifer approximately 13 to 38 feet bgs (USAF, 2014h). Groundwater beneath SS044 is not used for household, recreational, or industrial uses at the site. The nearest surface water to the site is Ship Creek, which is approximately 0.3 mile south of the site. Ship Creek serves as the main source of drinking water for JBER; the drinking water intake is located over 3.5 miles upstream (upgradient) of the point where SS044 is closest to Ship Creek.

18.2 REGULATORY REQUIREMENTS

The remedy selected for SS044 in the OUE ROD is No Further Action (NFA) (USACE, 2005). To ensure the protectiveness of the NFA decision, the OUE ROD also required monitoring of groundwater and site conditions during five-year reviews.

18.3 2014 FIELD ACTIVITIES

An LUC inspection was performed at SS044 on July 31, 2014. No issues were identified during the inspection. A copy of the 2014 LUC inspection form is provided in Appendix B.

18.4 SITE SUMMARY AND RECOMMENDATIONS

No deficiencies were observed during the LUC inspection in 2014. LUC inspections will continue to be conducted annually in accordance with the OUE ROD (USAF, 2005a).

18.4.1 Five-Year Review

Consistent with the National Contingency Plan (NCP), five-year reviews are required because the remedial action resulted in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for UU/UE. PCBs remain in soil at concentrations that do not allow for UU/UE. To date, three CERCLA five-year reviews have been performed for JBER-Richardson (which includes SS044), in 2003, 2008, and 2013.

No recommendations specific to SS044 were made in the *Third CERCLA Five-Year Review Report for JBER-Richardson, Alaska* (USAF, 2013b).

18.4.2 Recommendations

Site SS044 is identified as a **Green** priority. NFA and continuation of internal administrative control inspections are recommended for this site. One round of groundwater sampling is recommended for 2017, prior to the Five-Year review.

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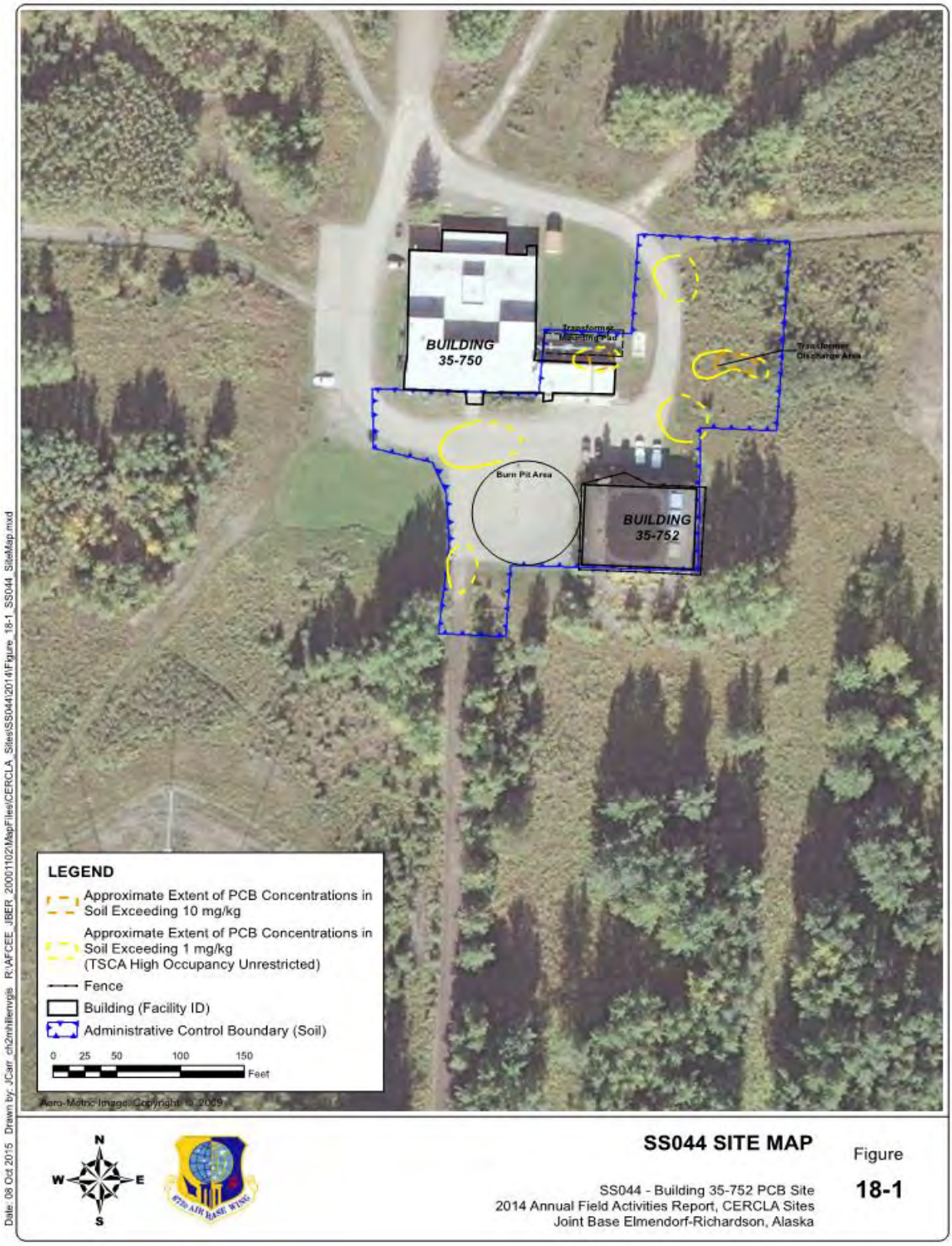
Figure 18-1 SS044 Site Map with Analytical Data



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19.0 XE023 (EOD AREA [2 EA] [OB/OD PAD])

PBC Performance Objectives: Design and Implement Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2019

19.1 SITE DESCRIPTION

JBER-R Site XE023 is a former 10-acre gravel Open Burn/Open Detonation (OB/OD) Pad that is physically located within the eastern boundary of an active military munitions impact area, Eagle River Flats (ERF) firing range (Figure 1-1). The site is regulated as part of Operable Unit C (OUC). The site was used from 1956 to 1988 to dispose of expired or unwanted explosive materials and ammunition (CH2M HILL, 1997). Some of the explosive materials included fuses, 105- and 40-millimeter (mm) high-explosive projectiles, smoke pots, mortar rounds, star clusters, flares, booby traps, blasting caps, detonation cord, mines, rocket motors, claymore C4, 40-pound shape charges, mine AP M16, phentaerythritol tetranitrate detonation cord, smoke grenades, hand grenades, incendiary box liners for safes, thermite, and propellant bags. On at least one occasion, military police requested destruction of a small quantity of potassium and sodium chlorate. Materials from non-military sources occasionally destroyed on the OB/OD Pad included dynamite (supplied by the Alaska State Troopers), explosives (supplied by an oil service company in Kenai), 105-mm projectiles (supplied by Alyeska Ski Resort), and various flammable solids, including sodium, red phosphorus, and yellow phosphorus (supplied by ADEC). Ordnance disposal by detonation would tend to spread shrapnel and explosives over adjacent areas of the pad surface. Existing records indicate that no liquids were disposed at the XE023 OB/OD Pad. During the 1960s, smaller pieces of ordnance were ignited on the ground surface or in pits using diesel fuel (EMCON Alaska, Inc. [EMCON], 1993).

In recent years, XE023 has been used primarily for the storage of nonhazardous equipment related to the studies and cleanup efforts conducted at the adjacent ERF. A road, access-controlled by a gate located 0.25 mile from the pad, enters at the southeastern corner of the pad and provides the primary vehicular access to the site. XE023 is currently an inactive site (CH2M HILL, 1999).

COPCs in soil at the site consist primarily of un-combusted components of explosives and residues from the use of explosives including 2,4-dinitrotoluene and metals. Research Department Explosive (cyclotrimethylenetrinitramine) and High-velocity Military Explosive (cyclotetramethylene-tetranitramine) were detected in groundwater along with metals; however, all detected concentrations were below applicable EPA MCLs or ADEC groundwater cleanup levels. Metals (including arsenic, barium, chromium, lead, mercury, and zinc) have been detected in samples from all monitoring wells, and were within the range of background concentrations (USAF, 2013d and CH2M HILL, 1998).

19.1.1 Geology and Hydrology

Soil associated with XE023 consists of sandy gravel and gravelly sand. Based on groundwater monitoring data collected during the OU C RI, depth-to-groundwater beneath the XE023 ranges from 19 to 36 feet bgs, and the water table appears to be generally flat with a slight hydraulic gradient of 0.0004 foot per foot to the southwest (CH2M HILL, 1997). It is believed that the groundwater movement patterns are strongly influenced by the tides and Eagle River. The coarse-grained material suggests that precipitation infiltrates freely through the pad surface to the water table.

19.2 REGULATORY REQUIREMENTS

XE023 is regulated under CERCLA as part of OU C and is also a solid waste management unit as defined by the Resource Conservation and Recovery Act (RCRA).

XE023 is currently in an interim closure status. The selected remedy for the site is NFA. Institutional controls to monitor and control site access due to concerns about potential human exposure to unexploded ordnance are also in place (CH2M HILL, 1998).

19.3 2014 FIELD ACTIVITIES

An LUC inspection was performed at XE023 on August 20, 2014. No issues were identified during the inspection. A copy of the 2014 LUC inspection form is provided in Appendix B.

19.4 SITE SUMMARY AND RECOMMENDATIONS

No deficiencies were observed during the LUC inspection in 2014. Monitoring wells are present, but long-term monitoring and LUCs for groundwater are not part of the selected remedy. Wells will be inspected in 2016 to coincide with planned LTM work at XU022 after the site has been cleared for UXOs. LUC inspections will continue to be conducted annually in accordance with the OUC ROD (CH2M HILL, 1998).

19.4.1 Five-Year Review

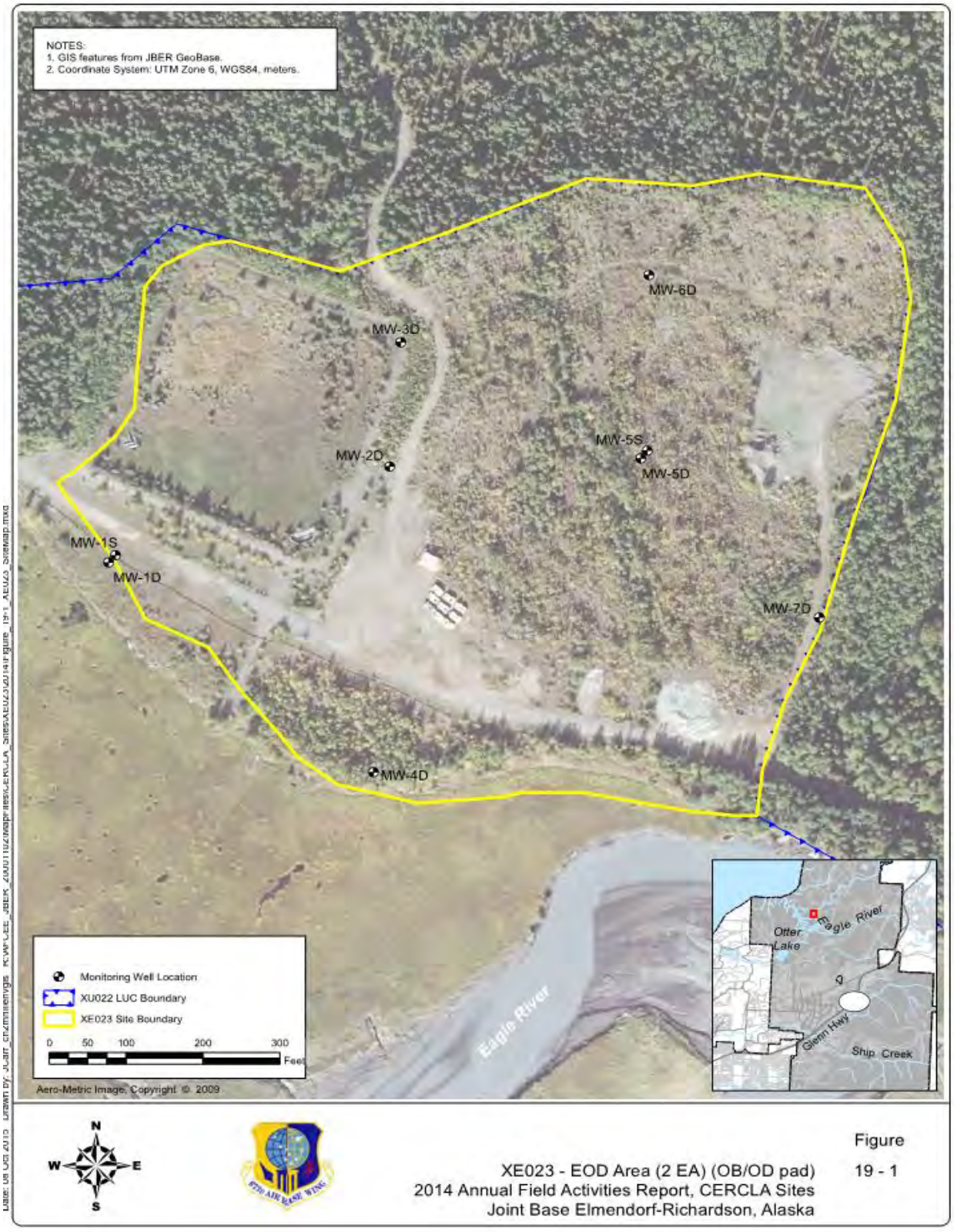
XE023 is required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. To date, three CERCLA five-year reviews have been performed for JBER-Richardson (which includes XE023), in 2003, 2008, and 2013.

No recommendations specific to XE023 were made in the *Third CERCLA Five-Year Review Report for JBER-Richardson, Alaska* (USAF, 2013b).

19.4.2 Recommendations

Site XE023 is identified as a **Green** priority. No further remedial action is necessary and continuation of LUC inspections are recommended for this site.

Figure 19-1 XU023 Site Map with Analytical Data



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20.0 XU022 (OUC/IMPACT AREA EAGLE RIVER FLATS)

PBC Performance Objectives: Design and Implement Optimized Exit Strategy for Site Closeout

Anticipated Achievement Date: 2019

20.1 SITE DESCRIPTION

JBER-Richardson site XU022 is an estuarine salt marsh at the mouth of the Eagle River (Figure 1-1). It is surrounded by forested uplands on the west, south, and east, and is bounded by the Knik Arm on the north. The Eagle River flows through the site from southeast to northwest, ultimately discharging into Knik Arm. Clunie and Otter Creeks also drain into ERF. Because of its wetlands and small, interconnected ponds, XU022 serves as an important staging ground for waterfowl during spring and fall migrations. In addition, the site supports local populations of fish, birds, mammals, and macro-invertebrates (primarily insects, snails, and crustaceans), as well as a population of wood frogs.

XU022 has been used for artillery and munitions training since the 1940s. Site access is restricted to personnel with appropriate site- specific training (on UXO, range procedures, and WP.) Site access is controlled by a locked gate. The most recent live-fire training exercises were performed on April 1-3 and 13-14, 2015.

XU022 contains numerous targets, as well as craters created by detonation of munitions in the wetlands and associated mud flats. During the 1980s, an unusually high number of waterfowl carcasses were discovered in the ERF marshes. Subsequent investigation revealed that white phosphorus (WP) particles were being ingested by the birds, causing their deaths. WP particles had been dispersed into the impact area during detonation of specific smoke munitions. WP is a smoke and incendiary agent that burns (oxidizes) and degrades readily in air. However, when WP particles are disbursed from munitions and come into contact with water, they are extinguished (without oxidizing) and settle out as seed-sized particles. Dabbling waterfowl, such as green-winged teal, northern pintails, and mallards that feed mainly on seeds and insects in shallow pond bottom sediments, consume WP particles while foraging for food, which results in waterfowl mortality. This discovery resulted in a nationwide U.S. Army ban on the use of WP in wetland impact areas.

Studies at XU022 have since indicated that concentrations of WP in sediment associated with a spent WP round ranged from thousands of micrograms per gram (µg/g) for sediment collected from within the spent rounds to hundreds of µg/g for sediment co-located (immediately surrounding) with the spent rounds, and to less than 10 µg/g in sediment within a few meters (m) of the spent rounds. Sediment with a concentration over 1 µg/g is likely to contain WP particles large enough to poison ducks (USACE, 2012).

20.1.1 Geology and Hydrology

Site XU022 is an estuarine salt marsh that was formed by the erosional force of Eagle River through the glacial alluvial deposits of the Anchorage lowland to create a deep valley that subsequently filled with sediment. The area has relative low relief with elevations ranging from 3 to 18 feet above mean sea level, and is subject to tidal flooding. Eagle River bisects the site with an average flow rate of 530 cubic feet per second, draining approximately 1,300 square miles of mountains and lowlands into the Knik Arm. Numerous channels and ponds also cut across XU022. Otter Creek, Clunie Creek and several small lakes also enter into the site (CH2M HILL, 1998), in addition to Eagle River.

20.2 REGULATORY REQUIREMENTS

The ROD for OUC was signed by the Army, EPA, and ADEC on September 30, 1998. The selected remedy outlined in the ROD was to reduce white phosphorus contamination by draining ponds and other water bodies with pumps in an effort to dry out the contaminated sediments causing the WP to sublimate and oxidize.

Two temporal RA-Os were established for OUC as follows:

1) Within 5 years of the ROD being signed, reduce the dabbling duck mortality rate attributable to white phosphorus to 50 percent of the 1996 mortality rate attributable to white phosphorus. Radio tracking and aerial surveys suggest that about 1,000 birds died from white phosphorus at ERF in 1996. Therefore, the allowable number of duck deaths from white phosphorus would be approximately 500.
2) Within 20 years of the ROD being signed, reduce the mortality attributable to white phosphorus to no more than 1 percent of the total annual fall population of dabbling ERF ducks. Currently, that population is about 5,000. Therefore, the allowable number of duck deaths from white phosphorus would be approximately 50. This long-term goal could be adjusted based on future population studies conducted during the monitoring program.

The mortality rate of dabbling ducks at XU022 indicates that both RA-Os have been achieved. Refinement of the mortality model in 2005 reduced the calculated 1996 mortality rate from 1,000 to 655 ducks (Bigl and Collins, 2007). Therefore, to meet the short-term RA-O, the allowable number of duck deaths attributable to WP needed to be less than 327 by 2003. Duck mortality rates since 1999 have been less than the target number. Based on the mortality data, the short-term RA-O has been successfully met. The calculated mortality rate has been below 1 percent since 2006, and the upper bound of the conservative estimated range was also below 1 percent in 2008, 2010, and 2011. Overall, waterfowl mortality resulting from WP poisoning has decreased significantly in ERF since remedial activities have begun. This decreasing trend is expected to continue following the capping operations performed in February 2013. Mortality monitoring will next be conducted in 2016.

Remedial action (active pond pumping/draining) began in 1999. Although treated pond acreage is not a specific RA-O for this project, it is a good indicator that WP residual matter is being remediated. The ROD identified 57 acres as contaminated or potentially contaminated at ERF. Monitoring activities performed since 1999 have indicated that some areas previously thought to be contaminated were not, whereas other areas thought to be uncontaminated were not. The current revised estimate of the total area that had been contaminated by WP (before treatment) is approximately 47 acres. Pumping and draining remediation activities have successfully treated most of the contaminated area. Smaller hot spots with WP concentrations above the target of 1 µg/g in areas that could not be drained or pumped consisted of less than 0.5 acre; these areas were remediated through capping.

JBER Environmental maintains a geographic information system (GIS) database with information on all of the contaminated sites on JBER. LUCs are in place restricting site access, construction, and road maintenance, as well as requiring training for personnel who work at OU C source areas, as long as site conditions do not allow for unlimited use/unrestricted exposure. JBER Environmental is responsible for ensuring that ICs are maintained. Evidence of trespassing by unauthorized individuals was not detected in 2014. ICs will remain in place as long as hazardous substances remain onsite at levels that preclude unrestricted use.

20.3 2014 FIELD ACTIVITIES

An LUC inspection was performed at XU022 on August 20, 2014. No issues were identified during the inspection. A copy of the 2014 LUC inspection form is provided in Appendix B.

20.4 SITE SUMMARY AND RECOMMENDATIONS

No deficiencies were observed during the LUC inspection in 2014. LUC inspections will continue to be conducted annually in accordance with the OUC ROD (CH2M HILL, 1998).

20.4.1 Five-Year Review

XU022 is required to have CERCLA five-year reviews conducted until such time as the cleanup goals are achieved. The purpose of the five-year review is to evaluate the implementation and performance of the remedial actions. To date, three CERCLA five-year reviews have been performed for JBER-Richardson (which includes XU022), in 2003, 2008, and 2013.

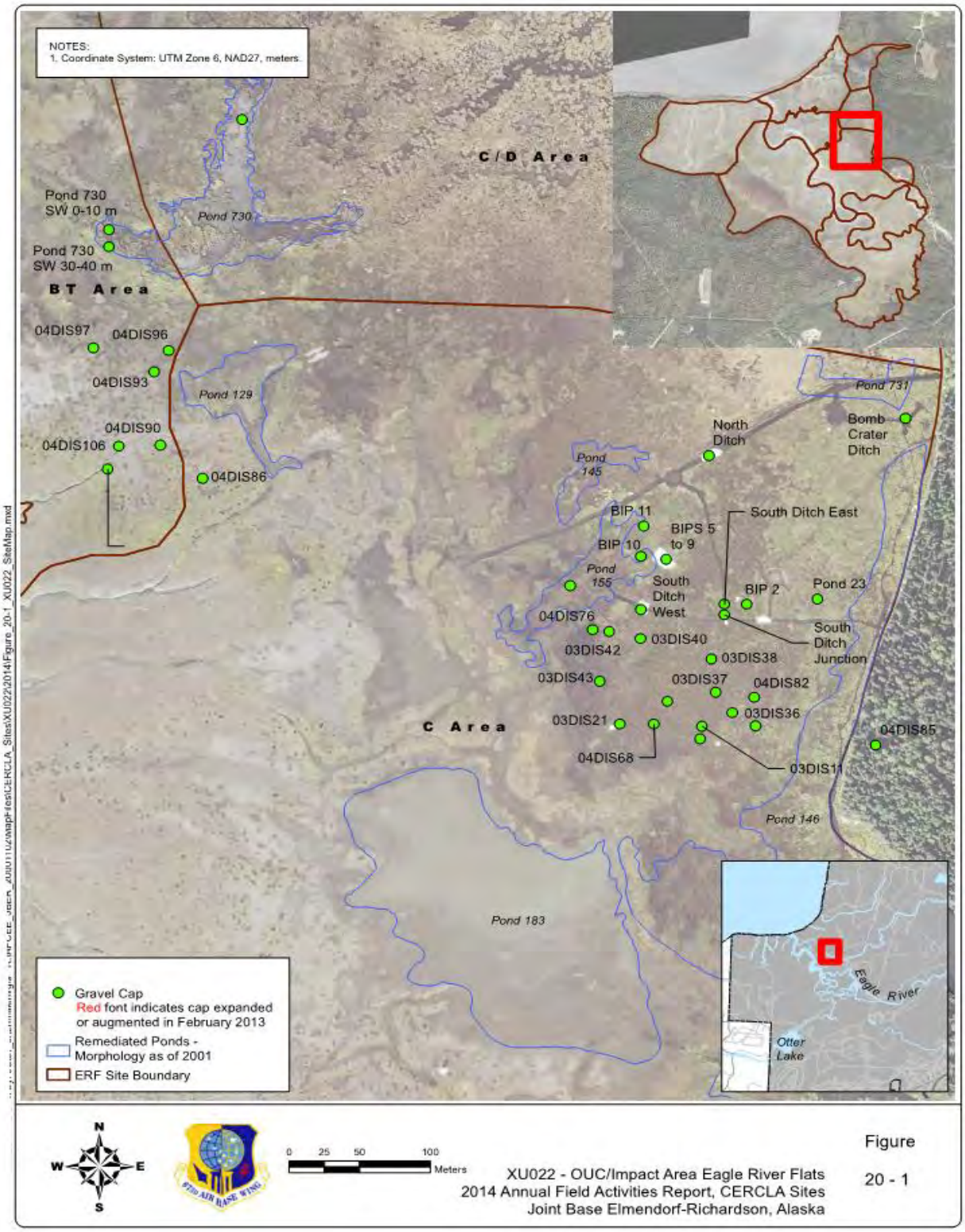
The *Third CERCLA Five-Year Review Report for JBER-Richardson, Alaska* (USAF, 2013b) for XU022 recommended that the USAF readdress waterfowl populations upon completion of seasonal field activities and compare population numbers with previous surveys to evaluate for any potential bias. A total of 21 aerial census surveys were conducted from August 16 to October 29, 2012, to determine the fall 2012 waterfowl population. In comparison, 24 aerial surveys were conducted in 2011, and 28 census surveys were conducted in 2010 during similar time periods. Observed waterfowl species were similar in types and relative numbers as in previous years. Details of the 2012 aerial census survey results and a comparison of population numbers from previous surveys are included in the *2012-2013 Remedial Action Summary Report*

for XU022 – Operable Unit C, Eagle River Flats Joint Base Elmendorf-Richardson, Alaska (USAF, 2013a). Similar analyses will be performed based on the forthcoming 2016-2017 monitoring efforts.

20.4.2 Recommendations

Site XU022 is identified as a **Green** priority. Long-term monitoring and continuation of LUC inspections are recommended for this site.

Figure 20-1 XU022 Site Map with Analytical Data



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APPENDIX A
Field Monitoring Records

A-1 JBER-Elmendorf Field Records

- Table of Snow-Flagged Monitoring Wells
- Table of Monitoring Well Survey Data
- Groundwater, Surface Water and Seep Sample Sheets
- 2014 Field Parameters
- Field Notes
- LF04 Debris Removal Photograph Log and Debris Removal Receipt
- OU5 Wetland Inspection Forms and Photo Log

A-2 JBER-Richardson Field Records

- Sample Collection Forms
- Field Notes

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A-1 JBER-Elmendorf Field Records

- Table of Snow-Flagged Monitoring Wells
- Table of Monitoring Well Survey Data
- Groundwater, Surface Water and Seep Sample Sheets
- 2014 Field Parameters
- Field Notes
- LF04 Debris Removal Photograph Log and Debris Removal Receipt
- OU5 Wetland Inspection Forms and Photo Log

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CERCLA Site Snow Pole Installation and Removal

Site/Plume	Well ID	Removed Spring 2014	Installed Fall 2014
LF04 South	OU6MW-61	x	x
	OU6MW-63	x	x
WP14	14MW120	x	x
	14MW121	x	x
	OU6MW-46	x	x
	OU6MW-67	Behind Fence	
	OU6MW-91		
	OU6MW-92		
	OU6MW-93		
ST41	ST41-10R	x	x
	ST41-20	Left in Place	x
	ST41-30	Left in Place	x
DP98	41755WL-05	x	x
	41755WL-04	x	x
	41755WL-09	Left in Place	x
	41755WL-06	x	x
	41755WL-07	x	x
SD025	OU4MW-8R		
SD015	OU6MW-17	No Pole	Off Road
FT023	OU4MW-11		
LF059	LF59MW-02	x	x
	LF59MW-03	x	x
Kenney Avenue	403WL-01	x	x
ST037	OU5MW-05	Unknown	Not Found
	OU5MW-11	Unknown	Behind Fence
ST401	401WL-03	x	x
Sentry Wells	OU5MW-13	x	x
	OU5MW-14	x	x
	OU5MW-09	x	x
	NS3-02	x	x
Early Warning Wells	OU5MW-01	x	x
SP1-02	SP1-02	x	x

Monitoring Well Survey

Monitoring Well ID	AFID	State/CERCLA Site	State Plane Coordinate (NAD83 SPZ4)		NAD83 Geographic Position		UTM Coordinate (Zone 6)		Elevation (ft)			Well Type
			North (ft)	East (ft)	Latitude	Longitude	North (m)	East (m)	GND Elev	Top Casing	Top PVC	Comments
41755WL-08	DP098	CERCLA	2654761.81	1667591.33	N 61 15 58.43694	W 149 50 44.19326	6795765.600	347416.389	169.30	173.42	173.37	Stick Up
FP-52	FT023	CERCLA	2653983.64	1674898.50	N 61 15 50.58074	W 149 48 14.78734	6795426.433	349630.340	209.30	209.30	208.77	Flush Mount
FP-56	FT023	CERCLA	2653939.11	1674797.97	N 61 15 50.14521	W 149 48 16.84624	6795414.282	349599.106	207.77	207.77	207.15	Flush Mount
OU4W-11	FT023	CERCLA	2653738.51	2653738.51	N 61 15 48.15748	W 149 48 08.41321	6795347.427	349722.031	210.10	213.03	212.65	Stick Up
GP-02A	OU1 LF	CERCLA	2645914.83	1679670.29	N 61 14 30.96930	W 149 46 37.75968	6792902.958	350970.333	204.67	208.08	207.67	Stick Up (Vapor)
OU1MW-19R	OU1 LF	CERCLA	2645577.97	1679221.20	N 61 14 27.66695	W 149 46 46.96105	6792806.676	350828.886	200.39	203.94	203.54	Stick Up
OU1MW-23	OU1 LF	CERCLA	2647173.30	1680153.54	N 61 14 43.34627	W 149 46 27.79463	6793279.365	351135.072	212.06	208.97	208.54	Stick Up
OU6MW-17	SD015	CERCLA	2657813.13	1679274.38	N 61 16 28.15567	W 149 46 45.02924	6796531.175	351016.249	280.90	283.08	282.71	Stick Up
421WL-01	SD025	CERCLA	2652072.86	1672518.52	N 61 15 31.83141	W 149 49 03.57092	6794877.951	348878.967	192.21	195.17	194.28	Stick Up
421WL-02	SD025	CERCLA	2651952.02	1672514.69	N 61 15 30.64149	W 149 49 03.65605	6794841.212	348876.111	192.52	195.71	195.36	Stick Up
SD025-MW02	SD025	CERCLA	2651882.00	1672407.43	N 61 15 29.95486	W 149 49 05.85328	6794821.393	348842.474	192.50	195.76	195.09	Stick Up
SD025-MW02	SD025	CERCLA	2651881.58	1672407.52	N 61 15 29.95067	W 149 49 05.85148	6794821.262	348842.495	192.37	195.50	194.78	Stick Up
SD025-MW03	SD025	CERCLA	2651979.03	1672208.40	N 61 15 30.91581	W 149 49 09.91745	6794853.719	348783.233	190.48	193.73	193.06	Stick Up
SD025-MW04	SD025	CERCLA	2652297.54	1672312.25	N 61 15 34.04967	W 149 49 07.77595	6794949.245	348819.308	204.18	206.66	206.19	Stick Up
OU4MW-08R	SD025	CERCLA	2652192.59	1672385.38	N 61 15 33.01413	W 149 49 06.28651	6794916.267	348840.105	194.50	196.96	196.64	Stick Up
SD025-MW01	SD025	CERCLA	2652214.44	1672459.03	N 61 15 33.22729	W 149 49 04.77915	6794921.890	348862.837	197.01	200.48	200.15	Stick Up
ST600-MW04	SO525	CERCLA	2647721.91	1678943.09	N 61 14 48.78950	W 149 46 52.49804	6793463.334	350774.199	204.09	206.99	206.79	Stick Up
GW-5A	ST037	CERCLA	2653539.30	1674825.60	N 61 15 46.20710	W 149 48 16.60557	6795292.164	349601.926	208.10	209.70	209.55	Stick Up
NS3-02	ST037	CERCLA	2643598.96	1673579.32	N 61 14 08.35138	W 149 48 42.37849	6792283.038	349083.412	121.99	124.79	124.46	Stick Up
OU5MW-09	ST037	CERCLA	2643497.07	1672677.30	N 61 14 07.37324	W 149 49 00.81537	6792264.633	348807.347	117.66	119.72	119.39	Stick Up
OU5MW-13	ST037	CERCLA	2641780.90	1669914.12	N 61 13 50.54543	W 149 49 57.36514	6791780.753	347942.029	105.10	107.10	106.67	Stick Up
ST41-10R	ST041	CERCLA	2649590.51	1664362.73	N 61 15 07.58105	W 149 51 50.44809	6794236.240	346361.010	239.00	242.11	241.79	Stick Up
ST41-25	ST041	CERCLA	2648628.94	1664451.52	N 61 14 58.10966	W 149 51 48.67391	6793942.220	346374.593	220.27	223.51	223.01	Stick Up
539MW-01	CG539	STATE	2650251.31	1671832.80	N 61 15 13.91153	W 149 49 17.69428	6794332.930	348644.701	183.50	183.45	183.14	Flush Mount
539MW-02	CG539	STATE	2650958.26	1670777.27	N 61 15 20.90143	W 149 49 39.23645	6794562.945	348333.210	180.30	180.29	179.90	Flush Mount
702WL-01	CG702	STATE	2664219.24	1675910.63	N 61 17 31.34930	W 149 47 53.44113	6798528.719	350081.729	126.60	126.56	126.34	Flush Mount
702WL-02	CG702	STATE	2664161.66	1675916.42	N 61 17 30.78208	W 149 47 53.32625	6798511.106	350082.686	123.40	123.43	123.12	Flush Mount
702WL-03	CG702	STATE	2664122.94	1675884.11	N 61 17 30.40175	W 149 47 53.99007	6798499.769	350072.307	118.30	118.26	118.08	Flush Mount
702WL-04	CG702	STATE	2664111.33	1675959.91	N 61 17 30.28511	W 149 47 52.43921	6798495.174	350095.224	119.60	119.57	119.07	Flush Mount
702WL-05	CG702	STATE	2664082.80	1675865.06	N 61 17 30.00704	W 149 47 54.38255	6798487.815	350065.945	114.40	114.44	113.64	Flush Mount
702WL-07	CG702	STATE	2664124.07	1675816.45	N 61 17 30.41494	W 149 47 55.37497	6798501.060	350051.722	116.10	119.09	118.85	Stick Up
702WL-10	CG702	STATE	2664011.24	1675859.20	N 61 17 29.30251	W 149 47 54.50702	6798466.109	350063.160	115.40	118.51	117.85	Stick Up
702WL-12	CG702	STATE	2664033.52	1675744.08	N 61 17 29.52541	W 149 47 56.86206	6798474.503	350028.421	115.70	118.54	118.22	Stick Up
702WL-14	CG702	STATE	2664105.33	1676006.66	N 61 17 30.22460	W 149 47 51.48264	6798492.693	350109.374	120.00	120.01	119.49	Flush Mount
702WL-16	CG702	STATE	2663820.42	1675662.39	N 61 17 27.42930	W 149 47 58.54759	6798410.764	350000.566	104.90	107.90	107.80	Stick Up
702WL-19	CG702	STATE	2663727.69	1675766.18	N 61 17 26.51297	W 149 47 56.42895	6798381.078	350030.869	103.10	106.82	106.96	Stick Up (PVC Jacked)
702WL-20	CG702	STATE	2664167.17	1675850.94	N 61 17 30.83833	W 149 47 54.66626	6798513.700	350062.827	126.60	126.57	126.22	Flush Mount
407MW-01	SO549	STATE	2653318.71	1674777.66	N 61 15 44.03616	W 149 48 17.29941	6795225.671	349584.244	206.59	206.59	206.20	Flush Mount
59WL-30[a]	ST032	STATE	2649954.11	1667988.97	N 61 15 11.08181	W 149 50 36.29586	6794296.217	347470.199	227.44	231.34	231.02	Stick Up
59WL-47	ST032	STATE	2650998.69	1667953.92	N 61 15 21.36955	W 149 50 36.96139	6794614.754	347474.139	298.40	301.10	300.29	Stick Up
59WL-48	ST032	STATE	2649483.11	1666922.91	N 61 15 06.46806	W 149 50 58.11316	6794167.722	347139.020	225.50	229.52	229.23	Stick Up
59WL-49	ST032	STATE	2650513.12	1668757.08	N 61 15 16.56849	W 149 50 20.56416	6794455.674	347711.888	228.50	232.12	231.83	Stick Up
59WL-50	ST032	STATE	2650467.34	1668736.57	N 61 15 16.11815	W 149 50 20.98580	6794442.022	347705.003	225.60	229.52	229.07	Stick Up
60WL-07	ST048	STATE	2646546.83	1674487.19	N 61 14 37.35578	W 149 48 23.64945	6793167.886	349401.070	175.65	179.07	178.57	Stick Up
62WL-02R	ST068	STATE	2648388.40	1674705.04	N 61 14 55.48503	W 149 48 19.08488	6793725.545	349493.159	187.86	190.72	190.44	Stick Up
TU091MW-01	TU091	STATE	2646421.06	1675671.66	N 61 14 36.08208	W 149 47 59.44886	6793113.024	349759.946	185.00	185.01	184.52	Flush Mount

Note:

a - The top of PVC elevation for 59WL-30 was taken on top of the "domed" cap, which couldn't be removed for measurement.

ft = feet, m = meter, GND = ground

Horizontal Control Statement:

The basis of horizontal control is an NGS OPUS (Online Positioning User System) solution on NGS monument "N1B". The individual sites were surveyed utilizing both Real Time Kinetics (RTK)solutions. All data was consistent with NGS first order accuracies. The survey was performed under the supervision of Tony Hoffman, Alaska Registered Professional Land Surveyor #9020.

Vertical Control Statement:

The vertical datum is NAVD88, established by submitting multiple static GPS sessions on "NIB", an NGS Survey Monument located on the east end of the main runway, east of Talley Avenue, to the NGS OPUS website. The established NAVD88 elevation of "NIB" is 221.89. The NGS PID (Point Identification) for "N1B" is UV4436

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-02
Project Location:	JBER-E	Sample No.:	14DP098-41755WL02-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, H. Graham
Date/Time:	9/17/2014 10:55	Weather:	50F, Overcast, light drizzle

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9:30	19.51 ft ☑ Meas. ☐ Hist.	7.93 ft Initial	11.58 ft	1.89

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.07

Begin Purge: Time: 09:34 AM

Total Volume Purged: 5.7

End Purge: Time: 10:54 AM

Well Volumes Purged: 3.02

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/17/2014 10:55

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Exceeded well draw down threshold and purged three well volumes (5.7) and then sampled for VOCs.

Sampler Signature: Moana Leirer

Date: 9/17/2014 10:55 Well ID: 41755WL-02

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
9:44	8.65	0.5	10.06	696	0.39	4.69	159.1	15.9
9:49	8.65	0.8	10.27	700	0.22	5.01	129.3	17.1
9:54	8.65	1.1	10.33	700	0.19	5.28	108	13.2
9:59	8.81	1.4	10.39	693	0.15	5.45	96.9	13.6
10:04	9.05	1.8	10.37	685	0.16	5.55	85.8	14.9
10:08	9.12	2.2	10.33	679	0.14	5.60	79.5	13.8
10:14	9.10	2.5	10.30	677	0.13	5.65	74.5	10.8
10:19	9.10	2.9	10.38	677	0.11	5.68	71.4	9.00
10:24	9.16	3.1	10.37	675	0.09	5.73	68.3	7.38

**Stopped recording parameters after draw down threshold was exceeded

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-03
Project Location:	JBER-E	Sample No.:	14DP098-41755WL03-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/17/2014 10:50	Weather:	50F, Overcast, light drizzle

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9:33	29.18 ft ☑ Meas. ☐ Hist.	7.03 ft Initial	22.15 ft	3.61

**** Product in well. Depth to product = 7.02 ft**

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☐ Submersible Pump ☑ Bailer ☐ Other:

Purge Rate: see note

Begin Purge: Time: 09:51 AM

End Purge: Time: 10:38 AM

Total Volume Purged: 12.00

Well Volumes Purged: 3.00

Purge Water Disposed: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/17/2014 10:50

Sample Collection Method: ☐ Pump Type: Dedicated ☐ Y ☐ N ☑ Bailer ☐ Other:

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
Submersible pump would not pump water due to heavy product and viscosity. After repeated attempts, the pump just kept stopping. Abandoned pumping and used a bailer to purge and sample well. Removed three well volumes and then sampled the well. Product was detected at 7.02 ft below TOC

Sampler Signature: Moana Leirer

Date: 9/17/2014 10:50 Well ID: 41755WL-03

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
10:18		4.00	8.74	1.155	4.23	6.84	-6.26	140
10:23		8.00	8.26	1.162	7.46	6.83	-57.8	621
10:38		12.00	7.80	1.098	6.67	6.78	-70.9	621

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-04
Project Location:	JBER-E	Sample No.:	14DP098-41755WL04-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/16/2014 12:52	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
12:15	33.28 ft ☑ Meas. ☐ Hist.	17.7 ft Initial	15.58 ft	2.54 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.10

Begin Purge: Time: 12:25 PM

End Purge: Time: 12:50 PM

Total Volume Purged: 2.5

Well Volumes Purged: 1

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/16/2014 12:52

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): Hydrogen Sulfide Gray

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Date: 9/16/2014 12:52 Well ID: 41755WL-04

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
12:35	17.76	1.00	7.84	1.120	0.40	7.01	-65.5	14.6
12:40	17.57	1.50	8.09	1.182	0.28	7.07	-77.1	Malfunction
12:45	17.67	2.00	8.21	1.188	0.21	7.09	-84.8	9.02
12:50	17.70	2.50	8.07	1.184	0.20	7.09	-86.6	Malfunction

Notes :

turbidity meter malfunctioned.

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-05
Project Location:	JBER-E	Sample No.:	14DP098-41755WL05-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/16/2014 11:36	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11:00	26.51 ft ☑ Meas. ☐ Hist.	14.67 ft Initial	11.84 ft	1.93 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.10

Begin Purge: Time: 11:05 Total Volume Purged: 3

End Purge: Time: 11:35 Well Volumes Purged: 1.55

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/16/2014 11:36

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): Strong Hydrocarbon odor

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
6	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

SW8260B VOCs. Sheen. Water color - red

Additional Samples: 14DP098-41755WL05-GW-1

Sampler Signature: Jess Young

Date: 9/16/2014 11:36 Well ID: 41755WL-05

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
11:15	14.79	1.00	8.42	1.074	0.63	6.55	-43.2	22.5
11:20	14.8	1.50	8.39	1.031	0.35	6.54	-44.6	20.7
11:25	14.81	2.00	8.65	1.015	0.30	6.53	-45.5	Malfunction
11:30	14.81	2.50	8.94	1.007	0.29	6.52	-44.8	Malfunction
11:35	14.82	3.00	8.87	0.990	0.25	6.50	-44.7	23.6

Notes :

Turbidity meter malfunction

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-07
Project Location:	JBER-E	Sample No.:	14DP098-41755WL07-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/16/2014 9:46	Weather:	Unknown

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9:46	17.6 ft ☑ Meas. ☐ Hist.	6.71 ft Initial	10.89 ft	1.78 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.091

Begin Purge: Time: 08:50 AM

Total Volume Purged: 5

End Purge: Time: 09:45 AM

Well Volumes Purged: 2.8

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/16/2014 9:46

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☑ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Well exceeded drawdown. Will purge 3 well volumes (+/-5 gal)

Sampler Signature: Jess Young

Date: 9/16/2014 9:46 Well ID: 41755WL-07

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
9:00	7.40	0.5	9.03	0.267	0.99	6.01	60.6	24.3
9:05	7.65	1.0	9.26	0.249	0.78	6.01	53.5	15.1
9:10	7.80	1.5	9.44	0.239	0.62	5.97	48.1	8.01
9:15	8.21	2.0	9.50	0.24	0.41	5.99	38.0	3.36
9:20	8.55	2.5	9.64	0.241	0.33	5.99	34.6	3.43
9:25	8.65	3.0	9.54	0.259	0.25	6.02	32.7	2.90
9:30	8.75	3.5	9.43	0.276	0.20	6.05	29.8	2.76
9:35	8.71	4.0	9.41	0.284	0.51	6.07	25.4	2.56
9:40	8.72	4.5	9.36	0.287	0.63	6.09	24.7	2.72
9:45	8.81	5.0	9.33	0.291	1.41	6.13	26.4	2.42

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-08
Project Location:	JBER-E	Sample No.:	14DP098-41755WL08-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/17/2014 16:32	Weather:	50F, Overcast, light drizzle

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
14:30	11.44 ft ☑ Meas. ☐ Hist.	3.5 ft Initial	7.94 ft	1.3 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.09

Begin Purge: Time: 15:44 Total Volume Purged: 3.9

End Purge: Time: 16:29 Well Volumes Purged: 3.0

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/17/2014 16:30

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Exceeded the 0.33 draw drown threshold. Pumped three well volumes (~4gallons) and then sampled for VOCs.

Sampler Signature: Moana Leirer

Date: 9/17/2014 16:32 Well ID: 41755WL-08

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
15:48	4.54	0.25	9.64	0.350	5.53	6.34	103.7	10.4
15:51	4.55	0.4	9.46	0.382	4.95	6.08	105.3	9.00
15:54	4.50	0.6	9.26	0.441	3.57	5.88	109.1	10.2
15:57	4.44	0.8	9.15	0.482	1.91	5.82	108.2	16.9
16:01	4.41	1.0	8.94	0.506	1.46	5.88	101.2	20.1
16:08	4.51	1.5	8.71	0.525	0.96	5.92	98.4	19.1
16:18	5.22	2.25	8.40	0.504	1.68	6.95	92.5	12.8
16:29	5.86	3.9	7.36	0.532	0.88	5.82	102.6	8.01

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	41755WL-09
Project Location:	JBER-E	Sample No.:	14DP098-41755WL09-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/16/2014 10:36	Weather:	50F

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
10:00	16.75 ft ☑ Meas. ☐ Hist.	4.13 ft Initial	12.62 ft	2.05 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 10:10 AM

End Purge: Time: 10:35 AM

Total Volume Purged: 2.00

Well Volumes Purged: 0.98

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/16/2014 10:36

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Well exceeded drawdown. Will purge 6 gal. Drawdown stabilized and well began to recover.
Collected when parameters stabilized.

Sampler Signature: Jess Young

Date: 9/16/2014 10:36 Well ID: 41755WL-09

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
10:20 AM	5.36	0.50	7.00	0.452	2.35	7.55	85.9	3.63
10:25 AM	5.41	1.00	6.91	0.452	1.79	7.58	75.9	4.17
10:30 AM	5.35	1.50	6.96	0.462	1.56	7.59	81.3	3.66
10:35 AM	5.23	2.00	7.11	0.467	1.36	7.59	79.8	2.64

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	DP98INJ-02
Project Location:	JBER-E	Sample No.:	14DP98INJ-DP98INJ02-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/17/2014 13:00	Weather:	50F, Overcast, light drizzle

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9/16/14 13:00	30.00 ☑ Meas. ☐ Hist.	14.72 Initial	15.28	2.49

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: N/A

Begin Purge: Time: N/A Total Volume Purged: N/A

End Purge: Time: N/A Well Volumes Purged: N/A

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/17/2014 13:00

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☐ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☑ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Well historically goes dry and does not respond well to low flow sampling so purged well dry on 9/16/2014. Collected grab sample on 9/17/2014. Did not collect water quality parameters since the well historically goes dry.

Sampler Signature: Moana Leirer

Date: 9/17/2014 13:00 Well ID: DP98INJ-02

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU4W-11
Project Location:	JBER-E	Sample No.:	14FT023-OU4W11-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/18/2014 14:50	Weather:	Cloudy

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
14:21	57.8 ft ☑ Meas. ☐ Hist.	43.93 ft Initial	22.87 ft	2.30

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 14:29 Total Volume Purged: 1.6

End Purge: Time: 14:49 Well Volumes Purged: 1.43

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/19/2014 14:50

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
12	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampled for VOCs.

Additional Samples: 14FT023-OU4W11-GW-1, 14FT023-OU4W11-GW-MS, 14FT023-OU4W11-GW-MSD

Sampler Signature: Moana Leirer

Date: 9/18/2014 14:50 Well ID: OU4W-11

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
14:39	43.95	1.00	6.53	0.821	1.42	6.62	6.5	5.73
14:41	43.95	1.20	6.85	0.821	1.21	6.64	2.0	4.98
14:44	43.95	1.40	7.14	0.824	1.33	6.66	-4.2	5.17
14:48	43.95	1.60	7.48	0.829	1.34	6.66	-11.6	4.57

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU6MW-67
Project Location:	JBER	Sample No.:	14WP014-OU6MW67-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	A. Thompson
Date/Time:	11/4/2014 12:35	Weather:	Sunny, clear, 25F

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11:40	87.2 ft ☑ Meas. ☐ Hist.	64.29 ft Initial	22.91 ft	3.7 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: Unknown

Begin Purge: Time: 12:02 Total Volume Purged: 2.3

End Purge: Time: 12:32 Well Volumes Purged: 1.6

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 12:35

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
9	40mL VOA	☑ Glass ☐ Plastic	SW8260
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
Additional samples taken for MS/MSD.

Sampler Signature: Anne Thompson

Date: 11/4/2014 12:35 Well ID: OU4MW-67

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
12:14	64.59	0.9	5.06	0.444	0.95	6.93	-107.4	24.9
12:18	64.42	1.2	4.97	0.449	0.71	6.96	-109.1	20.5
12:22	64.51	1.5	4.81	0.45	0.79	6.96	-106.9	16.67
12:26	64.41	2.0	4.80	0.449	0.82	6.96	-106.1	14.60
12:29	64.41	2.1	4.81	0.448	0.83	6.96	-105.3	14.28
12:32	64.41	2.3	4.89	0.447	0.82	6.96	-104.9	13.05

Notes :

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	LF04SP-02
Project Location:	JBER-E	Sample No.:	14LF04-LF04SP02-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, L. Hermanns
Date/Time:	9/11/2014 10:15	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:

Sample Time: 10:15

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
8	1L Amber	☑ Glass ☐ Plastic	SW8270D SIMS PAHs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Collected a duplicate sample (14LF04-LF04SP02-GW-0) and MS/MSD for PAHs only.

Sampler Signature: Moana Leirer

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	LF04SP-02DG
Project Location:	JBER-E	Sample No.:	14LF04-LF04SP02DG-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, L. Hermanns
Date/Time:	9/11/2014 10:31	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:

Sample Time: 10:31

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☑ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Moana Leirer

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: LF04SP-03
Project Location: ST037 Q1 OU5 Seep
Sample No.: 14ST037Q1-LF04SP03-SW-0
Project Number: 20077.049.0116.5020.03
Sampler(s): H. Nelson
Date/Time: 3/12/2014 1020
Weather: Cloudy 20°-30°

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:
Sample Time: 1022
Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Slight odor / fairly clear

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40 mL	☑ Glass	☐ Plastic	SW8260B
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: LF04SP-03
Project Location:
Sample No.: 14LF04-LF04SP03-SP-0
Project Number:
Sampler(s): ML/JY
Date/Time: 7/10/14
Weather: Cloudy ~55°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seeps
Sample Time: 815
Sample Collection Method: ☒ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40 ml	☒ Glass ☐ Plastic	SW8260 VOCs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	LF04SP-03
Project Location:	JBER-E	Sample No.:	14LF04-LF04SP03-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, L. Hermanns
Date/Time:	9/11/2014 9:26	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other: _____

Sample Time: 9:26

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Moana Leirer

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: LF04SP-04
Project Location: ST037 Q1 OU5 Seeps
Sample No.: 14ST037Q1-LF04SP04-SW-0
Project Number: 20077.049.011e.50720.03
Sampler(s): H. Nelson
Date/Time: 3/12/2014 1045
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1045
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Slight fuel odor / clear

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Project Location:
Project Number:
Date/Time: 7/10/14

Location ID: LF04SP-04
Sample No.: 14LF04-LF04SP04-SP-0
Sampler(s): ML/JY
Weather: Cloudy ~55°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep
Sample Time: 825
Sample Collection Method: ☑ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40 ml	☒ Glass ☐ Plastic	SW8260 VOC's
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	LF04SP-04
Project Location:	JBER-E	Sample No.:	14LF04-LF04SP04-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, L. Hermanns
Date/Time:	9/11/2014 9:20	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other: _____

Sample Time: 9:20

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Moana Leirer

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	LF04SP-04
Project Location:	JBER-E	Sample No.:	14LF04-LF04SP04-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/17/2014 11:20	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other: _____

Sample Time: 11:20

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	LF59MW-02
Project Location:	JBER-E	Sample No.:	14LF059-LF59MW02-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, H. Littlefield
Date/Time:	9/15/2014 8:50	Weather:	50F, Raining

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
8:50	26.57 ft ☑ Meas. ☐ Hist.	15.81 ft Initial	10.76 ft	1.75

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.09

Begin Purge: Time: 08:32 AM

End Purge: Time: 8:47 AM

Total Volume Purged: 1.3

Well Volumes Purged: 0.76

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/15/2014 8:50

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): None Clear

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
12	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

VOCs

Additional Samples: 14LF059-LF59MW02-GW-1, 14LF059-LF59MW02-GW-MS, 14LF059-LF59MW02-GW-MSD

Sampler Signature: Moana Leirer

Date: 9/15/2014 8:50 Well ID: LF59MW-02

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
8:38	15.81	0.40	6.16	0.325	0.38	4.98	215.0	1.99
8:41	15.82	0.60	6.38	0.320	0.23	4.87	215.4	1.67
8:44	15.82	1.10	6.32	0.320	0.20	4.97	205.8	1.94
8:47	15.82	1.30	6.39	0.320	0.17	5.00	196.0	1.90

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	LF59MW-03
Project Location:	JBER-E	Sample No.:	14LF059-LF59MW03-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, H. Littlefield
Date/Time:	9/12/2014 11:00	Weather:	50F, Raining

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
10:25	39.54 ft ☑ Meas. ☐ Hist.	28.66 ft Initial	10.88 ft	1.77 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.07

Begin Purge: Time: 10:35 AM

Total Volume Purged: 1.60

End Purge: Time: 10:59 AM

Well Volumes Purged: 0.90

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/12/2014 11:00

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

VOCs. Black flecks in GW. Turbidity increased with time.

Sampler Signature: Moana Leirer

Date: 9/12/2014 11:00 Well ID: LF59MW-03

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
10:40	28.69	0.25	8.68	0.298	0.62	6.17	32.2	11.6
10:43	28.69	0.50	8.27	0.297	0.51	6.30	15.9	9.92
10:46	28.69	0.75	7.82	0.294	0.41	6.20	19.4	10.9
10:49	28.68	1.00	7.67	0.293	0.27	6.15	21.3	11.1
10:52	28.68	1.20	7.90	0.293	0.23	6.20	15.6	11.5
10:56	28.68	1.50	8.22	0.292	0.21	6.31	9.90	10.7
10:59	28.68	1.60	8.11	0.293	0.21	6.37	7.50	11.8

Notes :

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	LF059-09SEEP-SE
Project Location:	JBER-E	Sample No.:	14LF059-LF05909SEEPSE-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, L. Hermanns
Date/Time:	9/11/2014 14:35:00 PM	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:

Sample Time: 14:35:00 PM

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
12	40mL VOA	☑ Glass	☐ Plastic	SW8260 B VOCS
8	1 L Amber	☑ Glass	☐ Plastic	SW8270 SVOCs
3	500 ml	☐ Glass	☑ Plastic	SW6020 Dissolved Lead
3	500 ml	☐ Glass	☑ Plastic	SW6020 Total Lead
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Collected a duplicate sample and MS/MSD for all analytes

Sampler Signature: Moana Leirer

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU6MW-17
Project Location:	JBER-E	Sample No.:	14SD015-OU6MW17-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, H. Littlefield
Date/Time:	9/12/2014 9:35	Weather:	50F, Rain

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9:35	54.34 ft ☑ Meas. ☐ Hist.	42.12 ft Initial	12.22 ft	1.99

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.10

Begin Purge: Time: 09:07 AM

End Purge: Time: 9:33 AM

Total Volume Purged: 2.50

Well Volumes Purged: 1.26

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/12/2014 9:35

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
4	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
VOCs. Water is orangish.

Sampler Signature: Moana Leirer

Date: 9/12/2014 9:35 Well ID: OU6MW-17

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
9:17	42.29	0.75	5.68	0.695	0.41	5.10	108.3	26.30
9:21	42.32	1.10	6.02	0.695	0.35	5.53	77.0	20.70
9:24	42.32	1.30	6.28	0.694	0.36	5.70	53.0	13.50
9:27	42.32	1.75	6.35	0.695	0.28	5.89	28.1	9.75
9:30	42.35	2.20	6.35	0.696	0.25	5.98	11.4	8.82
9:33	42.39	2.50	6.28	0.696	0.24	6.00	-0.40	7.41

Notes :

Groundwater Sampling Record

Project Name: JBER BA
Well ID: 004MW-08R
Project Location: SD025
Sample No.: 14SD025-004MW08R-GW-0
Project Number: 20072.049.006.4045.02
Sampler(s): H. Nelson
Date/Time: 1100 4/16/2014
Weather: Sunny 30's

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (3/4" = 0.024; 2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
	43.35 ☐ Meas. ☐ Hist.	29.45 Initial	13.9	2.27 (3) 6.80

Water Level Measurement Method: ☒ Electric Tape ☐ Other:
Well Evacuation Method: ☐ Peristaltic Pump ☐ Submersible Pump ☐ Bailer ☐ Other:
Purge Rate: 0.11
Begin Purge: Time: 1120 Total Volume Purged: 5.5
End Purge: Time: 1210 Well Volumes Purged: 2.42
Purge Water Disposed: ☒ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Sample Collection Method & Analysis

Sample Type: ☒ Groundwater ☐ Surface Water ☐ Other:
Sample Time: 1212
Sample Collection Method: ☒ Pump Type: Submersible Dedicated ☐ Y ☐ N ☐ Bailer ☐ Other:
Decon Procedure: ☐ N/A ☒ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
5	1L	☒ Glass ☐ Plastic	AK102/AK103 Short list volume
5	1L	☒ Glass ☐ Plastic	SW8270C SIM Short list volume
9	40mL	☒ Glass ☐ Plastic	AK101
9	40mL	☒ Glass ☐ Plastic	SW8260B BTEX
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
1105 Removed transducer
1255 dropped transducer
Dup 14SD025-004MW08R-GW-1
1 full set

Sampler Signature: Heidi J Nelson

Date: _____ Well ID: _____

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	± 0.2 Temp (°C)	± 3% Cond (µS/cm)	± 10% DO (mg/L)	± 0.1 pH	± 10mV ORP (mV)	± 10% or 1 NTU Color/ Turbidity
11:30	29.52	1.5	3.81	0.572	3.44	6.12	-51.7	36.47
11.35	29.51	2.0	4.52	0.399	2.62	6.45	-58.3	~~3.0~~ #N 30.08
1140	29.52	2.5	5.30	0.413	1.82	6.5	-69.5	37.95
1145	29.52	3.0	5.61	0.426	2.04	6.54	-35.3	22.52 ~~29.53~~
1150	29.51	3.5	4.8	0.433	2.71	6.61	-38.7	12.29
1155	29.52	4.0	4.7	0.439	2.54	6.63	-93.5	13.97
1200	29.52	4.5	5.87	0.441	2.66	6.62	-99.1	8.53
1205	29.51	5.0	6.11	0.442	2.64	6.64	-115.2	8.12
1210	29.52	5.5	6.64	0.447	3.25	6.64	-102.0	5.94

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU4MW-08R
Project Location:	JBER-E	Sample No.:	14SD025-OU4MW08R-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, H. Littlefield
Date/Time:	9/15/2014 11:34	Weather:	50F, Raining

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
10:57	43.25 ft ☑ Meas. ☐ Hist.	29.20 ft Initial	14.05 ft	2.29

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.09

Begin Purge: Time: 11:05 AM

End Purge: Time: 11:31 AM

Total Volume Purged: 2.25

Well Volumes Purged: 1

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/15/2014 11:34

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☐☑ ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B BTEX
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
Orange tint to water. SW8260B BTEX

Sampler Signature: Moana Leirer

Date: 9/15/2014 11:34 Well ID: OU4MW-08R

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
11:15	29.25	0.50	8.01	0.446	0.46	6.03	64.0	44.5
11:19	29.26	0.90	7.85	0.454	0.39	6.16	54.5	29.4
11:22	29.25	1.20	7.57	0.463	0.30	6.18	49.5	19.3
11:25	29.24	1.50	7.56	0.467	0.24	6.14	52.8	15.8
11:28	29.25	1.75	7.71	0.474	0.23	6.24	47.0	13.6
11:31	29.25	2.25	7.72	0.481	0.22	6.30	43.3	9.44

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	IS6-01
Project Location:	JBER-E	Sample No.:	14SD029-IS601-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/16/2014 13:35:00 AM	Weather:	Sunny

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
13:45	60.15 ft ☑ Meas. ☐ Hist.	46.99 ft Initial	13.16 ft	2.15

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 13:48 Total Volume Purged: 3.75

End Purge: Time: 14:38 Well Volumes Purged: 1.74

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/17/2014 14:40

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Moana Leirer

Date: 9/16/2014 0:00 Well ID: IS6-01

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
13:58	47.04	0.75	9.33	0.467	1.70	6.96	90.6	525
14:08	47.00	1.5	10.20	0.465	1.57	7.12	63.9	371
14:17	47.00	2.00	10.66	0.466	1.62	7.34	46.9	126
14:21	47.00	2.25	9.08	0.470	1.69	7.20	68.1	51.3
14:25	47.00	2.75	9.62	0.466	1.53	7.17	71.1	25.3
14:28	47.00	3.00	9.16	0.470	1.65	7.39	61.8	20.4
14:31	47.00	3.25	8.76	0.464	1.62	7.13	75.0	13.8
14:34	47.00	3.50	8.87	0.461	1.56	7.06	73.1	9.95
14:38	47.00	3.75	8.87	0.461	1.51	7.17	60.4	6.72

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	403WL-01
Project Location:	JBER-E	Sample No.:	14ST037-403WL01-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/4/2014 12:30	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11:55	46.35 ft ☑ Meas. ☐ Hist.	39.01 ft Initial	7.34 ft	1.2 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.09

Begin Purge: Time: 12:03 Total Volume Purged: 2.5

End Purge: Time: 12:30 Well Volumes Purged: 2.1

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/4/2014 12:30

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Date: 9/4/2014 12:30 Well ID: 403WL-01

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
12:10	39.02	0.50	7.58	0.692	0.47	6.70	44.5	29.2
12:15	39.02	1.00	7.80	0.681	0.33	6.97	24.0	18.0
12:20	39.02	1.50	7.93	0.675	0.28	7.06	13.2	10.1
12:25	39.02	2.00	7.97	0.670	0.23	7.09	5.60	6.11
12:30	39.02	2.50	7.95	0.666	0.20	7.16	2.00	3.56

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	GW-4A
Project Location:	JBER-E	Sample No.:	14ST037-GW4A-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/5/2014 11:47	Weather:	45F, Rain

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11:21	12.29 ft ☑ Meas. ☐ Hist.	5.29 ft Initial	7.00 ft	1.14

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.60

Begin Purge: Time: 11:26 AM

Total Volume Purged: 1.1

End Purge: Time: 11:45 AM

Well Volumes Purged: 1

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/5/2014 11:47

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Moana Leirer

Date: 9/5/2014 11:47 Well ID: GW-4A

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
11:32	5.40	0.50	7.56	0.439	0.33	6.71	50.9	1.03
11:35	5.38	0.60	7.78	0.441	0.31	6.75	44.7	1.25
11:38	5.37	0.80	7.76	0.443	0.27	6.79	39.8	1.15
11:42	5.36	1.00	7.83	0.444	0.24	6.84	35.4	1.12
11:45	5.37	1.10	7.86	0.444	0.23	6.87	31.5	1.18

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU3MW-02
Project Location:	JBER-E	Sample No.:	14ST037-OU3MW02-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/4/2014 14:21	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
13:45 PM	38.25 ft ☑ Meas. ☐ Hist.	26.13 ft Initial	12.12 ft	1.98

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 13:50 PM

End Purge: Time: 14:20 PM

Total Volume Purged: 2.5

Well Volumes Purged: 1.3

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/4/2014 14:21

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): None Clear

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

SW8260B VOCs. Turbidimeter kept giving error messages on last two readings. Previous result 6.99

Sampler Signature: Jess Young

Date: 9/4/2014 14:21 Well ID: OU3MW-02

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
14:00	26.15	0.50	8.18	0.467	0.45	6.82	67.1	11.4
14:05	26.15	1.00	8.35	0.468	0.39	6.92	59.4	8.74
14:10	26.15	1.75	8.44	0.467	0.43	6.94	59.2	6.99
14:15	26.15	2.25	8.48	0.465	0.47	6.93	58.2	Fault
14:20	26.15	2.50	8.70	0.465	0.48	6.95	55.4	Fault

Notes : Turbidity meter failed for last two readings

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU3MW-11
Project Location:	JBER-E	Sample No.:	14ST037-OU3MW11-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/5/2014 9:58	Weather:	45F, Raining

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9:12	25.30 ft ☑ Meas. ☐ Hist.	10.35 ft Initial	14.95 ft	2.4 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.07

Begin Purge: Time: 09:21 AM

Total Volume Purged: 2.5 gal

End Purge: Time: 9:57 AM

Well Volumes Purged: 1

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/5/2014 9:58

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
Sampled for VOCs.

Sampler Signature: Moana Leirer

Date: 9/5/2014 9:58 Well ID: OU3MW-11

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
9:33	10.42	0.50	7.39	0.78	0.97	6.48	171.0	9.22
9:42	10.40	1.00	7.45	0.729	0.30	6.47	161.0	7.08
9:45	10.52	1.50	7.07	0.730	0.19	6.44	164.4	2.88
9:48	10.43	2.00	7.07	0.730	0.16	6.46	162.9	1.97
9:51	10.42	2.20	7.26	0.730	0.18	6.51	158.8	1.25
9:54	10.40	2.40	7.36	0.730	0.21	6.53	156.4	1.16
9:57	10.39	2.50	7.46	0.730	0.22	6.54	154.8	1.55

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU5MW-06
Project Location:	JBER-E	Sample No.:	14ST037-OU5MW06-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young
Date/Time:	9/8/2014 10:31	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9:40	48.50 ft ☑ Meas. ☐ Hist.	33.79 ft Initial	14.71 ft	2.4 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 09:46 Total Volume Purged: 3.5

End Purge: Time: 10:30 Well Volumes Purged: 1.5

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/8/2014 10:31

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
SW8260B

Sampler Signature: Jess Young

Date: 9/8/2014 10:31 Well ID: OU5MW-06

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
10:00	33.81	0.75	7.97	0.417	4.43	6.85	153.3	31.9
10:05	33.81	1.50	7.91	0.417	4.31	6.88	138.0	9.4
10:10	33.81	2.00	8.16	0.416	4.10	6.89	130.8	4.6
10:15	33.81	2.50	8.35	0.416	4.00	6.92	123.8	3.4
10:20	33.82	2.75	8.43	0.416	4.30	6.93	117.6	2.1
10:25	33.81	3.25	8.46	0.417	4.27	6.93	112.2	1.4
10:30	33.81	3.50	8.61	0.417	4.02	6.93	109.8	1.2

Notes :

Groundwater Sampling Record

Project Name: JBER-E 2014
Well ID: OU5MW-07
Project Location: JBER-E
Sample No.: 14ST037-OU5MW07-GW-0
Project Number: 20077.049.016.5030.03
Sampler(s): J. Young
Date/Time: 9/8/2014 9:16
Weather:

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
8:30	49.39 ft ☑ Meas. ☐ Hist.	31.69 ft Initial	17.7 ft	2.89 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:
Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:
Purge Rate: 0.07
Begin Purge: Time: 08:37 AM
Total Volume Purged: 2.50
End Purge: Time: 9:15 AM
Well Volumes Purged: 0.87
Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:
Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:
Sample Time: 9/8/2014 9:16
Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:
Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Date: 9/8/2014 9:16 Well ID: OU5MW-07

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
8:45	31.69	0.50	6.74	0.371	1.10	5.79	245.2	26.0
8:50	31.69	1.00	7.39	0.354	0.82	6.18	208.0	26.9
8:55	31.69	1.25	7.64	0.352	0.82	6.40	191.1	24.9
9:00	31.69	1.50	7.80	0.351	0.79	6.55	171.7	19.6
9:05	31.69	1.75	7.75	0.351	0.74	6.62	162.4	11.4
9:10	31.69	2.00	7.58	0.350	0.76	6.59	158.3	6.2
9:15	31.69	2.50	7.35	0.350	0.74	6.54	156.7	3.7

Notes :

Groundwater Sampling Record

Project Name: JBER-E 2014
Well ID: OU5MW-08
Project Location: JBER-E
Sample No.: 14ST037-OU5MW08-GW-0
Project Number: 20077.049.016.5030.03
Sampler(s): J. Young
Date/Time: 9/8/2014 11:46
Weather:

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11:15	22.02 ft ☑ Meas. ☐ Hist.	16.31 ft Initial	5.71 ft	0.93

Water Level Measurement Method: ☑ Electric Tape ☐ Other:
Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:
Purge Rate: 0.76
Begin Purge: Time: 11:22 AM
Total Volume Purged: 1.75
End Purge: Time: 11:45 AM
Well Volumes Purged: 1.88
Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:
Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:
Sample Time: 9/8/2014 11:46
Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:
Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): None Clear

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
12	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
SW8260B Collect duplicate and MS/D
Additional Samples: 14ST037-OU5MW08-GW-1, 14ST037-OU5MW08-GW-MS, 14ST037-OU5MW08-GW-MSD

Sampler Signature: Jess Young

Date: 9/8/2014 11:46 Well ID: OU5MW-08

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
11:30	16.31	0.50	9.23	0.300	5.44	6.44	139.0	4.1
11:35	16.31	1.00	9.15	0.300	5.14	6.47	131.2	2.6
11:40	16.31	1.25	9.05	0.299	4.80	6.50	126.6	1.3
11:45	16.31	1.75	8.95	0.299	4.49	6.51	121.7	0.9

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU5MW-15
Project Location:	JBER-E	Sample No.:	14ST037-OU5MW15-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young
Date/Time:	9/8/2014 13:36	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
13:36	14.52 ft ☑ Meas. ☐ Hist.	10.61 ft Initial	3.91 ft	0.64

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.07

Begin Purge: Time: 13:12 PM

End Purge: Time: 13:35 PM

Total Volume Purged: 1.5

Well Volumes Purged: 2.3

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/8/2014 13:36

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
SW8260 B

Sampler Signature: Jess Young

Date: 9/8/2014 13:36 Well ID: OU5MW-15

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
13:20	10.65	0.25	10.54	0.526	0.29	7.16	151.2	8.5
13:25	10.65	0.50	10.46	0.525	0.24	7.14	139.2	5.1
13:30	10.65	1.00	10.46	0.525	0.22	7.17	128.8	5.0
13:35	10.65	1.50	10.44	0.525	0.19	7.17	116.9	3.6

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU5MW-34
Project Location:	JBER-E	Sample No.:	Well was not sampled- see notes below
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/4/2014 0:00	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
8:25	58.35 ☑ Meas. ☐ Hist.	29.51 Initial	28.84	4.70

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☐ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: NA

Begin Purge: Time: NA Total Volume Purged: NA

End Purge: Time: NA Well Volumes Purged: NA

Purge Water Disposed: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Sample Collection Method & Analysis

Sample Type: ☐ Groundwater ☐ Surface Water ☐ Other:

Sample Time: NA

Sample Collection Method: ☐ Pump Type: Dedicated ☐ Y ☐ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:
Well was blocked or damaged at approximately 1.5 feet below TOC. Water level measurements were collected, but the well was unable to be sampled due to the blockage.

Sampler Signature: Jess Young

Date: 9/4/2014 0:00 Well ID: OU5MW-34

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU5MW-38
Project Location:	JBER-E	Sample No.:	14ST037-OU5MW38-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/4/2014 10:11	Weather:	

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
10:11	60.05 ft ☑ Meas. ☐ Hist.	28.50 ft Initial	31.55 ft	5.14 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.1

Begin Purge: Time: 09:20 AM

Total Volume Purged: 5

End Purge: Time: 10:10 AM

Well Volumes Purged: 0.97

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/4/2014 10:11

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): None Clear

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
12	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

SW8260B VOCs

Additional Samples: 14ST037-OU5MW38-GW-1, 14ST037-OU5MW38-GW-MS, 14ST037-OU5MW38-GW-MSD

Sampler Signature: Moana Leirer

Date: 9/4/2014 10:11 Well ID: OU5MW-38

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
9:34	28.51	1.50	7.23	0.065	0.32	4.37	247.0	78.1
9:45	28.54	2.50	7.56	0.265	2.14	5.94	178.7	49.2
9:50	28.54	3.00	7.45	0.448	3.40	6.10	170.0	25.6
9:55	28.54	3.50	7.59	0.519	3.59	6.36	153.7	15.6
10:00	28.54	4.00	7.61	0.530	3.65	6.50	144.7	14.0
10:05	28.54	4.50	7.55	0.534	3.70	6.53	141.6	11.3
10:10	28.54	5.00	7.55	0.535	3.69	6.58	137.4	9.14

Notes :

Groundwater Sampling Record

Project Name: JBER-E 2014
Project Location: JBER-E
Project Number: 20077.049.016.5030.03
Date/Time: 9/8/2014 15:11

Well ID: OU5MW-44
Sample No.: 14ST037-OU5MW44-GW-0
Sampler(s): J. Young
Weather:

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
14:15	41.88 ft ☑ Meas. ☐ Hist.	29.65 ft Initial	12.23 ft	2.00

Water Level Measurement Method: ☑ Electric Tape ☐ Other:
Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:
Purge Rate: 0.09
Begin Purge: Time: 14:24 PM
End Purge: Time: 15:10 PM
Total Volume Purged: 4.00
Well Volumes Purged: 2.00
Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:
Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:
Sample Time: 9/8/2014 15:11
Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:
Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Brown

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Date: 9/8/2014 15:11 Well ID: OU5MW-44

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
14:35	29.66	1.00	10.03	0.416	3.71	7.07	126.2	81.2
14:45	29.65	2.00	10.48	0.415	3.27	7.11	117.5	35.1
14:50	29.66	2.50	10.98	0.415	3.27	7.13	114.4	25.5
14:55	29.66	2.75	11.14	0.415	3.45	7.13	112.7	18.6
15:00	29.66	3.00	11.25	0.413	3.36	7.10	113.6	16.2
15:05	29.66	3.50	11.28	0.413	3.51	7.08	114.1	15.4
15:10	29.66	4.00	10.98	0.414	3.44	7.04	116.0	15.4

Notes :

Groundwater Sampling Record

Project Name: JBER-E 2014
Project Location: JBER-E
Project Number: 20077.049.016.5030.03
Date/Time: 9/4/2014 11:20

Well ID: OU5MW-46
Sample No.: 14ST037-OU5MW46-GW-0
Sampler(s): J. Young, L. Hermanns
Weather:

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
10:40	54.81 ft ☑ Meas. ☐ Hist.	34.09 ft Initial	20.72 ft	3.38

Water Level Measurement Method: ☑ Electric Tape ☐ Other:
Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:
Purge Rate: 0.09
Begin Purge: Time: 10:47
End Purge: Time: 11:20
Total Volume Purged: 3.00
Well Volumes Purged: 0.89
Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:
Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:
Sample Time: 9/4/2014 11:20
Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:
Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): None Clear

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Date: 9/4/2014 11:20 Well ID: OU5MW-46

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
10:55	34.10	0.50	7.46	0.573	0.90	6.45	161.5	28.4
11:00	34.10	1.00	7.96	0.572	0.64	6.66	145.4	28.1
11:05	34.11	1.50	8.09	0.572	0.50	6.79	134.4	27.8
11:10	34.11	2.00	8.25	0.563	0.44	6.81	129.3	27.3
11:15	34.11	2.50	8.28	0.559	0.33	6.85	121.6	24.8
11:20	34.22	3.00	8.26	0.555	0.30	6.84	120.0	20.5

Notes :

Groundwater Sampling Record

Project Name: JBER-E 2014 | Well ID: SP1-02

Project Location: JBER-E | Sample No.: 14ST037-SP102-GW-0

Project Number: 20077.049.016.5030.03 | Sampler(s): J. Young, L. Hermanns

Date/Time: 9/4/2014 13:26 | Weather:

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
12:55 PM	51.56 ft ☑ Meas. ☐ Hist.	33.90 ft Initial	17.66 ft	2.88

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.06

Begin Purge: Time: 12:59 PM | Total Volume Purged: 1.5

End Purge: Time: 13:25 PM | Well Volumes Purged: 0.52

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/4/2014 13:26

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): None Clear

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Date: 9/4/2014 13:26 Well ID: SP1-02

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
13:05	34.10	0.50	7.85	0.484	0.79	6.71	58.2	8.10
13:10	34.09	0.75	8.06	0.487	0.69	6.85	48.6	8.32
13:15	34.11	1.00	8.20	0.491	0.37	6.95	43.5	7.36
13:20	34.07	1.25	8.31	0.495	0.35	6.99	40.8	5.99
13:25	34.07	1.50	8.31	0.497	0.30	7.00	40.2	5.11

Notes :

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	SC-1B
Project Location:	JBER-E	Sample No.:	14ST037-SC1B-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 13:21:00 PM	Weather:	Raining, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:

Sample Time: 13:21

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	SC-08
Project Location:	JBER-E	Sample No.:	14ST037-SC08-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 12:30	Weather:	Raining, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other: _____

Sample Time: 12:30

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: 401WL-03

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 1:15 PM

ADEC Quallified Sampler Name: Lance Lawson

ADEC Quallified Sampler Signature: Lance Lawson

(a) Depth to Water: 33.62 ft. btoc

(b) Total Well Depth: 43.89 ft. btoc

(c) Water Column Interval (a to b): 33.62-43.89 ft. btoc

(d) Water Column Length (b-a): 10.27 ft.

(e) Screen Interval: **26.5 - 41.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 33.62-41.0 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 37.39 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 950

ADEC Quallified Sampler Name: Moana Leiver

ADEC Quallified Sampler Signature: Moana Leiver

Sample I.D. 145T037-401WL03-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: 401WL-03

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1339

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature:

(a) Depth to Water: 33.25 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 43.74 ft. btoc | Deployment Interval: 36-38' ft. btoc

(c) Water Column Interval (a to b): 43.74-33.25 ft. btoc

(d) Water Column Length (b-a): 10.49 ft.

(e) Screen Interval: **26.5 - 41.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 33.25 - 41.0 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1150

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature:

Sample I.D. 145T037-401WL03-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

Yellow/Orange material on PDB.

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: **401WL-04**

Air Force Contractor: **WESTON**

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 13:40

ADEC Quallified Sampler Name: Lance Lawler

ADEC Quallified Sampler Signature:

(a) Depth to Water: 31.70 ft. btoc

(b) Total Well Depth: 42.20 ft. btoc

(c) Water Column Interval (a to b): 31.70-42.40 ft. btoc

(d) Water Column Length (b-a): 10.5 ft.

(e) Screen Interval: **23.8 - 38.8 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 31.70 - 38.8 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 34-36 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 0940

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature:

Sample I.D. 145T037-401WL04-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: **SW8260B VOCs**

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: 401WL-04

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1346

ADEC Qualified Sampler Name: Moana Lerer | ADEC Qualified Sampler Signature:

(a) Depth to Water: 31.36' ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 41.95 ft. btoc | Deployment Interval: ft. btoc

(c) Water Column Interval (a to b): 41.95 - 31.36 ft. btoc

(d) Water Column Length (b-a): 10.59 ft.

(e) Screen Interval: 23.8 - 38.8 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 31.36 - 38.8 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1241

ADEC Qualified Sampler Name: Anne Thompson | ADEC Qualified Sampler Signature:

Sample I.D. 14St037-401WL04-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?): None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1 | Well I.D: 516MW-02

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14 | Time PDBS Deployed: 12:45

ADEC Quallified Sampler Name: Lance Lawsen | ADEC Quallified Sampler Signature: Lance Lawsen

(a) Depth to Water: 37.11 ft. btoc

(b) Total Well Depth: 46.40 ft. btoc

(c) Water Column Interval (a to b): 37.11 - 46.40 ft. btoc

(d) Water Column Length (b-a): 9.29 ft.

(e) Screen Interval: **36.5 - 46.5 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 37.11 - 46.40 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 40-42 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14 | Time Sample Collected: 1050

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature: [signature]

Sample I.D. 145T037-516MW02-GW-0 | Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? — | Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2

Year: 2014

Well I.D: 516MW-02 (ML)

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14

Time PDBS Deployed: 1157

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature: [signature]

(a) Depth to Water: 36.73 ~~36.75~~ (ML) ft. btoc

PDBS Length: 2' ft.

(b) Total Well Depth: 49.22 ~~51.35~~ (ML) ft. btoc

Deployment Interval: 40-42- ft. btoc

(c) Water Column Interval (a to b): 45.22 - 36.73 ft. btoc

(d) Water Column Length (b-a): 8.49 ft.

(e) Screen Interval: 36.5 - 46.5 ~~30.0 - 45.0~~ (ML) ft. btoc

(f) Screened Saturated Interval (portion of c within e): 36.73 - 46.5 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Needs new lock

Sampling Data

Date Sample Collected: 11/12/2014

Time Sample Collected: 1434

ADEC Quallified Sampler Name: Anne Thompson

ADEC Quallified Sampler Signature: Anne Thompson

Sample I.D. 14St087-516MW02-GW-0

Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? _____

Field Duplicate I.D: _____

MS/MSD requested (3 X Volume)? _____

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: NS3-2

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 10:45

ADEC Quallified Sampler Name: Lance Larsen

ADEC Quallified Sampler Signature: Lance Larsen

(a) Depth to Water: 4.88 ft. btoc

(b) Total Well Depth: 26.48 ft. btoc

(c) Water Column Interval (a to b): 4.88 - 26.48 ft. btoc

(d) Water Column Length (b-a): 21.60 ft.

(e) Screen Interval: 4.0 - 24.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 4.88 - 24.0 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 14.0 - 16.0 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

The well has jacked up a couple inches and needs to be cut on & re-surveyed.

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 821

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature: Moana Leirer

Sample I.D. 145T037 - NS32-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

0

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: NS3-2

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1017

ADEC Quallified Sampler Name: Moana Leiver | ADEC Quallified Sampler Signature:

(a) Depth to Water: 4.72 ft. btoc | PDBS Length: 2 ft.

(b) Total Well Depth: 25.80 ft. btoc | Deployment Interval: 12-14' ft. btoc

(c) Water Column Interval (a to b): 25.8 - 4.72 ft. btoc

(d) Water Column Length (b-a): 21.08 ft.

(e) Screen Interval: 3.3 - 23.3 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 4.72 - 23.3 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1406

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature:

Sample I.D. 1457037-NS32-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: **OU5MW-01**

Air Force Contractor: **WESTON**

Deployment Data

Date PDBS Deployed: —

Time PDBS Deployed: —

ADEC Quallified Sampler Name:

ADEC Quallified Sampler Signature:

(a) Depth to Water: none ft. btoc

(b) Total Well Depth: 35.70 ft. btoc

(c) Water Column Interval (a to b): ft. btoc

(d) Water Column Length (b-a): ft.

(e) Screen Interval: **30.0 - 45.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): ft. btoc

PDBS Length: ft.

Deployment Interval: ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

well is dry or has an obstruction. Because the bottom was found 10-feet above the depth the bottom of screen is supposed to be, it is likely an obstruction.

Sampling Data

Date Sample Collected:

Time Sample Collected:

ADEC Quallified Sampler Name:

ADEC Quallified Sampler Signature:

Sample I.D.

Number Days PDBS was deployed: days

Analysis Requested: **SW8260B VOCs**

Field duplicate Collected (2X Volume)?

Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-05

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1420

ADEC Quallified Sampler Name: Moana Leiver | ADEC Quallified Sampler Signature: [signature]

(a) Depth to Water: 22.07 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 37.61 ft. btoc | Deployment Interval: 27'-29' ft. btoc

(c) Water Column Interval (a to b): 37.61 - 22.07 ft. btoc

(d) Water Column Length (b-a): 15.54 ft.

(e) Screen Interval: **18.0 - 33.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 22.07 - 33.0 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Well needs cut down or shorter cap.

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1310

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature: [signature]

Sample I.D.: 145t037-005MW05-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None.

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1 | Well I.D: OU5MW-09

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14 | Time PDBS Deployed: 11:10

ADEC Quallified Sampler Name: Lance Larsen | ADEC Quallified Sampler Signature: Lance Larsen

(a) Depth to Water: 3.95 ft. btoc | PDBS Length: 2 ft.

(b) Total Well Depth: 10.17 ft. btoc | Deployment Interval: 5-7 ft. btoc

(c) Water Column Interval (a to b): 3.95 - 10.17 ft. btoc

(d) Water Column Length (b-a): 6.22 ft.

(e) Screen Interval: 3.0 - 8.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 3.95 - 8 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

The well has frost jacked a couple inches. It needs to be cut and re-surveyed.

Sampling Data

Date Sample Collected: 7/9/14 | Time Sample Collected: 852

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature: Moana Leirer

Sample I.D. 145T037-OU5MW09-GW-0 | Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? — | Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PDB bag was not properly secured. The lid popped off when we pulled the bag up and the bag was not completely full. It doesn't look like groundwater could entered into the PDB from the top/lid. It appears the lid popped off while extracting the PDB from the well

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-09

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1410

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature: [signature]

(a) Depth to Water: 3.87 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 9.59 ft. btoc | Deployment Interval: 6.5' - 8.5' ft. btoc

(c) Water Column Interval (a to b): 9.59 - 3.87 ft. btoc

(d) Water Column Length (b-a): 5.72 ft.

(e) Screen Interval: **6.0 - 11.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 6.0 - 9.59 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Bottom of well feels hard & not soft like sediment.

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1418

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature: Anne Thompson

Sample I.D. 14ST037-OU5MW09-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: OU5MW-10

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 11:34

ADEC Quallified Sampler Name: Lance Larsen

ADEC Quallified Sampler Signature: Lance Larsen

(a) Depth to Water: ~4 - inches ft. btoc

(b) Total Well Depth: 4.80 ft. btoc

(c) Water Column Interval (a to b): 0.33 - 4.80 ft. btoc

(d) Water Column Length (b-a): 4.5 ft.

(e) Screen Interval: 3.0 - 8.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 3 - 4.8 ft. btoc

PDBS Length: 1 ft.

Deployment Interval: 3.5 - 4.5 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

The Screen interval is in question.

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 900

ADEC Quallified Sampler Name: Moana Leiver

ADEC Quallified Sampler Signature: Moana Leiver

Sample I.D. 145T037-OU5MW10-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-10

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 ~~10/23/2014~~ | Time PDBS Deployed:

ADEC Qualified Sampler Name: Moana Leirer | ADEC Qualified Sampler Signature:

(a) Depth to Water:	0.63 ft. btoc	0.6	PDBS Length: 1 ft.
(b) Total Well Depth:	4.62 ft. btoc	4.8	Deployment Interval: 3-4 ft. btoc
(c) Water Column Interval (a to b):	ft. btoc	0.6-4.8	
(d) Water Column Length (b-a):	ft.	4.2	
(e) Screen Interval:	3.0 - 8.0 ft. btoc		
(f) Screened Saturated Interval (portion of c within e):	~~0.6-4.8~~ 3-4.8 ft. btoc		

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

NEED 1' PDB -

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 904

ADEC Qualified Sampler Name: Anne Thompson | ADEC Qualified Sampler Signature:

Sample I.D. 145T057-OU5MW10-GW-0 | Number Days PDBS was deployed: 20 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

Could only collect 2 VOAs, not enough water for the 3rd.

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: OU5MW-11

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-20-14

Time PDBS Deployed: 11:20

ADEC Quallified Sampler Name: Lance Larsen

ADEC Quallified Sampler Signature: [signature]

(a) Depth to Water: 37.18 ft. btoc

(b) Total Well Depth: 51.94 ft. btoc

(c) Water Column Interval (a to b): 37.18-51.94 ft. btoc

(d) Water Column Length (b-a): 14.76 ft.

(e) Screen Interval: 30.0 - 45.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 37.18-45 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 40-42 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 1035

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature: [signature]

Sample I.D. 14ST037-OU5MW11-GW-0

Number Days PDBS was deployed: ~~21~~ (MU) 19 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

MS/MSD requested (3 X Volume)? —

Field Duplicate I.D: N/A

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2

Year: 2014

Well I.D: 05MW-11 ~~51GMW-02~~

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14

Time PDBS Deployed: 1128

ADEC Qualified Sampler Name: Moana Leira

ADEC Qualified Sampler Signature:

(a) Depth to Water: 36.75 ft. btoc

(b) Total Well Depth: 51.34 ft. btoc

(c) Water Column Interval (a to b): 14.59 ft. btoc

(d) Water Column Length (b-a): ↳ ft.

(e) Screen Interval: 30.0 - ~~46.5~~ 45.0 ~~36.5 - 46.5~~ ft. btoc

(f) Screened Saturated Interval (portion of c within e): 36.75 - 46.5 ft. btoc

PDBS Length: 2' ft.

Deployment Interval: 40-42' ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014

Time Sample Collected: 1255

ADEC Qualified Sampler Name: Anne Thompson

ADEC Qualified Sampler Signature:

Sample I.D. 1451037-005MW11-GW-0

Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)?

Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: OU5MW-12

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 5:47 pm

ADEC Quallified Sampler Name: Lance Lawson

ADEC Quallified Sampler Signature: Lance Lawson

(a) Depth to Water: 6.00 ft. btoc

(b) Total Well Depth: 11.55 ft. btoc

(c) Water Column Interval (a to b): 6.00 - 11.55 ft. btoc

(d) Water Column Length (b-a): 5.55 ft.

(e) Screen Interval: 5.0 - 10.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 6.00 - 10 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 7-9 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 933

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature:

Sample I.D. 145T037-OU5MW12-GW-0

Number Days PDBS was deployed: days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? X YES

Field Duplicate I.D: 145T037-OU5MW12-GW-1

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

Collected duplicate sample

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-12

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 939

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature: [signature]

(a) Depth to Water: 6.84 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 11.55 ft. btoc | Deployment Interval: 7-9' ft. btoc

(c) Water Column Interval (a to b): ft. btoc

(d) Water Column Length (b-a): 4.71 ft.

(e) Screen Interval: 5.0 - 10.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 6.85 - 10 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 6955

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature: [signature]

Sample I.D. 145T037-OU5MW12-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?): None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: OU5MW-13

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 4:45 pm

ADEC Quallified Sampler Name: Lance Larsen

ADEC Quallified Sampler Signature: Lance Larsen

(a) Depth to Water: 4.40 ft. btoc

(b) Total Well Depth: 9.41 ft. btoc

(c) Water Column Interval (a to b): 4.40-9.41 ft. btoc

(d) Water Column Length (b-a): 5.01 ft.

(e) Screen Interval: 2.5 - 9.5 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 4.40-9.41 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 7-9 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

The casing is front jacked up @ an inch. It needs to be cut and re-shrouded.

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 925

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature: Moana Leirer

Sample I.D. 14STO37-OU5MW13-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? yes

Sample Collection Notes (any biofouling or staining on the PDBS?):

Collected MS/MSD

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-13

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 930

ADEC Qualified Sampler Name: Moana Leiver | ADEC Qualified Sampler Signature: [signature]

(a) Depth to Water: 4.29 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 8.94 ft. btoc | Deployment Interval: 6 - 8 ft. btoc

(c) Water Column Interval (a to b): 8.94 - 4.29 ft. btoc

(d) Water Column Length (b-a): 4.65 ft.

(e) Screen Interval: 2.5 - 9.5 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 4.65 - 9.5 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated Interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Lock is super rusty. Replace lock when sampling

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 0940

ADEC Qualified Sampler Name: Anne Thompson | ADEC Qualified Sampler Signature: [signature]

Sample I.D. 145t037-DU5MW13-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? Yes | Field Duplicate I.D: 145t037-DU5MW13-GW-1

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

Needs new lock.

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1 | Well I.D: OU5MW-14

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-20-14 | Time PDBS Deployed: 11:50

ADEC Quallified Sampler Name: Lance Lawsen | ADEC Quallified Sampler Signature: Lance Lawsen

(a) Depth to Water: 10.37 ft. btoc

(b) Total Well Depth: 14.70 ft. btoc

(c) Water Column Interval (a to b): 10.37 - 14.70 ft. btoc

(d) Water Column Length (b-a): 4.33 ft.

(e) Screen Interval: **7.0 - 12.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 10.37 - 12 ft. btoc

PDBS Length: 1 ft.

Deployment Interval: 11 - 12 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14 | Time Sample Collected: 915

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature: Moana Leirer

Sample I.D. 145T037-OU5MW14-GW-0 | Number Days PDBS was deployed: 21 days

Analysis Requested: **SW8260B VOCs**

Field duplicate Collected (2X Volume)? — | Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

Well is in good shape. Well located on the west side of the "Timberline" Building

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-14

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 920

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature:

(a) Depth to Water: 10.24 ft. btoc | PDBS Length: 1 ft.

(b) Total Well Depth: 14.43 ft. btoc | Deployment Interval: 11-12 ft. btoc

(c) Water Column Interval (a to b): 10.24-14.43 ft. btoc

(d) Water Column Length (b-a): 4.19 ft.

(e) Screen Interval: 7.0 - 12.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 10.24-12 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Well is in good condition

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 0925

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature:

Sample I.D. 14S1037-OU5MW14-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?): None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1 | Well I.D: OU5MW-31

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14 | Time PDBS Deployed: 10:25

ADEC Quallified Sampler Name: Lance Larsen | ADEC Quallified Sampler Signature: Lance Larsen

(a) Depth to Water: 4.48 ft. btoc | PDBS Length: 2 ft.

(b) Total Well Depth: 9.58 ft. btoc | Deployment Interval: 5.0-7.0 ft. btoc

(c) Water Column Interval (a to b): 4.48-9.58 ft. btoc

(d) Water Column Length (b-a): 5.10 ft.

(e) Screen Interval: **2.5 - 7.5 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 4.48-7.5 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14 | Time Sample Collected: 0815

ADEC Quallified Sampler Name: Moana Leiver/Jessy Young | ADEC Quallified Sampler Signature:

Sample I.D. 145T037-OU5MW31-GW-0 | Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? ~

MS/MSD requested (3 X Volume)?

Field Duplicate I.D: ~~DUP~~ MC

145T037-OU5MW31-GW-1

Sample Collection Notes (any biofouling or staining on the PDBS?):

Duplicate sample collected here.

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-31

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1007

ADEC Qualified Sampler Name: Moana Leirer | ADEC Qualified Sampler Signature:

(a) Depth to Water: 4.62 ft. btoc | PDBS Length: ~~5~~ 2' ft.

(b) Total Well Depth: 9.56 ft. btoc | Deployment Interval: 5-7' ft. btoc

(c) Water Column Interval (a to b): 9.56 - 4.62 ft. btoc

(d) Water Column Length (b-a): 4.94 ft.

(e) Screen Interval: 2.5 - 7.5 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 4.94 - 7.5 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2013 | Time Sample Collected: 1355

ADEC Qualified Sampler Name: Anne Thompson | ADEC Qualified Sampler Signature:

Sample I.D. 145t087-005mw31-gw-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: OU5MW-33

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6/18/14

Time PDBS Deployed: 0950

ADEC Quallified Sampler Name: Lance Larsen

ADEC Quallified Sampler Signature: Lance La

(a) Depth to Water: 12.78 ft. btoc

(b) Total Well Depth: 23.13 ft. btoc

(c) Water Column Interval (a to b): 12.78 - 23.13 ft. btoc

(d) Water Column Length (b-a): 10.35 ft.

(e) Screen Interval: 9.1 - 19.1 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 12.78 - 19.1 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 15 - 17 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

well in good shape.

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 840

ADEC Quallified Sampler Name: Moana Leiver

ADEC Quallified Sampler Signature: MLeiver

Sample I.D. 14S1037-OU5MW33-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

Roadway to well is blocked by several fallen trees on the road.
Must hike in w/ bear spray/airhorn

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-33

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 957

ADEC Qualified Sampler Name: Moana Leiver | ADEC Qualified Sampler Signature:

(a) Depth to Water: 13.80 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 22.82 ft. btoc | Deployment Interval: 15 - 17' ft. btoc

(c) Water Column Interval (a to b): 22.82 - 13.80 ft. btoc

(d) Water Column Length (b-a): 9.0 ft.

(e) Screen Interval: 9.1 - 19.1 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 13.8 - 19.1 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1339

ADEC Qualified Sampler Name: Anne Thompson | ADEC Qualified Sampler Signature: Anne Thompson

Sample I.D. 1451057-005MW33-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?): None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: OU5MW-45

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-20-14

Time PDBS Deployed: 10:40

ADEC Qualified Sampler Name: Lance Larsen

ADEC Qualified Sampler Signature: Lance Larsen

(a) Depth to Water: 31.35 ft. btoc

(b) Total Well Depth: 39.38 ft. btoc

(c) Water Column Interval (a to b): 31.35 - 39.38 ft. btoc

(d) Water Column Length (b-a): 8.03 ft.

(e) Screen Interval: 24.5 - 39.5 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 31.35 - 39.38 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 35 - 37 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/29/14

Time Sample Collected: 1024

ADEC Qualified Sampler Name: Moana Lerer

ADEC Qualified Sampler Signature:

Sample I.D. 1451037-OU5MW45-GW-0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-45

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 1308

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature:

(a) Depth to Water: 30.99 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 39.14 ft. btoc | Deployment Interval: 34 - 36 ft. btoc

(c) Water Column Interval (a to b): 39.14 - 30.99 ft. btoc

(d) Water Column Length (b-a): 8.2' ft.

(e) Screen Interval: 24.5 - 39.5 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 30.99 - 39.5 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1115

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature:

Sample I.D. 1454037-OU5MW45-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

1454037-OU5MW-GW-1

Field duplicate Collected (2X Volume)? X | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?): None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: OU5MW-46

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: ~~10/14/15~~ ~~10/28/2014~~ 10/28/2014 | Time PDBS Deployed: 1223

ADEC Quallified Sampler Name: ~~Meaghan Weaver~~ Anne Thompson | ADEC Quallified Sampler Signature:

(a) Depth to Water: 33.76 ft. btoc | PDBS Length: 2 ft.

(b) Total Well Depth: 54.00 ft. btoc | Deployment Interval: 49-51 ft. btoc

(c) Water Column Interval (a to b): 33.76 - 54.00 ft. btoc

(d) Water Column Length (b-a): ft.

(e) Screen Interval: 44.0 - 55.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 44 - 54 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

~~Need to get a PDB rope w/ weight~~

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1055

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature:

Sample I.D. 14S1037-OU5MW46-GW-0 | Number Days PDBS was deployed: 15 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?): None.

WNK

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1

Year: 2014

Well I.D: SP2/6-05

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14

Time PDBS Deployed: 2:05 pm

ADEC Qualified Sampler Name: Lance Larsen

ADEC Qualified Sampler Signature: Lance Larsen

(a) Depth to Water: 31.22 ft. btoc

(b) Total Well Depth: 49.20 ft. btoc

(c) Water Column Interval (a to b): 31.22 - 49.20 ft. btoc

(d) Water Column Length (b-a): 9.98 ft.

(e) Screen Interval: ~~31.22~~ 26.0 - 46.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 31.22 - 46.0 ft. btoc

PDBS Length: 2 ft.

Deployment Interval: 38-40 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14

Time Sample Collected: 1000

ADEC Qualified Sampler Name: Moana Leirer

ADEC Qualified Sampler Signature:

Sample I.D. 14ST037 - ~~SP2/6-05~~ SP2605 (MD) - GW - 0

Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? —

Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2

Year: 2014

Well I.D: SP2/6-05

Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14

Time PDBS Deployed: 1331

ADEC Quallified Sampler Name: Moana Leirer

ADEC Quallified Sampler Signature: Moana Leirer

(a) Depth to Water: 30.84 ft. btoc

(b) Total Well Depth: 49.02 ft. btoc

(c) Water Column Interval (a to b): 42.02 - 30.84 ft. btoc

(d) Water Column Length (b-a): 11.18 ft.

(e) Screen Interval: **26.0 - 46.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 30.84 - 46.0 ft. btoc

PDBS Length: 2' ft.

Deployment Interval: 38 - 40' ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014

Time Sample Collected: 10:20

ADEC Quallified Sampler Name: Anne Thompson

ADEC Quallified Sampler Signature:

Sample I.D. 145t037-SP2605-GW-0

Number Days PDBS was deployed: 28 days

Analysis Requested: **SW8260B VOCs**

Field duplicate Collected (2X Volume)?

Field Duplicate I.D:

MS/MSD requested (3 X Volume)? Yes

Sample Collection Notes (any biofouling or staining on the PDBS?): None

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 1 | Well I.D: SP4/11-03

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 6-18-14 | Time PDBS Deployed: 3:05 pm

ADEC Quallified Sampler Name: Lance Lawsen | ADEC Quallified Sampler Signature: [signature]

(a) Depth to Water: 36.73 ft. btoc | PDBS Length: 2 ft.

(b) Total Well Depth: 54.30 ft. btoc | Deployment Interval: 45-47 ft. btoc

(c) Water Column Interval (a to b): 36.73 - 54.30 ft. btoc

(d) Water Column Length (b-a): 17.57 ft.

(e) Screen Interval: **35.0 - 55.0 ft. btoc**

(f) Screened Saturated Interval (portion of c within e): 36.73 - 54.3 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 7/9/14 | Time Sample Collected: 1115

ADEC Quallified Sampler Name: Moana Leirer | ADEC Quallified Sampler Signature: [signature]

Sample I.D. 145T037-SP41103-GW-0 | Number Days PDBS was deployed: 21 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? — | Field Duplicate I.D: N/A

MS/MSD requested (3 X Volume)? —

Sample Collection Notes (any biofouling or staining on the PDBS?):

PASSIVE DIFFUSION BAG SAMPLER (PDBS) DATA SHEET

JBER-Elmendorf OU 5 Early Warning/Sentry Well Network

Semiannual Sampling Event #: 2 | Well I.D: SP4/11-03

Year: 2014 | Air Force Contractor: WESTON

Deployment Data

Date PDBS Deployed: 10/15/14 | Time PDBS Deployed: 14 45

ADEC Quallified Sampler Name: Moana Lehrer | ADEC Quallified Sampler Signature:

(a) Depth to Water: 36.59 ft. btoc | PDBS Length: 2' ft.

(b) Total Well Depth: 54.11 ft. btoc | Deployment Interval: 44'-46' ft. btoc

(c) Water Column Interval (a to b): 54.11-36.59 ft. btoc

(d) Water Column Length (b-a): 17.52 ft.

(e) Screen Interval: 35.0 - 55.0 ft. btoc

(f) Screened Saturated Interval (portion of c within e): 36.59 - 55 ft. btoc

*If enough water, Place PDBS into the middle of the screened saturated interval.

** At a minimum, ensure entire PDBS is within the screened saturated interval.

Red = field measured entry.

Blue = calculated entry based on field measurements

Deployment Notes and Well Integrity (condition of casing, flush mount sealing properly, cement seal intact etc:) :

Sampling Data

Date Sample Collected: 11/12/2014 | Time Sample Collected: 1501

ADEC Quallified Sampler Name: Anne Thompson | ADEC Quallified Sampler Signature:

Sample I.D.: 145T037-SP4/11-03-GW-0 | Number Days PDBS was deployed: 28 days

Analysis Requested: SW8260B VOCs

Field duplicate Collected (2X Volume)? | Field Duplicate I.D:

MS/MSD requested (3 X Volume)?

Sample Collection Notes (any biofouling or staining on the PDBS?):

None

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: OUSSP-01
Project Location: ST037 01 OUS SEEPS
Sample No.: 14ST037Q1-OUSSP01-SW-0
Project Number: 20077.049.016.5020.03
Sampler(s): H. Nelson
Date/Time: 3-10-2014 1428
Weather: 20-30° Cloudy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1430
Sample Collection Method: ☐ Grab ☒ Bailer (3/4") ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Clear / odorless

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi Nelson

Surface Water Sampling Record

Project Name: LTM
Project Location:
Project Number:
Date/Time: 7/8/14 1120

Location ID: OU5 SP-01
Sample No.: 145T037Q2-OU5SP01-SP-0
Sampler(s): ML/JY
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep
Sample Time: 1140
Sample Collection Method: ☒ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 Liter	☒ Glass ☐ Plastic	SW8270 PAHs
3	40 ml	☒ Glass ☐ Plastic	SW8260 VOCs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-01
Project Location:	JBER-E	Sample No.:	14ST037-OU5SP01-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 10:57	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 10:57

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-01
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5SP01-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 12:10	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 12:10

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER ITL
Location ID: OUSSP-02
Project Location: ST037 01 OUS Seeps
Sample No.: 14ST037D1-OUSSP02-2014
Project Number: 20077.049.0116.5070.03
Sampler(s): H. Nelson
Date/Time: 3-10-2014 1445
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: _____

Sample Collection Method: ☐ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☐ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: Unable to sample, frozen, attempted to clear but was frozen solid.

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: OU5 SP-02
Project Location:
Sample No.: ~~HEEM-~~ 145T037Q2-OU5SP02-SW-0
Project Number:
Sampler(s): ML/JY
Date/Time: 7/8/14 1120
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep
Sample Time: 1130
Sample Collection Method: ☒ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
-	-	-	-	-	-	

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1L	☒ Glass ☐ Plastic	SW 8270 PAH's
3	40mL	☒ Glass ☐ Plastic	SW 8260 VOC's
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-02
Project Location:	JBER-E	Sample No.:	14ST037-OU5SP02-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 10:55	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 10:55

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-02
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5SP02-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 11:58	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 11:58

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: OUSSP-07
Project Location: ST037 Q1 OUS Seeps
Sample No.: 14ST037Q1-OUSSP07-SW-0
Project Number: 20077.049.0116.5020.03
Sampler(s): H. Nelson
Date/Time: 3-10-2014 - 1120
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:
Sample Time: 1129
Sample Collection Method: ☐ Grab ☑ Bailer ☐ Other:
Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Red in Color / Odorless

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☑ Glass ☐ Plastic	SW8260B
2	1L	☑ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi J. Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Project Location:
Project Number:
Date/Time: 7/8/14 1021

Location ID: OU5SP-07
Sample No.: 145T037@2-OU5SP07-SP-0
Sampler(s): ML/JY
Weather: Sunny ~65°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☑ Other: Seeps
Sample Time: 1030
Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 Liter	☒ Glass ☐ Plastic	SW8270 PAHs
3	40ml VOA	☒ Glass ☐ Plastic	SW8260 VOCs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-07
Project Location:	JBER-E	Sample No.:	14ST037-OU5SP07-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 09:47	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 09:47

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: MS/D collected for SW8270D SIM only.

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-07
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5SP07-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 11:22	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 11:22

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM Location ID: OU5SP-10

Project Location: ST037 Q1 OU5 Seeps Sample No.: 14ST037Q1-OU5SP10-SW-0

Project Number: 20077.049.0110.5020.03 Sampler(s): H. Nelson

Date/Time: 3/10/2014 / 10:07 Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: _____

Sample Collection Method: ☐ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☐ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: Frozen @ ~10" above ground in PVC, unable to break through & unable to sample

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

146T037Q2-OU5SP10-SP-0

Project Name: IBER
Project Location:
Project Number:
Date/Time: 7/8/14 0930

Location ID: OU5SP-10
Sample No.: ~~146T037-OU5SP10-146T037-005-ML~~
Sampler(s): JV/ML
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep
Sample Time: 935
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Turbid / brown

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 Liter	☒ Glass ☐ Plastic	SW8270 PAHs
3	40mL VOA	☒ Glass ☐ Plastic	SW8260 VOCs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-10
Project Location:	JBER-E	Sample No.:	14ST037-OU5SP10-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 08:39	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 08:39

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-10
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5SP010-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 10:42	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 10:42

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: 005SP-11
Project Location: ST037 01 005 Slope
Sample No.: 14ST03701-005SP11-SW-0
Project Number: 20077.049.016.5026.03
Sampler(s): H. Nelson
Date/Time: 3-10-2014 0954
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1001
Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: frozen - was able to break through and sample

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER
Project Location:
Project Number:
Date/Time: 7/8/14 9:20
Location ID: OU5SP-11
Sample No.: 145T037Q2-OU5SP11-SP-0
Sampler(s): ML/JH
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep
Sample Time: 930
Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 L	☒ Glass ☐ Plastic	SW8270 PAH's
3	40mL VOA	☒ Glass ☐ Plastic	SW8260 VOC's
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: Surface water puddled around PVC

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-11
Project Location:	JBER-E	Sample No.:	14ST037-OU5SP11-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 08:32	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 08:32

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5SP-11
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5SP11-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 10:31	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 10:31

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: WESW02
Project Location: ST037-01 DO5 Seeps
Sample No.: W/ST037Q1-WESW02-SW-0
Project Number: 20077.049.0116.5020.03
Sampler(s): H. Nelson
Date/Time: 3/10/2014 1043
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:
Sample Time: 1045
Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear / sulfur odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
9	40mL	☑ Glass ☐ Plastic	SW8260B
6	1L	☑ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: MS/D

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Project Location:
Project Number:
Date/Time: 7/28/14 1000

Location ID: WCSW-02 (DUP)
Sample No.: 14ST037Q2-WCSW02-SW-0 / -1
Sampler(s): ML/JY
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☒ Other: ML SEER
Sample Time: 1008
Sample Collection Method: ☒ Grab ☒ Bailer ☐ Other: DNA
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
X 4	1 Liter	☒ Glass ☐ Plastic	SW8270 PAH
X 6	40ml VOA	☒ Glass ☐ Plastic	SW8260 VOCs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Collected Duplicate sample (14ST037Q2-WCSW02-SW-1)

Sampler Signature: Jana

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	WCSW-02
Project Location:	JBER-E	Sample No.:	14ST037-WCSW02-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 09:10	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:

Sample Time: 09:10

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	WCSW-02
Project Location:	JBER-E	Sample No.:	14ST037-Q4-WCSW02-SW-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 11:02	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 11:02

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: WLSW-03
Project Location: STO37 Q1 OU5 SEEP
Sample No.: 14ST0371-WLSW03-SW-0
Project Number: 20077.049.0116.5070.03
Sampler(s): H. Nelson
Date/Time: 3/10/2014 1015
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1017
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear w/ strong odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: WCSW-03
Project Location:
Sample No.: 145T037Q2-WCSW03-SW-0
Project Number:
Sampler(s): ML/JY
Date/Time: 7/8/14 0935
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☒ Other: ~~Scoops~~ ML
Sample Time: 952
Sample Collection Method: ☒ Grab ☒ Bailer ☐ Other: GRAB SAMPLE
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 liter	☒ Glass ☐ Plastic	SW8270 PAHs
3	40 ml VOA	☒ Glass ☐ Plastic	SW8260 VOC's
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	WCSW-03
Project Location:	JBER-E	Sample No.:	14ST037-WCSW03-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 08:51	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:

Sample Time: 08:51

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	WCSW-03
Project Location:	JBER-E	Sample No.:	14ST037-Q4-WCSW03-SW-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 10:51	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 10:51

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: SBER CTM
Location ID: WCSW-04
Project Location: ST037 Q1 DDS Seeps
Sample No.: 14ST037Q1-WCSWX04-SW-0
Project Number: 20077.049.011e.5020.03
Sampler(s): H. Nelson
Date/Time: 3/10/2014 1105
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:
Sample Time: 1107
Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): Clear, slight odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☑ Glass ☐ Plastic	SW8260B
2	1L	☑ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: WCSW-034
Project Location:
Sample No.: 145037-Q2-WCSW04-SW-0
Project Number:
Sampler(s): ML/JY
Date/Time: 7/8/14 1010
Weather: Sunny ~60°F

Sample Collection Method & Analysis

Sample Type: [X] Surface Water [ ] Other:
Sample Time: 1015
Sample Collection Method: [X] Grab [ ] Bailer [ ] Other:
Decon Procedure: [X] N/A [ ] Alconox Wash [ ] Tap Rinse [ ] DI Water [ ] Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
-	-	-	-	-	-	-

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 Liter	[X] Glass [ ] Plastic	SW8270
3	40mL	[X] Glass [ ] Plastic	SW8260
		[ ] Glass [ ] Plastic	
		[ ] Glass [ ] Plastic	
		[ ] Glass [ ] Plastic	
		[ ] Glass [ ] Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	WCSW-04
Project Location:	JBER-E	Sample No.:	14ST037-WCSW04-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 09:18	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:

Sample Time: 09:18

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	WCSW-04
Project Location:	JBER-E	Sample No.:	14ST037-Q4-WCSW04-SW-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 11:10	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 11:10

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: BPSW-01
Project Location: ST037 1st Q 005 Steps
Sample No.: 14ST037Q1-BPSW01-SW-0
Project Number: 20077.049.011e.5020.03
Sampler(s): H. Nelson
Date/Time: 3/10/2014 1520
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1523
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear / slight odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboretory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: Dup 14ST037Q1-BPSW01-SW-1

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-01
Project Location:	JBER-E	Sample No.:	14ST037-BPSW01-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 11:56	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 11:56

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: MS/D and duplicate samples taken.
Duplicate sample ID: 14ST037-BPSW01-SW-1

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-01
Project Location:	JBER-E	Sample No.:	14ST037-Q4-BPSW01-SW-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 12:55	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 12:55

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: MS/D and duplicate samples taken.
Duplicate sample ID #: 14ST037-Q4-BPSW01-SW-1

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: BPSW-03
Project Location: ST037 Q1 OUS Sump
Sample No.: 14ST037Q1-BPSW03-SW-0
Project Number: 20077.049.011.5020.03
Sampler(s): H. Nelson
Date/Time: 3/12/2014 0920
Weather: Cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:
Sample Time: 0930
Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear / slight odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☑ Glass ☐ Plastic	SW8260B
2	1L	☑ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER LTM	Location ID:	BPSW-03
Project Location:		Sample No.:	145T037Q2-BPSW-03-SW-0
Project Number:		Sampler(s):	ML/JY
Date/Time:	7/8/14	Weather:	Partly Cloudy ~65°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:

Sample Time: 1450

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
–	–	–	–	–	–	–

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
12	1 Liter	☒ Glass ☐ Plastic	SW8270 PAHs
3	40ml	☒ Glass ☐ Plastic	SW8260 VOC's
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-03
Project Location:	JBER-E	Sample No.:	14ST037-BPSW03-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 12:47	Weather:	45F, Rainiy

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other: _____

Sample Time: 12:47

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☐ Glass ☐ Plastic	SW8260 B VOCS
2	1L Amber	☑ Glass ☐ Plastic	SW8270D SIMS PAHs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: _____

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: BPSW-04
Project Location: ST037 Q1 DDS Seeps
Sample No.: 14ST037Q1-BPSW04-SW-0
Project Number: 20077.049.0116.5020.03
Sampler(s): H. Nelson
Date/Time: 3/11/2014 0920
Weather: cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 0925
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear / slight odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi J. Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: BPSW-04
Project Location:
Sample No.: 14ST037Q2-BPSW04-GW-0
Project Number:
Sampler(s): ML/JY
Date/Time: 7/8/14
Weather: Partly Cloudy ~65°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1400
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
—	—	—	—	—	—	—

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 Liter	☒ Glass ☐ Plastic	SW8270 PAH's
3	40 ml	☐ Glass ☐ Plastic	SW 8260 VOC's
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-04
Project Location:	JBER-E	Sample No.:	14ST037-BPSW04-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 12:08	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 12:08

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-04
Project Location:	JBER-E	Sample No.:	14ST037-Q4-BPSW04-SW-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 14:09	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 14:09

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: BPSW05
Project Location: ST037 OU1 OU5 Seeps
Sample No.: 14ST037OU1-BPSW05-SW-0
Project Number: 20077.049.0116.5070.03
Sampler(s): H. Nelson
Date/Time: 3/11/2014 0930
Weather: cloudy 20-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 0937
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear / slight odor

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi L Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: BPSW-05
Project Location:
Sample No.: 145T037-Q2-BPSW05-SW-0
Project Number:
Sampler(s): ML/JY
Date/Time: 7/8/14
Weather: Partly Cloudy ~65°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1410
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 Liter	☒ Glass ☐ Plastic	1 SW8270 PAH's
3	40ml VOA	☒ Glass ☐ Plastic	SW8260 VOCs
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-05
Project Location:	JBER-E	Sample No.:	14ST037-BPSW05-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 12:11	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 12:11

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	BPSW-05
Project Location:	JBER-E	Sample No.:	14ST037-Q4-BPSW05-SW-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 14:20	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other: _____

Sample Time: 14:20

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other: _____

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other: _____

Sample Description (color, turbidity, odor, sheen, etc.): _____

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: 005CP-01
Project Location: ST037 Q1 005 Seeps
Sample No.: 145t037Q1-005CP01-SW-0
Project Number: 20077.049.0116.5020.03
Sampler(s): H. Nelson
Date/Time: 3-10-2014 1158
Weather: Cloudy 20-30's

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time:
Sample Collection Method: ☐ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☐ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes: Frozen & unable to clear. 005CP-01 was not sampled

Sampler Signature: Heidi J Nelson

Surface Water Sampling Record

Project Name: JBER LTM
Location ID: OU5GP-01 (CP) 14ST037QZ-OU5CP01-SP-0
Project Location:
Sample No.: ~~14ST037-OU5CP01-SP-0~~ (SP) (ML)
Project Number:
Sampler(s): ML/JY
Date/Time: 7/8/14 1100
Weather: Sunny ~65°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep
Sample Time: 1115
Sample Collection Method: ☒ Grab ☒ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
–	–	–	–	–	–	–

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 liter	☒ Glass ☐ Plastic	SW8270 PAH's
3	40 ml	☒ Glass ☐ Plastic	SW8260 VOC's (HCL)
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Mary Jane

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5CP-01
Project Location:	JBER-E	Sample No.:	14ST037-OU5CP01-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 10:41	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 10:41

Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5CP-01
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5CP01-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 11:49	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 11:49

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes: Duplicate sample ID #: 14ST037-Q4-OU5CP01-SP-1

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name: JBER ATM
Location ID: OUSCP-02
Project Location: ST037 Q1 OUS Setup
Sample No.: 14ST037Q1-OUSCP02-SW-0
Project Number: 20077.049.016.5020.03
Sampler(s): H. Nelson
Date/Time: 3-10-2014 1200
Weather: Cloudy 20°-30°

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Other:
Sample Time: 1202
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): clear / red organics / odorless

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40 mL	☒ Glass ☐ Plastic	SW8260B
2	1L	☒ Glass ☐ Plastic	SW8270C SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Heidi J. Nelson

Surface Water Sampling Record

14ST0337Q2-OU5CP02-SP-0

Project Name: JBER LTM
Location ID: OU5CP-02-
Project Location:
Sample No.: ~~14ST0337-OU5CP02-SP-0~~ ML
Project Number:
Sampler(s): JY/ML
Date/Time: 7/8/14
Weather: Sunny ~65°F

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: seep
Sample Time: 1109
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
–	–	–	–	–	–	–

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
2	1 liter	☒ Glass ☐ Plastic	SW8270 PAHS
3	40mL VOA	☒ Glass ☐ Plastic	SW8260 VOC's (HCL)
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5CP-02
Project Location:	JBER-E	Sample No.:	14ST037-OU5CP02-SP-0
Project Number:	20077.049.016.5030.03	Sampler(s):	J. Young, L. Hermanns
Date/Time:	9/9/2014 10:44	Weather:	45F, Rainy

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 10:44

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☒ Glass ☐ Plastic	SW8260B VOC
2	1L Amber	☒ Glass ☐ Plastic	SW8270D SIM
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Jess Young

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	OU5CP-02
Project Location:	JBER-E	Sample No.:	14ST037-Q4-OU5CP02-SP-0
Project Number:	20077.49.016.5030.03	Sampler(s):	J. Young, S. Jordan
Date/Time:	12/16/2014 11:55	Weather:	30F, Sunny

Sample Collection Method & Analysis

Sample Type: ☐ Surface Water ☒ Other: Seep

Sample Time: 11:55

Sample Collection Method: ☐ Grab ☒ Bailer ☐ Other:

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type		Laboratory Analysis
3	40mL VOA	☒ Glass	☐ Plastic	SW8260B
2	1L Amber	☒ Glass	☐ Plastic	SW8270D SIM
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	
		☐ Glass	☐ Plastic	

Notes:

Sampler Signature: Jess Young

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	ST41-10R
Project Location:	JBER-E	Sample No.:	14ST041-ST4110R-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	A. Thompson, H. Graham
Date/Time:	9/10/2014 13:53	Weather:	50F, Cloudy, rain

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
12:25	16.90 ft ☑ Meas. ☐ Hist.	8.80 ft Initial	8.10 ft	1.32 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.07

Begin Purge: Time: 12:48 PM Total Volume Purged: 4.1

End Purge: Time: 13:51 PM Well Volumes Purged: 3.1

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/10/2014 13:53

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sample for VOCs. Well is frost jacked; need to cut off extra PVC pipe for lid to lock.

Sampler Signature: Anne Thompson

Date: 9/10/2014 13:53 Well ID: ST41-10R

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
12:58	9.62	0.50	9.38	0.814	0.47	6.15	40.2	14
13:05	9.72	0.50	9.62	0.782	0.83	6.33	18.7	8.0
13:08	9.89	0.70	9.10	0.782	0.73	6.25	19.3	6.0
13:12	9.95	1.10	9.07	0.785	0.55	6.25	18.7	5.0
13:18	9.98	1.80	9.24	0.784	0.41	6.32	11.1	4.0
13:24	10.05	2.40	9.27	0.767	4.80	6.32	8.1	
13:30	10.15	3.00	9.26	0.756	4.30	6.36	1.7	
13:35	10.32	3.40	9.04	0.752	2.50	6.33	1.1	
13:40	10.35	3.60	9.16	0.752	2.20	6.36	-3.4	
13:46	10.50	4.00	9.02	0.744	0.18	6.35	-6.0	
13:51	10.52	4.10	9.08	0.741	1.20	6.25	-7.8	

Notes : turbidity malfunction at 1324.

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	ST41-16
Project Location:	JBER-E	Sample No.:	14ST041-ST4116-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, H. Graham
Date/Time:	9/15/2014 14:32	Weather:	50F, Raining

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
13:38 PM	22.37 ft ☑ Meas. ☐ Hist.	16.31 ft Initial	6.06 ft	0.99

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 13:50 PM

End Purge: Time: 14:30 PM

Total Volume Purged: 3

Well Volumes Purged: 3

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/15/2014 14:32

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): Clear, Strong Hydrocrbon odor

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Product measured in well with an approximate thickness of 0.03 feet. Turbidimeter was malfunctioning and giving error message #7.

Sampler Signature: Moana Leirer

Date: 9/15/2014 14:32 Well ID: ST41-16

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
13:59 PM	16.75	0.75	8.47	1.595	0.37	6.49	-1.30	5.32
14:05 PM	16.80	1.25	8.73	1.605	0.31	6.60	-20.2	
14:11 PM	16.80	1.60	8.98	1.610	0.32	6.63	-27.8	
14:15 PM	16.85	1.90	9.14	1.615	0.33	6.66	-28.1	
14:19 PM	16.95	2.25	8.99	1.618	0.25	6.67	-32.8	
14:24 PM	17.00	2.50	8.81	1.610	0.10	6.65	-34.5	
14:28 PM	17.03	2.90	8.85	1.609	0.10	6.67	-37.5	
14:30 PM	17.04	3.00	8.87	1.609	0.11	6.68	-39.1	

Notes : Heavy odor. Turbiditymeter malfunction at 14:05

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	ST41-25
Project Location:	JBER-E	Sample No.:	14ST041-ST4125-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, H. Graham
Date/Time:	9/15/2014 13:15	Weather:	50F, Raining

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
13:15	13.67 ft ☑ Meas. ☐ Hist.	3.47 ft Initial	10.2 ft	1.66 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.06

Begin Purge: Time: 12:51 Total Volume Purged: 1.3

End Purge: Time: 13:13 Well Volumes Purged: 0.78

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/15/2014 13:15

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☑ Y ☐ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): Clear, strong hydrocarbon odor

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Collected VOCs. Sheen on water but it's less than 0.05' thick.

Sampler Signature: Moana Leirer

Date: 9/15/2014 13:15 Well ID: ST41-25

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
13:01	3.58	0.50	10.23	0.900	0.27	6.58	-24.7	25.7
13:04	3.58	0.75	10.23	0.905	0.26	6.63	-29.7	13.6
13:07	3.59	1.00	10.23	0.909	0.22	6.68	-29.5	9.10
13:10	3.59	1.10	10.24	0.912	0.17	6.70	-26.2	7.56
13:13	3.58	1.30	10.27	0.912	0.15	6.72	-24.4	5.68

Notes :

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	ST41-28
Project Location:	JBER-E	Sample No.:	14ST41-ST4128-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson
Date/Time:	9/11/2014 8:36	Weather:	45F, Sunny

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
9/11/14 8:30	26.84 ☑ Meas. ☐ Hist.	23.20 Initial	3.64 ft	0.59

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: N/A

Begin Purge: Time: 15:00 Total Volume Purged: N/A

End Purge: Time: 15:30 Well Volumes Purged: N/A

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 9/11/2014 8:36

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): Grey, strong hydrocarbon odor

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
12	40mL VOA	☑ Glass ☐ Plastic	SW8260B VOCS
		☑ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Well ran dry on 9/10/14 at 15:30. Returned on 9-11-14 and collected a grab sample for VOCs.
Very strong hydrocarbon odor and sheen.
Additional Samples: 14ST041-ST04128-GW-MSD, 14ST41-ST4128-GW-1, 14ST41-ST4128-GW-MS

Sampler Signature: Moana Leirer

Date: 9/11/2014 8:36 Well ID: ST41-28

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
15:12	25.1	0.40	7.51	1.434	0.3	6.32	-4.20	576
15:22	1.50	1.40	7.79	1.405	0.2	6.59	-32.7	574

Notes : Grab sample: no purging data.

Surface Water Sampling Record

Project Name:	JBER-E 2014	Location ID:	ST41SW-13
Project Location:	JBER-E	Sample No.:	14ST041-ST41SW13-SW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	M. Leirer, A. Thompson, L. Hermanns
Date/Time:	9/11/2014 13:37	Weather:	Sunny, 45°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Other:

Sample Time: 13:37

Sample Collection Method: ☑ Grab ☐ Bailer ☐ Other:

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Field Parameters

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260 B VOCS
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Sampler Signature: Moana Leirer

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU6MW-92
Project Location:	JBER-E	Sample No.:	14WP014-OU6MW92-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	A. Thompson, H. Graham
Date/Time:	11/5/2014 8:37	Weather:	Partly cloudy, 30F

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11/4/14 14:30	39.74 ft ☑ Meas. ☐ Hist.	32.80 ft Initial	6.94 ft	1.13

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: NA

Begin Purge: Time: 14:40 PM

Total Volume Purged: NA

End Purge: Time: 15:11 PM

Well Volumes Purged: NA

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 11/5/2014 8:37

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
3	40mL VOA	☑ Glass ☐ Plastic	SW8260B
		☐ Glass ☑ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

Well ran dry on 11/4/2014. Grab sample collected 11/5/2014.

Sampler Signature: Anne Thompson

Date: 11/5/2014 8:00 Well ID: OU6MW-92

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Notes :

Grab sample; no purge data.

Groundwater Sampling Record

Project Name:	JBER-E 2014	Well ID:	OU6MW-93
Project Location:	JBER-E	Sample No.:	14WP014-OU6MW93-GW-0
Project Number:	20077.049.016.5030.03	Sampler(s):	A. Thompson, H. Graham
Date/Time:	11/4/2014 13:55	Weather:	25F, Sunny, clear

Water Level Measurements and Purge Data

Time	Depth of Well (TOC)	Depth to Water (TOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163 gal/ft, 4" dia.=0.653 gal/ft)
11:40	65.61 ft ☑ Meas. ☐ Hist.	54.07 ft Initial	11.54 ft	1.9 gal

Water Level Measurement Method: ☑ Electric Tape ☐ Other:

Well Evacuation Method: ☐ Peristaltic Pump ☑ Submersible Pump ☐ Bailer ☐ Other:

Purge Rate: 0.08

Begin Purge: Time: 12:56 PM

End Purge: Time: 13:54 PM

Total Volume Purged: 4.7

Well Volumes Purged: 2.5

Purge Water Disposed: ☐ 55-gal Drum ☑ Storage Tank ☐ Ground ☐ Liquabin ☐ Other:

Purge water taken to Fort Richardson contractor yard.

Sample Collection Method & Analysis

Sample Type: ☑ Groundwater ☐ Surface Water ☐ Other:

Sample Time: 11/4/2014 13:55

Sample Collection Method: ☑ Pump Type: Hurricane Dedicated ☐ Y ☑ N ☐ Bailer ☐ Other:

Decon Procedure: ☐ N/A ☑ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.):

Sample Containers

Quantity	Size	Bottle Type	Laboratory Analysis
6	40mL VOA	☑ Glass ☐ Plastic	SW8260B
		☐ Glass ☐ Plastic	
		☑ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	
		☐ Glass ☐ Plastic	

Notes:

VOCs . This was a DUP.

Additional Samples: 14WP014-OU6MW93-GW-1

Sampler Signature: Anne Thompson

Date: 11/4/2014 13:55 Well ID: OU6MW-93

Well Evacuation / Field Parameters

Time	Depth to Water (TOC)	Volume (gallons)	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity
13:06	54.16	0.90	4.77	0.403	0.74	6.71	-22.6	160.8
13:16	54.17	1.40	5.34	0.407	0.49	6.71	-27.6	7520
13:26	54.14	2.50	5.42	0.408	0.37	6.69	-35.0	22.6
13:33	54.15	3.00	5.35	0.407	0.33	6.68	-42.1	9.49
13:42	54.15	3.90	5.31	0.407	0.26	6.67	-50.4	5.48
13:46	54.15	4.20	5.51	0.407	0.28	6.66	-54.0	5.31
13:51	54.15	4.50	5.75	0.407	0.20	6.67	-62.2	3.07
13:54	54.15	4.70	5.54	0.407	0.21	6.67	60.2	2.58

Notes :

2014 Field Parameters JBER-Elmendorf, CERCLA SITES

Parameter value recorded at the time of sample collection

Monitoring Well ID	Time	Water Level (ft bgs)	Volume Purged (gallons)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)
DP098 Field Parameters									
41755WL-02	10:24[a]	9.16	5.7	5.73	0.675	7.38	0.09	10.37	68.3
41755WL-03	10:38	--[b]	12	6.78	1.098	621	6.67	7.80	-70.9
41755WL-04	12:50	17.70	2.5	7.09	1.184	--[c]	0.20	8.07	-86.6
41755WL-05	11:35	14.82	3.0	6.50	0.990	23.6	0.25	8.87	-44.7
41755WL-07	9:45	8.81	5.0[d]	6.13	0.291	2.42	1.41	9.33	26.4
41755WL-08	16:29	5.86	3.9	5.82	0.532	8.01	0.88	7.36	102.6
41755WL-09	10:00[d]	6.71	2.0	7.59	0.467	2.64	1.36	7.11	79.8
DP98INJ-02	13:00[e]	14.72	<2.5	--	--	--	--	--	--

Notes:

a - Exceeded drawdown and 3 well volumes were purged. Water quality parameters were not recorded immediately at the time of sampling, but were recorded approximately 30 minutes prior to sampling.

b - A water level measurement was not collected before the sampling occurred. Approximately three well volumes was purged from the well prior to sampling.

c - Turbidimeter had a malfunction and a turbidity reading was unable to be measured.

d - Exceeded drawdown, but well began to recover and samples were collected well when parameters stabilized.

e - Well purged dry, grab sample collected the following day. Water level measurement collected prior to purging.

LF004 South Field Parameters									
OU6MW-67	12:32	64.41	2.3	6.96	0.447	13.05	0.82	4.89	-104.9
LF059 Field Parameters									
LF059MW-02	8:47	15.82	1.3	5.00	0.320	1.90	0.17	6.39	196
LF59MW-03	10:59	28.68	1.6	6.37	0.293	11.8	0.21	8.11	7.50
SD015 Field Parameters									
OU6MW-17	9:33	42.39	2.5	6.00	0.696	7.41	0.24	6.28	-0.40
SD025 Field Parameters									
OU4MW-08R[a]	12:10	29.52	5.5	6.64	0.447	5.94	3.25	6.64	-102.0
OU4MW-08R[b]	11:31	29.25	2.25	6.30	0.481	9.44	0.22	7.72	43.3

Note:

a - Sampled was collected on April 10, 2014

b - Sampled was collected on September 15, 2014

SD029 Field Parameters									
IS6-01	14:38	47.00	3.75	7.17	0.461	6.72	1.51	8.87	60.4

2014 Field Parameters JBER-Elmendorf, CERCLA SITES (continued)

Parameter value recorded at the time of sample collection

Monitoring Well ID	Time	Water Level (ft bgs)	Volume Purged (gallons)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)
ST037 Field Parameters									
OU3MW-02	14:20	26.15	2.5	6.95	0.465	-- [a]	0.48	8.70	55.4
OU3MW-11	9:57	10.39	2.5	6.54	0.730	1.55	0.22	7.46	154.8
OU5MW-06	10:30	33.81	3.5	6.93	0.417	1.20	4.02	8.61	109.8
OU5MW-07	9:15	31.69	2.5	6.54	0.350	3.70	0.74	7.35	156.7
OU5MW-08	11:45	16.31	1.75	6.51	0.299	0.90	4.49	8.95	121.7
OU5MW-15	13:35	10.65	1.5	7.17	0.525	3.6	0.19	10.44	116.9
OU5MW-34	8:25	29.51 [b]	--	--	--	--	--	--	--
OU5MW-38	10:10	28.54	5.0	6.58	0.535	9.14	3.69	7.55	137.4
OU5MW-44	15:10	29.66	4.0	7.04	0.414	15.4	3.44	10.98	116.0
OU5MW-46	11:20	34.22	3.0	6.84	0.555	20.5	0.30	8.26	120
403WL-01	12:30	39.02	2.5	7.16	0.666	3.56	0.20	7.95	2.00
GW-4A	11:45	5.37	1.1	6.87	0.444	1.18	0.23	7.86	31.5
SP1-02	13:25	34.07	1.5	7.00	0.497	5.11	0.30	8.31	40.2

Notes:

a - Turbidimeter had a malfunction.

b - Well was damaged and neither field parameters or groundwater samples were collected.

ST041 Field Parameters									
ST41-10R	13:51	10.52	4.1	6.25	0.741	-- [a]	1.2	9.08	-7.80
ST41-16	14:30	17.04	3.0	6.68	1.609	-- [a]	0.11	8.87	-39.1
ST41-25	13:13	3.58	1.3	6.72	0.912	5.68	0.15	10.27	-24.4
ST41-28	8:30	23.20 [b]	~0.59	--	--	--	--	--	--

Notes:

a - Turbidimeter had a malfunction.

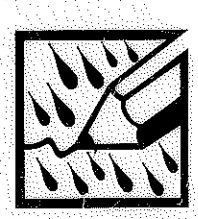
b - Well purged dry, recovered the next day and retrieved grab sample

WP014 Field Parameters									
OU6MW-67	12:32	64.41	2.3	6.96	0.447	13.05	0.82	4.89	-104.9
OU6MW-92	-- [a]	--	--	--	--	--	--	--	--
OU6MW-93	13:54	54.15	4.7	6.67	0.407	2.58	0.21	5.54	60.2

Notes:

a - Well purged dry, grab sample collected the following day.

FT023 Field Parameters									
OU4MW-11	14:48	43.95	1.6	6.66	0.829	4.57	1.34	7.48	-11.6



"Rite in the Rain"®

ALL-WEATHER

FIELD

No. 350N

2014 JBER
GROUNDWATER #1 of 2

3/10/2014 THROUGH 10/1/14

FA8903-09-D-8589 T.O. 0016

H. Nelson
H. Littlefield

JBER Groundwater

3

ST037 3-10-14

0830 met at warehouse, H. Nelson and H. Littlefield. Safety, tailgate
0900 left warehouse w/ equipment, went to TTT to get bailers.
0915 left TTT to go to office to grab WP
0940 arrived at Railyard to begin Sup sampling at. OUSSP-11, OUSSP-10 & ~~OUSSP-09~~ WCSW-03
1030 moved down, OUSSP-10 was frozen and unable to sample. Sampling WCSW-04 and WCSW-02
1115 finished & left to get OUSSP-07.
1150 moved down to get OUSCP-01, OUSCP-02 OUSSP-01 and OUSSP-02
1220 sampled OUSCP-02, OUSCP-01 was frozen and used small bailers for OUSSP-01, OUSSP-02
1225 leaving Railyard to break for Lunch.
1240 left Railyard & called Railyard police
1255 break for lunch
1340 arrived at field trailer to grab 5/4" bailers.
1416 arrived at OUSSP-01 at railyard, sampled at OUSSP-01 and OUSSP-02.

H Nelson
H Littlefield

JBER Groundwater

ST037

3/10/2014

1500 finished at railyard. Sampled OUSP-01. But OUSP-02 was frozen and unable to sample. Sample bottles and details are all on surface water data sheets.

1515 arrived at Beaver Pond to collect SW at BPSW-01 and DUP

1540 leaving golf course to head to warehouse

1610 arrived at warehouse and unloaded the truck. Used personal (H. Nelson) truck, 34 miles.

1625 End of day.

Heidi Nelson

3-10-2014

H Nelson
H Littlefield

JBER Groundwater

5

ST037

3/11/2014

0830 H. Nelson and H Littlefield met at warehouse. Safety tailgate. Loaded truck

0845 left warehouse to go to base

0915 arrived at Beaver Pond to sample BPSW04 and BPSW05.

1000 discussed LF04 Bluff w/ J. Young and left Beaver Pond

1030 arrived at warehouse to work on sample management.

1130 Break for lunch

1200 continue sample management.

1300 finished sample management.

1305 End of day. 21 miles H. Nelson personal truck

Heidi Nelson

3-11-2014

H. Nelson
6 # Litchfield
L. Herrmann

JBER Groundwater

ST037 3/12/2014

0830 met at warehouse, Safety Tailgate
0850 packed up truck and left warehouse to go to base.
0915 arrived at Beaurgard to hike to collect BPSW03.
0945 heading to LF04.
0955 arrived at LF04 to sample LF04SP03 and LF04SP04.
1105 leaving LF04
1120 arrived at field trailer to finish Sample summary and COCs
1145 leaving field trailer to break for lunch and go to warehouse
1230 arrived at warehouse & began Sample management.
1320 left warehouse to take Samples to the lab.
1335 dropped off Samples and end of field day. Heading to office

Heidi H. Nelson
3/12/2014

H Nelson
S Fejes

JBER Groundwater

7

ST036 / SD025 4/10/2014

0730 H. Nelson & S Fejes met at warehouse & loaded truck
0750 safety tailgate, cold weather, noise on flightline - car pro, driving into Sun. Safety Glasses and Sips/Trips/Falls
0800 arrived at TTT for equipment.
0810 left TTT to go to Base
0845 arrived at ST036 to meet SSGT Gallop to let us into the building 27869
0855 SSGT arrived at ST036.
0905 started at well BW27 @ ST036
1005 completed sampling, Sample time @ 0933 @ BW27 Sample point was same as sample collected in February. Removed hose and sampled directly from hose bib before any treatment system was introduced to water line.
~~HHW~~ left ST036 to go to field trailer and P/U buckets.
1110 arrived at SD025 to set up at well 004MW08B
1212 Sampled 004MW08B MS/D and Dup
1310 left SD025 for contractor yard

H. Nelson
S. Fejes

JBER Groundwater

SD030 / SD025 4-10-2014

1320 Left contractor yard after purging water to field trailer.
1325 arrived at field trailer - Break for lunch
1345 Began Sample management.
1440 leaving Base to go to warehouse to pack coolers and finish Sample management.
1510 Dropped off equipment to TT
1525 arrived at warehouse to finish Sample management
1620 arrived at TA's dropped off samples
1630 finished for the days.

H. Nelson
4-10-2014

SO512 4/23/14

Personnel: Aaron Metz & Kris Hadden
Weather: 50's & clear — AM
Objective: Gauge wells at SO512.
13:00 Stop by base OPs to gain permission to walk on the flightline by SZWL03. — AM
13:05 Depart Bse OPs for SO512.
13:15 Arrive at SO512

Well	DTW (ft)
SZWL03	24.66
421WL-02	28.09
421MW-01	26.73
SD025-MW01	32.53
SD025-MW02	27.66
SD025-MW03	25.75
SD025-MW04	38.64
OU4MW-08R	28.88

13:30 Off flightline and back to base OPs. — AM
13:45 Transducer pulled from 421MW-01. — AM
14:10 Transducer back in 421MW-01
14:40 Transducer out of OU4MW-08R. — AM

(2)

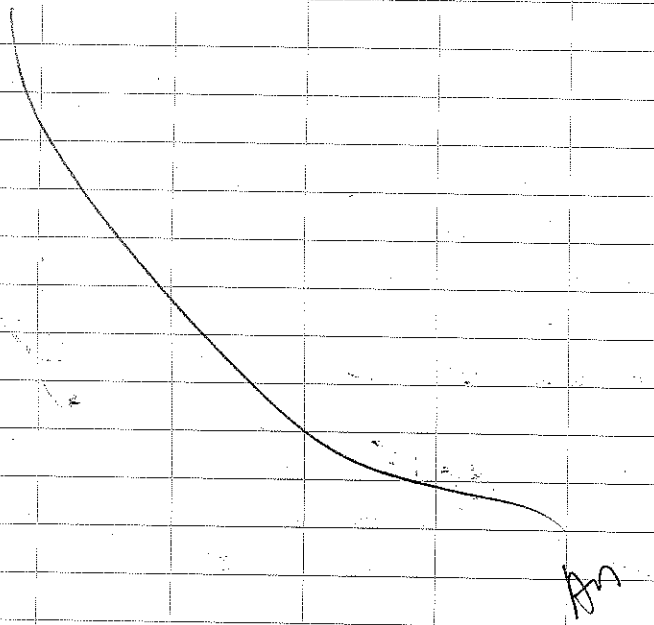
4/23/14

SOS12

14:55 Transducer back in OUCMW-OR

15:00 During gauging we searched for historical wells SZWL-01, SZWL-02 & SZWL-04 and were unable to locate them. Used a shovel & metal detector to try and locate the wells. Westar to OU1 Landfill to marksout proposed locations. ——— AM

16:25 Westar offsite. ——— A



4/28/14

WEATHER: SUNNY & 40

0700 MEET @ WAREHOUSE

0800 P/U EQUIPMENT FROM TTT

0845 ARRIVE @ JOBSITE YARD

0900 DEPART FOR CLOSED

0910 SET UP @ CLOSED MW-1N

SEE ALSO DATA SHEET

1135 FINISH UP @ CLOSED. HEAD TO STO48. STOP @ SAPPETTE - LUNCH

1200 SET UP @ STO48 (SEE DATA SHEET)

1310 DEPART FOR JOBSITE YARD

1330 SET UP @ OU1 CF GW1-A.

SEE DATA SHEET

1500 DEPART OU1 CF TO TAKE AIR SAMPLES TO THE VAN

1522 DROP SAMPLES OFF @ TA & HEAD TO TTT

1600 END OF DAY

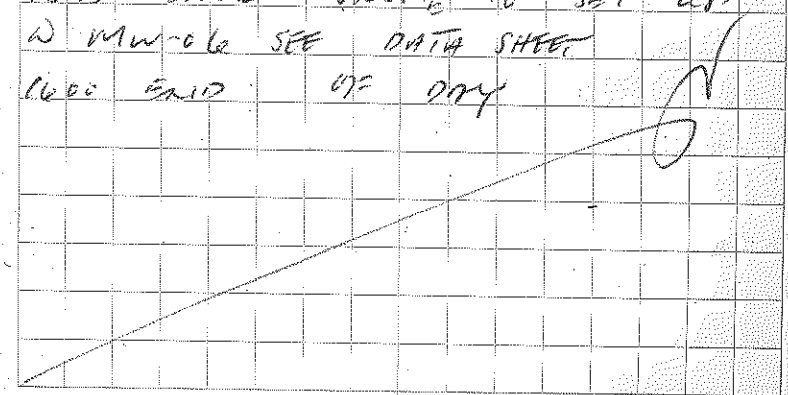
4/28/14

9/24/14

WEATHER: ~ 95°
SUNNY
PERSONNEL: JY/EB

0700 TAILGATE ✓
LOAD EQUIPMENT.
CHECK LOCKING KITS
0800 CAM CHECK YSI
RE-CALIBRATE YSI
pH 4.01 @ 15C = 4.00
4.00
pH 7.00 @ 15C = 7.00
7.02
CONDUCTIVITY @ 15C = 1146
1145
ORP @ 240 MV
= 240.1
0830 SET UP @ MW-17. SEE
DATA SHEET
0950 SET UP @ MW-10 SEE DATA
SHEET
1000 CAT TRUCK STUCK
1015 AM ONSITE. JM CALLS
WEBB TUNING FROM OFFICE
1030 JY/EB CONTINUE @ MW-10
1100 WEBB'S TUNING ONSITE.
DRIVER CALLS FOR MORE

LINE. AM BACK ONSITE. HEADS
TO GATE TO MEET OTHER
DRIVER.
1130 JY/EB FINISH SAMPLING
PERIMETER SAMPLE MEASUREMENT
1150 RETURN TO JOB TRAILER TO
D/L MORE LINERS, DISPOSABLE BAGS,
& PERSONAL VEHICLE
1200 AM ½ TON TRUCK DRIVER
GO MEET OTHER TON TRUCK
DRIVING FOR ADDITIONAL CUTTINGS.
1245 BEGIN TUNING TRUCK OUT
1330 AM MEETS TO DO COMPANY
CHARGE. JY/EB DETAIL SITE
FOR BATHROOM BREAK
1345 BACK ONSITE TO SET UP
@ MW-06 SEE DATA SHEET
1600 END OF DAY



4/30/14

WEATHER: SUNNY ± 40F

PERSONNEL: J/ED

0700 LOAD EQUIPMENT

0730 ON CHECK

YSI

RECALIBRATE

pH 4.01 @ 15C = 4.00

= 4.00

pH 7.00 @ 15C = 7.01

= 7.00

CONDUCTIVITY @ 16C = 1175

= 1171

ORP @ 240

= 240

0900 SET U/W @ MW-15C

COLLECT MS/D. SEE DATA SHEET

STOP @ JOB TRAILER TO UNLOAD

1050 SET UP @ MW-18. SEE DATA SHEET

1150 CLOSE UP @ MW-18. DRAWDOWN TUBING DOWN WELL ± 10' BTOC

1200 SET UP @ MW-04. SEE DATA SHEET

1300 M. LEINER ONSITE

TO HOME BASE COMMS

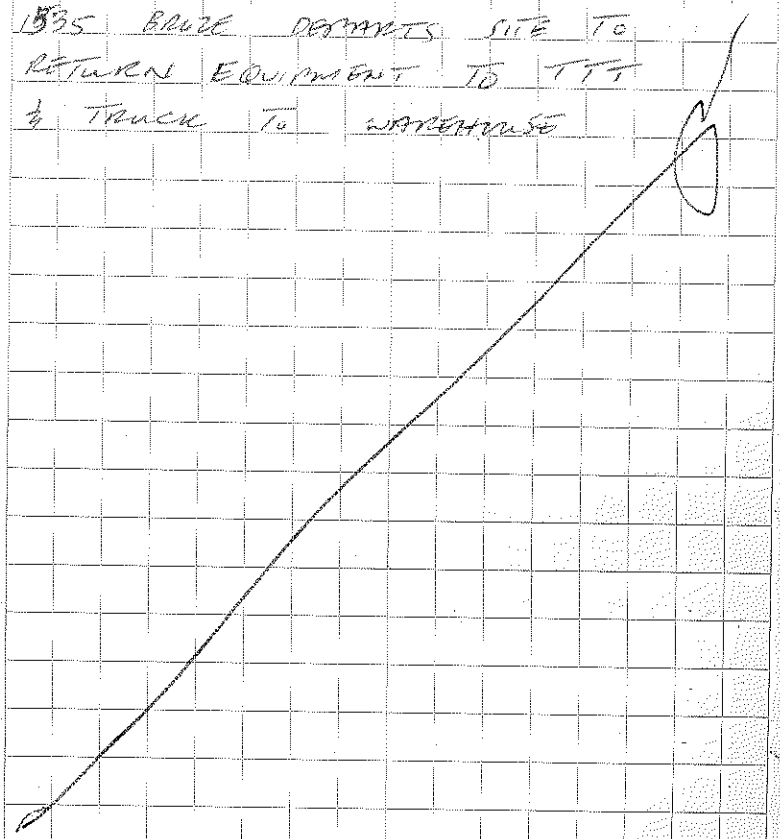
1315 SET UP @ GW-25. SEE ALSO DATA SHEET

1430 PURGE H_2O @ 10W

YMZO

1515 DC CLOSEOUT & CHAINS

1535 BRUCE DEPARTS SITE TO RETURN EQUIPMENT TO TTT & TRUCK TO WAREHOUSE



AREA - LEVEL LOGGERS & WELL LOCS

5/15/14 SUNNY, ± 60F

0730 P/U TRUCK & EQUIPMENT

0800 MEET JM @ OFFICE

0900 ARRIVE @ LBEC YARD.

DO BEFORE CHECK TAILGATE

OBJECTIVE:

VERIFY ABSENCE OF WELLS @

ST601 & CG541

READ LEVEL LOGGERS

0925 STOP @ CG541 FOR ABSENCE

VERIFICATION. NO WELLS.

0950 ARRIVE @ ST36/66

~~SGWL-03~~ ~~64.62~~

PULL OUT BAROLOGGERS & LEVEL LOGGERS

FROM SGWL-03

DTW: 64.62.

1000 PUT LL BACK IN WELL

1003 SGWL-08 - LL @ ± 16' BMC

DTW: 46.15

1010 SGWL-06

DTW: 57.04

1015 COMPUTER BATTERY DIED

1020 CALL PS ABOUT LL IN

SGWL-08. REDEPLOY AT

PRESENT DEPTH ± 1' BELOW

BOTTOM.

1050 DEPART ST36/66 TO

GO TO BASE OPS

1110 DEPART BASE OPS FOR

ST601

9442 - GATE CODE

1120 VERIFY ST601 NO

WELLS ONSITE

1130 DEPART SITE JM TO

RETURN TO WESTON OFFICE. JY

TO P/U ML AND FINISH

DOWNLOADING LEVEL LOGGERS

1205 ML/JY DEPART WESTON

OFFICE TO P/U ML EQUIPMENT

AND HEAD TO BASE.

1245 STOP IN @ BASE OPS. HAVE

HARD TIME ACCESSING SGWL-03

1345 SGWL-03 = 01120197.17

DTW: 24.41

TD: 33.73

1401 IN WELL

1410 PULL LEVEL LOGGER FROM
92WL-01
011201970
DTW: 26.44
MOVE TO SD025MW-01
SD025MW-01
DTW: 32.14
TD: 39.35
1420 DROP LOGGER
1430 PULL 011201973I FROM
CR 4MW-08R TO MOVE TO SD025MW-03
DTW: 28.41
1440 MOVE TO SD025MW-03
DTW: 25.31'
TD: 35.48
1453 Dropped logger into well SD025MW-03
1500 43WL-09
DTW: 18.71
1505 43WL-07
DTW: 16.41
1520 43WL-06 LID LABELED
DTW: 14.57 BV-LEB
INSIDE 43WL-06

1530 DEPART SITE

20

WX: PRETTY CLOUDY ~ 55°F
Field Personnel: JY/ML

7/8/14 Quarterly Seep/SW sampling

0730 Arrive Weston office gather some supplies & head to JBER - job trailer

830 - Prep for sampling & do tailgate safety. Using personal truck for sampling. Starting in rail yard first.

920 - Set out to sample OU5SP-11, & OU5SP-10 & WCSW-03

1000 - Start sampling WCSW-02, WCSW-04 & OU5SP-07. Collected duplicate of WCSW-02.

1045 - Move to OU5SP-01 & -02.

1120 - Set out to collect last remaining samples from the rail yard side OU5SP-01 & OU5SP-02

1200 1230 Break for lunch

1300 1250 Head to SGS to p/u more 1 liter ambers.

1330 Back on Base & prep to sample beaver pond area

1500 - Finished sampling & headed back to job trailer for sample management.

1630 End of Day

21

7/9/14

WX: Pt. Cloudy
Field P.: ML/JY

0700 - TO WESTON office to p/u PDB sample sheets, GW Book

0715 - ON BASE FOR TAILGATE SAFETY MEETING. PREP FOR SAMPLING

0745 - HEAD OUT TO START SAMPLING WELLS OUTSIDE JBER & WORK OUR WAY BACK ON BASE

1000 Proceed to sample PDBs around Beaver pond area

1130 Lunch

1200 Back to job trailer for sample managment/packing

1430 Taking trash to JBER IDW yard.

1500 Back @ JBER job trailer to scan GW sheets. Scanner is not working properly. Trying to fix the issue. Less to p/u

1630 End of Day

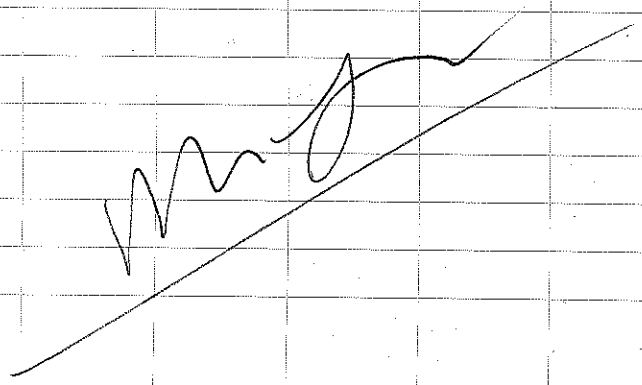
Hudson @ FT023

22

7/9/14 (7/10/14)
WX: Cloudy/rainy 55°F
Field Personnel: ML/JY

0700 At weston office print off maps for LF04 sample locations. Head to Base
0730 - Arrive at job trailer, tailgate safety meeting. Prep for sample collection
0800 - Head to LF04 sample area to collect 2 seep samples from LF04SP-03 & LF04SP-04.
815 LF04SP03 - collect sample
825 L004SP04 - collected sample
900 - Travel back to job trailer for sample management & Demobe

945 - Leave Base to deliver samples -OFFSITE



23

7/15/14
WX: Overcast ~60°F
Field P: ML/JY

0730 - arrive @ job trailer, tailgate safety meeting. Unload gear & prep for sampling. Plan to sample from cleanest to dirtiest
745 - Jess calibrated YSI
- pH → 4.00 @ 10°C / reads 4.04
  7.06 @ 10°C / reads 7.05

- CONDUCTIVITY @ 10°C = 1020
  Reads → 1015

- ORP @ 240 / reads 241.0

- % DO @ 765.7 / reads 100.6

815 - Begin to set up equip @ LF05-MW10
923 - Collect GW sample
935 - Move to next well
1039 - Collect GW sample @ LF05-MW16. Pack up & move to the next.

7/15/14 (continued)

1100 Locate OU1LF-23; well is in the woods. Cant access by vehicle 3 have to hike all the gear in

1115 Pump was sent to bottom of the well accidentally. GW was very turbid @ beginning of purge. Pumped @ high flow for 5 min. to remove sediment; then hooked it up to YSI

1300 Lunch

1330 Set up on well LFOSGW-2B

1415 Finished sampling, packing up 3 heading to JOW yard to dump purge H_2O.

1445 - Head to ST032 to collect GW levels for Melissa Mayer.

1545 - Back to job trailer to demobe 3 sample management

1630 ~~EA~~ OFFSITE

7/16/14

7/16/14

WX: Partly Cloudy
Personnel: ML/JS

0730 - onsite for tailgate safety 3ess to calibrate YSI

745 - Cal check YSI
750 - Begin calibration

pH → 4.01 @ 10°C / reads 4.00
7.00 @ 10°C / reads 7.06

CONDUCTIVITY @ 15°C = 1147
Reads 1145

ORP @ 240 mV
reads 240.2

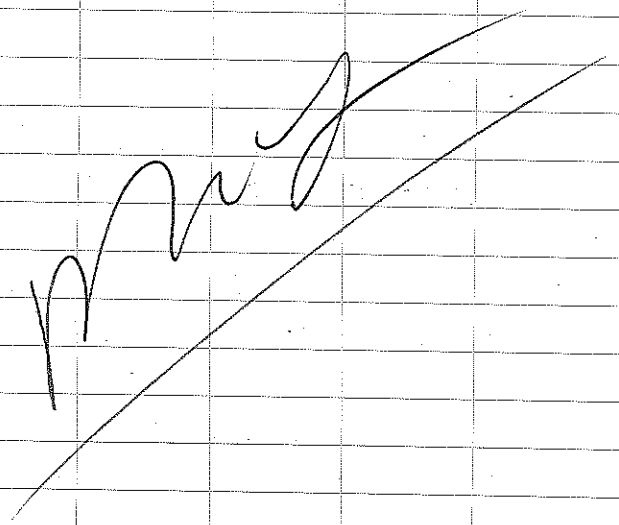
DO @ 763.9 / reads 100.6

815 - Begin setup at OU1LF-19R
949 - Begin sampling well for full suite w/ duplicate 3 MS/D.

7/16/15 (continued)

1100 - Head to job trailer to de mob, dump purge H_2O @ IDW yard & pack samples for Delivery

1330 - Jess to drop samples at the lab, Moana to TTT to return equipment & get supplies @ walmart - OFFSITE



CG702 GW sampling 7/20/14

WX: Clear ~55°F Sunny

F. Personnel: ME/JY

0730 - @ Weston office to p/u iPad.

0800 - P/u equip @ TTT & head to JBER job trailer. Jess to p/u glassware @ SGS & TR.

845 - Arrive @ Weston job trailer & prep to sample. ~~Calibrate YSI's~~ Checked YSI w/ confidence solution Both YSI's were within range

1015 - Head to CG702 to begin sampling. Jess set up on 702WL-02 to sample. She collected the MS/D & Dup from this well.

1110 - Moana begins w/ well ~~CG~~ 702WL-20 This is 0.75" well, using bladder pump on this well. Trace product in this well.

1300 702 WL-20 is going really slow w/ bladder pump

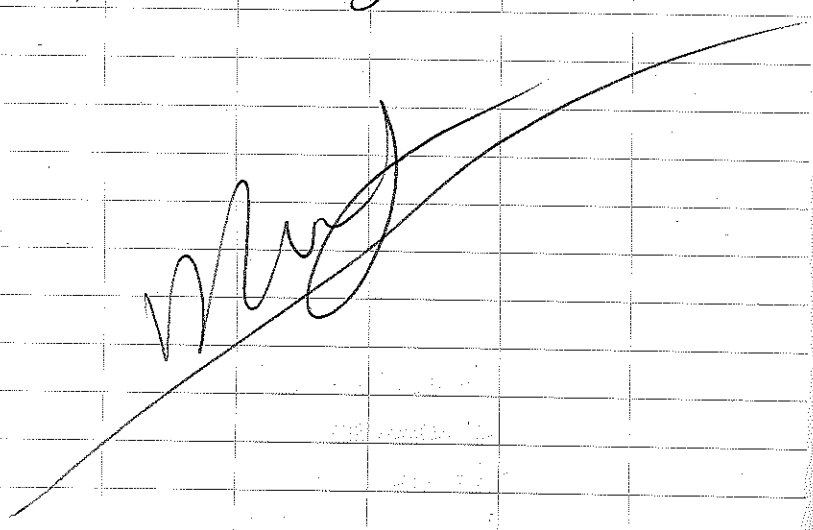
28 7/21/14

1400 - 702WL-20 still pumping slow. Less sampled wells 702WL-02, -03, -04 & pumped -05 dry.

1600 - Finish up @ CG702 for the day. Head back to job trailer to unload & refrigerate the samples

1630 - Head to TTI to return bladder pump.

1715 - End of Day



29

7/22/14

WX: Sunny 65°F
Field P.: ML/JY

0730 - Onsite to calibrate YSIs & pack up.

	Black	Grey
pH @ 4.01 @ 10°C → 4.00	4.00	4.00
pH 7.00 @ 10°C → 7.06	7.06	7.06
Conductivity @ 10°C	1020	1017
ORP @ 240	239.9	239.8
%DO @ 757.7	99.3	—
%DO @ 759.6	—	100.6

830 - Head to CG702 to collect more samples

943 collect GW sample from 702-WL-01

947 collect sample @ 702WL-14

7/22/14 (continued)

1030 - Move to well 702WL-12

1140 Collected sample at -12, 14CG702-702WL12-GW-01 w/ duplicate.

1248 - Collect sample 14CG702-702WL16-GW-0 from 702WL-16

1512 - Collect sample from 702WL-05. Purged dry on 7/21 so collected a grab sample today (no purge) for the Full HRC suite set

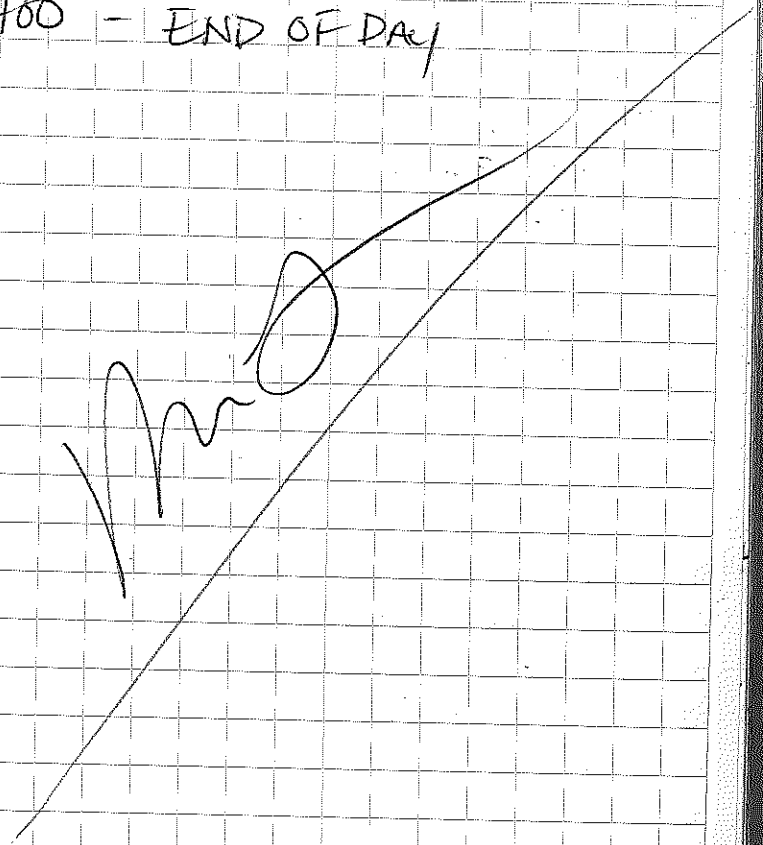
1436 Collected ~~PH~~ sample at 702WL-19 Tubing is stuck ~~at~~ in well, its out of site & reach. At the time of sampling it was pushed below water line. Not sure what depth the tubing is at.

1540 - Begin purging 702WL-07. Purged well dry ~ 3.5 gallons.

7/22/14

1615 - Pack up at CG702 & return to job trailer to unpack for the day.

1700 - END OF DAY



7/23/14
Wx: Cloudy ~55°F
Field P: ML/JY

0730 - onsite - Safety talk. Packed up truck to collect remaining sample @ CG702

0805 - Collect grab sample from @ 702WL-07 (no purge) Heavy fuel odor & trace product in the well. ↳ ~0.01'

915 - Back to job trailer to unload, process samples, & prep for delivery.

945 - Dumped Purge H_2O @ IDW YARD

1500 - Packed up trucks for sample & equip delivery.

ST048 Well Development

7/31/14
M. Leirer / A. Mroz
Wx: Cloudy 60°F

0730 - Meet at job trailer. Grab Weston Truck & head to ~~get~~ TTT, warehouse & SGS for supplies.

0930 - Arrive @ 60WL-07 to begin set up for development

955 DTW = 22.69
DTB = 31.06

1006 Begin surge for 10 minutes at the bottom of well/screen.

1017 - Begin pumping/collect WQ measurements

1032 - Begin surging bottom again for 5min. Turbidity got better @ end of pumping last round

1037 - Begin pumping/collect WQ Filling 5 gal bucket & timing to calc purge rate

5gals/4min = 1.25 gal/min

7/31/14

1048 - Begin surging middle of screen for ~ 5 min.

1059 - Begin pumping / collect WQ measurements

1106 - Stop pumping & begin surging top of screen

1114 - Begin pumping / collect WQ. At every GW start of pumping, GW is very turbid, but each time it "clears up" faster & faster

1121 - Stop pumping - begin surging the bottom of screen again.

1129 Stop surging - start pump from bottom of well screen ~ 1'-2" above bottom. Going to let pump for an extended period of time @ this location.

1136 GW is already becoming less

1147 turbid,

1150 Moved pump to middle of screen & pumped / WQ measurements

1156 - Moved pump to top of screen & pumped / WQ measure

1207 - Stopped pumping, filled 2 55-gal drums. Need to Dump & stop at job trailer

7/31/14

1320 - Back at GOWL-07 to do final clean up of well. Start pumping @ bottom to remove any settled sediment

1334 Moved pump to middle of column & pumped until turbidity < 10 NTU

1420 - Stop pumping / pack up & head to IDW yard to purge H_2O & job trailer to fill out timesheets.

1510 - Leave IDW yard. Go to LF008 to sample paint on wood poles

1530 - Begin collecting wood / paint sample from beam. Used a saw, screw driver & paint scraper. Collected 2 jars (8oz)

1700 - Head back to job trailer to unload. Will deliver wood sample to SGS tomorrow

1730

End of Day

ST048/CG509

8/5/14

WX - Sunny 65°
FP = ML/LE

1100 - Onsite Job Trailer, safety talk
1140 - Begin set up @ 401WL-07
1153 - Begin purging
1235 - Back to job trailer to get more sample jars & hydrate
1310 - Arrive @ 401WL-01 to begin purging. Very little water in MW less than approx. 1.5' of water
1323 Begin purging 401WL-01
1345 Moana back to trailer to get more sample jars. TA didn't give us enough jars!!

1410 Collect samples - Primary / Dup
14CG509-401WL01-GW-0/1
MS/MSD was also collected here
1500 - ~~Be~~ Finish sampling, begin packing up to head to job trailer & dump IDW at the IDW Container yard
1545 - Back at job trailer for sample management
1630 - ~~US~~ END of Day

8/25/14
WX: Raining ~55° F
FieldCrew: ML/EB

0900 - ML onsite to begin organization of coolers, sample jars etc..
945 - Elliot onsite to help organize & prep for sampling.

1045 - Head to Base Ops to get flightline access to gauge 5 MW's for the FT023 site. Also, going to TU091 to replace soil gas probe plugs.
1110 - Done @ TU091 - headed to base Ops (BO)
Long line @ BO, had to renew flightline training
1220 - Arrive @ FT023 after training & clearance from BO. Going to measure GW elev. in parking lot first (cleanest wells) & gauge according to contam. levels

1430 Finished gauging wells @ FT023. Back to job trailer to load gear for GW sampling. Will sample CG543

8/25/14

Crew: M.L EB

FT023 MW Elevations

Well	DTW	DTB	Time	
FP-52	39.95	46.29	1320	→ Well is jacked in 3 joints along PVC
FP-56	37.28	50.22	1335	→ LID is compromised SW from parking lot goes directly into the well. Cap cannot sit flush.
407MW-01	37.51	42.59	1405	
GW-5A	WELL CAP IS RUSTED		NR (ML)	
OU4W-11	44.19	58.67	1420	

1535 Arrive at CG543, set up to sample 44785WL-01 → AK102

1545 Begin purging

Exceeded drawdown. Purged over 3 well volumes ; then sampled

1645 - Finished sampling - Back to job trailer.

All measurements were recorded in iPad

No GW sheet for this well

1700 - Unpack truck for the day

1715 - End of Day

LTM Sampling 8/26/14

WX: Clear, ~50°F

Crew: ML/EB

0730 - onsite. Begin set up/packing for GW sampling

YSI's are super cold, brought into office trailer to warm up.

815 - Set out to sample the wells at SO552, CG527, CG509

845 - Attempted to retrieve tubing from 538WL-02. Can not reach it w/ tools on hand. Back to job trailer to get Lance's well tool.

910 - Retrieved tubing

538WL-02 2" well

DTW = 31.80' DTB = 37.60

Well volume = 5.8' x 0.163 = 0.95 gal

922 - Begin purging - Total purged = 2.4 gal

957 - Collected GW sample for AK101/BTEX/AK102

14CG527-538WL-02

1015 - Head to site CG509 to collect GW samples form 401WL-02 & 401WL-03

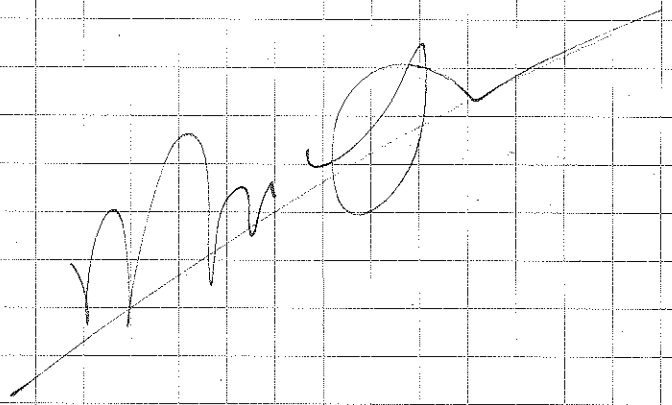
8/26/14

1050 401WL01 - Gauge well
DTW = 31.71 DTB = 34.39
Well volume = 2.68 x 0.163 = 0.44 gal
1059 Begin purging
1130 Collected sample ~~1414401WL~~ FOR AK101/AK102
14CG509-401WL02-GW-0
1145 Lunch
1215 Head to S0552
1240 402WL-02 - Gauge well
DTW = 15.16 DTB = 21.89
Well volume = 6.73' x 0.163 = 1.10 gal
1248 Begin purging
1320 Begin collecting primary sample @14S0552-402WL02-GW-02 + MS/MSD
Collected duplicat
14s0552-402WL-02-GW-1
Collected Analyses - SOC's, DRO/RRO, / GRO
1415 Packed up & heading to CG509 for one last sample for the day from 401WL-03

1425 - Arrive @ MW 401WL-03 & begin setting up.

8/26/14

1430 - 401WL03 Gauging
DTW = 33.58' DTB = 43.91
Well volume = 10.33' x 0.163 = 1.68 gal
1445 Begin purging well
Collect sample 14CG509-401WL03-GW-0
1525 for AK101 & AK102
1540 - Back to job trailer to ~~pack~~ unload for the day.
1600 - Head to TIP & SGS to p/u bladder pump & remaining coolers/jars/ice for LTM
1700 - End of Day



8/27/14

WX: Raining

Field Per: ML/EB

0730 - Onsite, calibrate PID.
Cal check YSI → out of range
Re-calibrate
pH 401 @ 10°C = 4.00
Reads = 4.00
pH 7.0 @ 10°C = 7.06
reads =
Conductivity @ 10°C = 1020
reads 1019
ORP @ 240mV reads 240.2

845 - Begin bladder pump set up on 529MW-IN
DTW = 28.46' DTB = 31.55'
GW gage interface appears to either be stuck @ 31.55' or well filled with sediment. We will try to collect a sample.

930 - No compressor for bladder pump. Jess will p/u from TTT. Moving on to site ST048

8/27/14
ML/EB
Raining

0950 - Set up on MW 60WL-04
DTW = 27.48 DTB = 34.34
Volume = 6.86 x 0.163 = 1.12gal

1000 - Begin purging

1025 - Collect sample 14ST048-60WL06-GW-0 for AK101

1030 - Pack up & move to next well 60WL-05
DTW = 24.68' DTB = 31.59

1104 - Volume = 6.91 x 0.163 = 1.13 gal

1108 - Begin purging

1152 - Collect sample 14ST048-60WL05-GW-0 for AK101

1220 - Leave site, head to job trailer to swap out pumps, debrief Jess

1315 - Arrive at 529MW-IN
TTT did not give us a connector for the battery to compressor. Back to TTT for 3rd time to get battery connector

8/27/14

1405 Back @ 529MW-1N for 3rd attempt to sample

1415 Begin purging 529MW-1N

DTW = 28.46 DTB = 31.55*

*No sure if this is the actual bottom of the well. Appears that the interface probe is getting stuck at 31.55. Used Well atlas Total well depth for volume calc. → Total Depth = 34.20

Volume = 5.74 x 0.02 = 0.114 gal

1440 Collected sample 14CG529-529MW1N-GW-0 for AK101 & AK102

1500 - Head to IDW yard to dump purge H_2O

1545 Back @ job trailer to unload & pack remaining samples

1630 - To TII to drop pump & samples @ SGS.

9/3/14

0800 - Meet Ann @ gate to get temp base pass — WX: Cloudy, 55°F Field P = AT/ML

825 - onsite, begin calibrating YSI

Cal check YSI - out of Range

Re-calibrate

pH 4.01 @ 10°C = 4.00

Reads = 4.0

ph 7.0 @ 10°C = 7.01

reads = 7.01

Conductivity @ 10°C = 1420

reads = 1424

ORP = @ 10°C = 225.7

reads = 240.1

To Base OPs to get flight line access

950 - set up on 59WL-~~06~~ 36R

DTW = 29.88 DTB = 40.45

Volume = 10.57 x 0.163 = 1.72 gal

1008 Begin purging - ~~water has a blue tint~~ (MG) Blue from cal solution

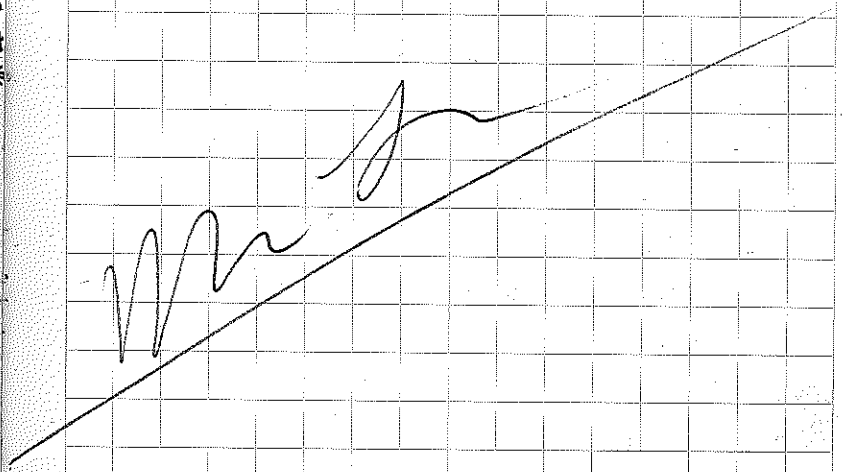
1040 - Collect sample 14ST032-59WL36R-GW-0 for AK101, AK102, SW8260B - BTEX

9/3/14

1135 - Arrive at 59WL-30
DTW = 31.09 DTB = 37.49
Volume = 6.4 x 0.163 = 1.04 gal
1153 Begin Purge
1220 - Collect sample
14ST032-59WL30-GW-0 for AK101, AK102, SW8260B-BTEX, lead SW6020 T/Diss
*Collect MS/MSD for AK101, ~~BTEX~~ AK102 only! (MU)
1245 Head Back to job trailer to place samples in Fridge & troubleshoot the ipad. It is giving error messages for unknown purposes.
1410 Arrive 59WL-31
DTW = 22.87 DTB = 28.49
Volume = 5.62 x 0.163 = 0.91
1419 Begin Purge
1450 Collected sample
14ST032-59WL31-GW-0/1
Field Dup also collected
AK101, AK102, SW8260-BTEX, 6020 lead Diss/Total ~~metals~~. Didn't field filter for diss. → lab will do it.
*Collected MS/MSD for Diss/Total Metals only.

9/3/14

1525 - Back to job trailer to demobe, label samples & pack up for the day.
1645 Synced ipad w/ server
1700 Ipad synced Done for the day



9/4/14
WX: Cloudy ~50°F
Field P: AT/ML

0730 - onsite load trucks & debrief second team (JY/LH)
815 - To Boniface gate to escort Anne
850 - Arrive at ST36/66 @ well 56WL-05
67.81 ← DTW = ~~67.81~~ 75 (MC) DTB = 73.30
Volume = 5.55' x 0.163 = 0.90 gal
902 - Start purging water
Pump issues / fix Pump
925 - Start Purging
Pump is not strong enough to pump water from this depth. Will call TTT & see if we can get a stronger pump.
957 - Start Purging again
Replace pump with new pump. Old pump had rust at connectors.
Having a really hard time adjusting the flow rate Either the regulator or the depth

1024 Collect sample @ 56WL-05
14ST036-56WL05-GW-0 for AK102
- Pack up move to next.
- replaced the lock at this site.

1059 - 56WL-02
~~1105~~ DTW = 70.30 DTB = 75.80
Volume = 5.50 x 0.163 = 0.896 gal
1106 - Start purging - but pump stopped pulled up tubing & check again everything seems fine trying again
1123 Start purging again - seems ok now
1149 Collect sample
14ST036-56WL02-GW-0 for AK102

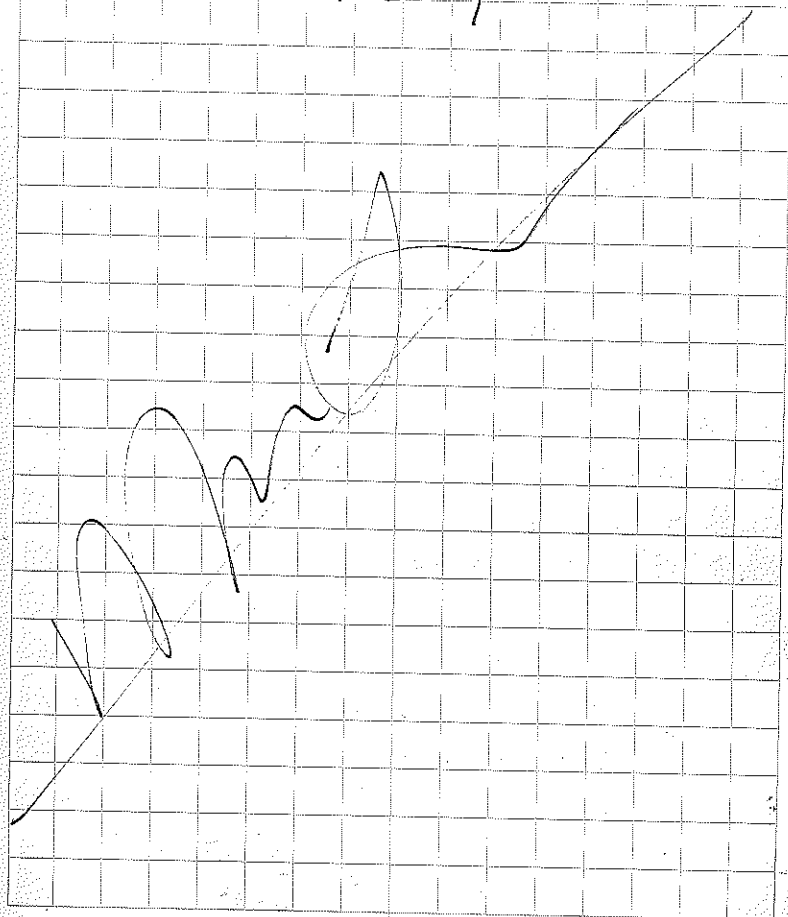
56WL-03
1228 - Remove Level Logger from MW
1231 DTW = 64.6 DTB = 71.18
Volume = 6.58 x 0.163 = 1.07
1239 Begin Purging
1307 Collect sample
14ST037-56WL03-GW-0 for AK102
1313 Replaced level/Barrow loggers
Removed tubing because can't store w/ loggers in well

9/4/14

56WL-01
DTW = 66.70 DTB = 76.99
Volume = x 0.163 =
Well appears jacked. Its leaning to the side & pump stops at 9' bgs. Cannot sample this well w/a Hurricane pump. Moving to next well.

1356 56WL-04
DTW = 64.70 DTB = 71.35'
Volume = X0.163 =
1407 Purge Begin
Lots of black flecks in GW
-Cleared up a little by sample time, but not much
1440 Collect sample
145T036-56WL04-GW-0
for AK102
Water had a slight sheen/odor
Packing up.
1500 Head to job trailer to get pump & purge H2O @ IDW yard Then demobe

1530 - TO IDW YARD TO DUMP Waste
-1600 - Back onsite to demobe
1700 - End of Day



9/9/14

WX: CLOUDY, LIGHT RAIN, ~50°F

FIELD PERSONNEL: AT/HG

0730: ONSITE LOAD TRUCKS

0750: BEGIN CALIBRATING YSI

CAL CHECK YSI - OUT OF RANGE

RE-CALIBRATE

PH 4.00 @ 18°C = 4.00

READS 4.0

pH 7.03 @ 17°C = 7.03

READS 7.03

CONDUCTIVITY @ 17.5°C = 1213 mS/cm

READS 1213 mS/cm

ORD @ 17°C = 240 mV

READS 240 mV

DO% @ 17°C = 99.8 %

0810: FINISH LOADING COOLERS AND EQUIPMENT INTO TRUCK

0830: DEPART FIELD TRAILER FOR 402MW-DG

0845: ARRIVE AT 402MW-DG, SET UP GROUP
THERE WAS NO INTERFACE PROBE IN THE BAG. WENT BACK TO TRAILER TO GET ONE

0905: SET UP AT 402MW-DG

DTW = 13.82' DTB = 16.21'

~~VOLUME = 0.024 x 2.39 = 0.05736 GALLONS~~

Volume = 0.042 x 2.39 = 0.1

9/9/14

0934: BEGIN PURGING

0.31 ~~0.36~~ AK gal for sample

Reached triple volume.

0955 Collect sample 1

1450552-402MWDG-GW-0

for VOC's, GRO, DRO, RRO.

1145: DEPART 402MW-DG

ST600MW-02

12:11 DTW 36.96' DTB = 47.95

~~Volume 10.99 x .024 = 0.2638~~

1225 Begin Purge

Volume 10.99 x 0.042 = 0.46

Orange Flakes in water

1307 Collect Sample 1450525-ST600MW-02-GW-0 for GRO; VOC's

→ 0955 Collect sample

1450552-402MWDG-GW-0

for MS/MSD

1450552-402MWDG-GW-1

for VOC's, GRO, DRO, RRO

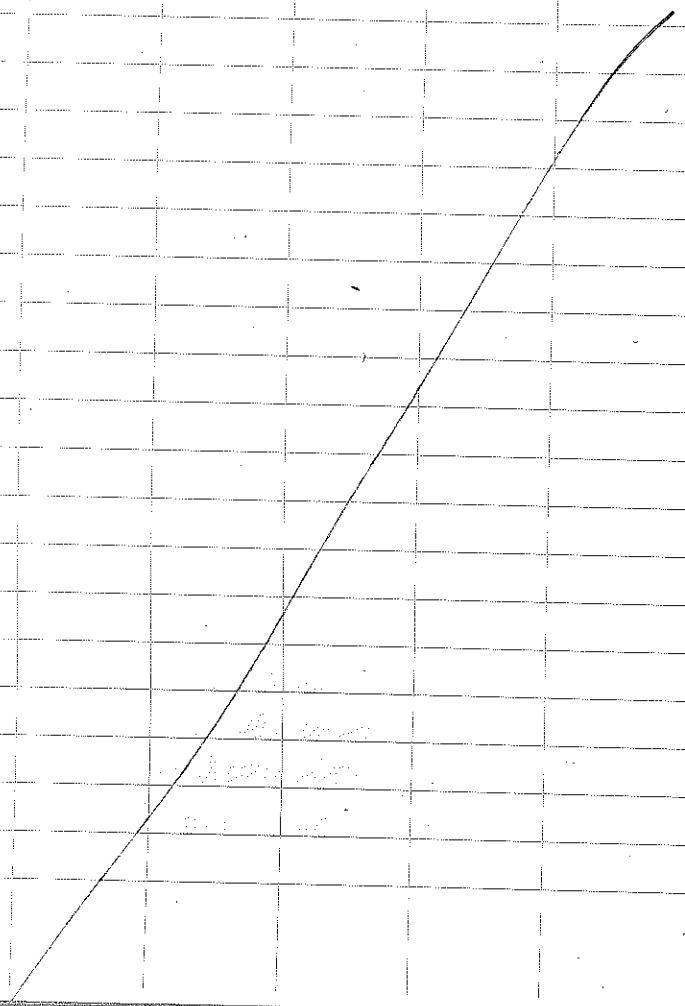
1345 - ST600MW-01

DTW = 35.92 DTB = 46.57

Volume 10.65 x .042 = 0.447

1407 Begin Purge

9/9/2014
1446 Collect Sample
1450525-ST600MW01-GW-0
for GRO and VOC's.
1500 To work shack for Demob
and sample management.



9/10/14
WX: Cloudy, RAIN, 80's
Rec Preparer = AT/HG

0730: Begin Calibrating YSI
Cal Check YSI - Out of Range
Re-Calibrate
PH 4.0 @ 15.27°C = 4.00
Reads 4.00
PH 7.03 @ 15.27°C = 7.06
Reads 7.03
Conductivity @ 15.54°C = 1141 mS/cm
Reads 1160 mS/cm
ORP @ 15.52°C = 241.9 mV
Reads 240.0 mV
DOG @ 16.81°C = 97.0%
Reads 99.8%
0800: Load Equipment into Trucks
0815: Depart Field Station for Base Ops
0830: Arrive at Base Ops to let them
know we'll be collecting samples
on the flight line
Base Ops Phone Number: 552 2107
Lock Code for Gate: 4442
0845: At Gate Flight Line Driving Recertification

9/10/14

0900: DEPART BASE OPS

0920: DRIVE ONTO FLIGHT LINE, LOCATE WELL AND PARK TRUCK AT WELL

0930: SET UP AT 534 MW-02

DTW: ~~———~~ DTB: ~~———~~

TUBING STUCK DOWN IN CURB RETURN TO TRAILER/CONEX TO FIND SOME TOOLS TO FISH IT OUT.

0955: ARRIVE BACK AT 534 MW-02

DTW: 32.81 DTB: 41.08

VOLUME = 8.27ft X 0.163 gal/ft = 1.348 gal

1017: BEGIN PURGING

1105: COLLECT SAMPLE

14TU107-534MW02-GW-0

FOR 8260 - BRO

1125: DEPART 534MW02 FOR FIELD TRAILER

1225: ARRIVE AT ST41-10R

DTW: 8.80 DTB: 16.90

VOLUME = 8.1ft X 0.163 gal/ft = 1.32 gallons

1248 Begin Purge

1353 COLLECT SAMPLE

14ST041-ST41 10R-GW-0

FOR VOCs - 8260

1410 DEPART ST41-10R

9/10/14

1410: WELL ST41-10R IS FROST JACKED. NEED TO REVISIT WELL TO CUT DOWN PVC PIPE SO WELL CAP CAN BE LOCKED

1430: ARRIVE AT ST41-2B

DTW: 23.20 DTB: 26.84

VOLUME = 3.64 ft X 0.653 = 2.38 GALLONS

1500: BEGIN PURGE

1530: WELL PUMPED DRY - RECHARGE IS VERY SLOW, .1 INCH OF RECHARGE TOOK ABOUT 5 MINUTES. PULLED EQUIPMENT. WE WILL CHECK WATER DEPTH IN THE MORNING AND REASSESS.

1600: DEPART ST41-2B

1615: RETURN TO TRAILER UNLOAD EQUIPMENT FROM TRUCK

1630: DEPART SITE

9/11/14

WX: Clear, Sunny, a 45°F
Field Personnel: LH/ML/AT

0730 - Onsite prep for sampling
0800 - Anne on site, load car
0830 - Arrive @ ST041-28 to collect grab samples for VOC's
0836 - Collect 14ST041-ST04128-GW-0/-1 Duplicate & MS/D
850 - Cut the well down at ST041-10R Well will need resurveyed.
0900 Arrive @ LF04 for seep sampling
0920 Collect 14LF04-LF04SP04-GW-0 for VOC's
0926 Collect 14LF04-LF04SP03-GW-0 for VOC's
10:15 Collect 14LF04-LF04SP02-GW-0-1 Dup & Dup + MS/D for PAH only. * VOC's for Primary.
1031 Collect 14LF04-LF04SP02DG-GW-0 + VOC's
1100 - Back to job trailer to get additional jars & eat.
1145 - Met Steve J. at Government Hill gate to get GPS.
1230 - Arrive at ST041 & prep for seep sampling

9/11/14

1337
~~1330~~ - Collect 14ST041-ST41SW13-SW-0 for VOC's only
1415 - Head to LF059 to collect seep sample.
1435 - Collect 14LF059-LF059091SEEPSE-GW-0 For VOCs → Primary only.
SVOCs
Total Metals → Dup + MS/D
Diss. Metals
1500 - Head to OU5SP-15 to retrieve bailer that was dropped in the well.
1530 - Could not see or locate the bailer. It appears that the seep is still sampleable. Back to job trailer to unload
1615 - End of Day

9/12/14

Wx: W Raining ~50°F

Field Personnel: ML / HL

Calibrate YSI

Cal check → confidence solution

its in range. No need to calibate.

800 - Head to SD15 to begin sampling

820 Arrive @ OU6MW-17

DTW = 42.12' DTB = 54.34'

Volume = 12.22 x 0.163 = 2.0 gal

835 - Regulator not working. Return to trailer to get the other regulator

907 - Begin to purge OU6MW-17

935 - Collect sample

14SD015-OU6MW17-GW-0

for VOC's

Cut top off of MW so the lid could be shut. Will need resurveyed. Put a new well cap on also.

1025 - Arrive at LF59 MW-03

DTW = 28.66' DTB = 39.54'

Volume = 10.88 x 0.163 = 1.77

1035 - Begin purge @ LF59MW-03

1100 - collect 14LF059-LF59MW03-GW-0 for VOCs

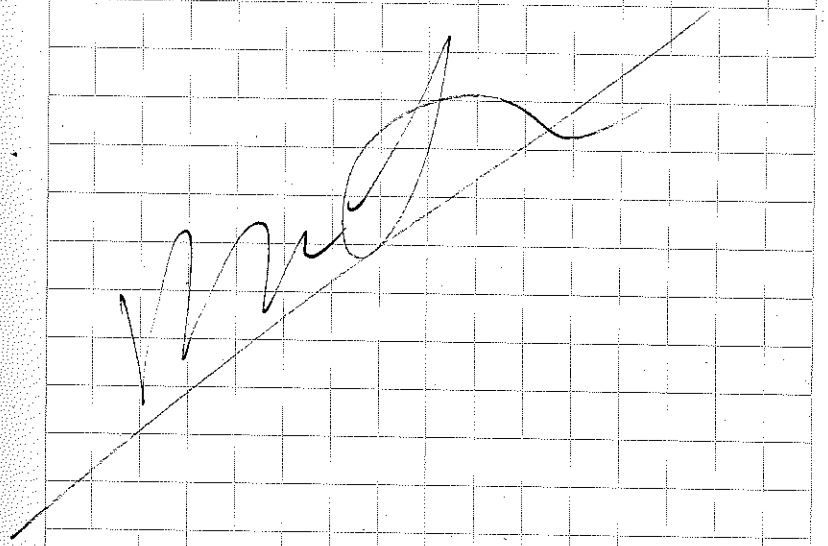
1115 - IDW yard to purge H_2O

1200 - Begin sample management.

1500 - Head to TTI Test America & SGS

1630 - Back on-site. Unload coolers/equip

End of Day



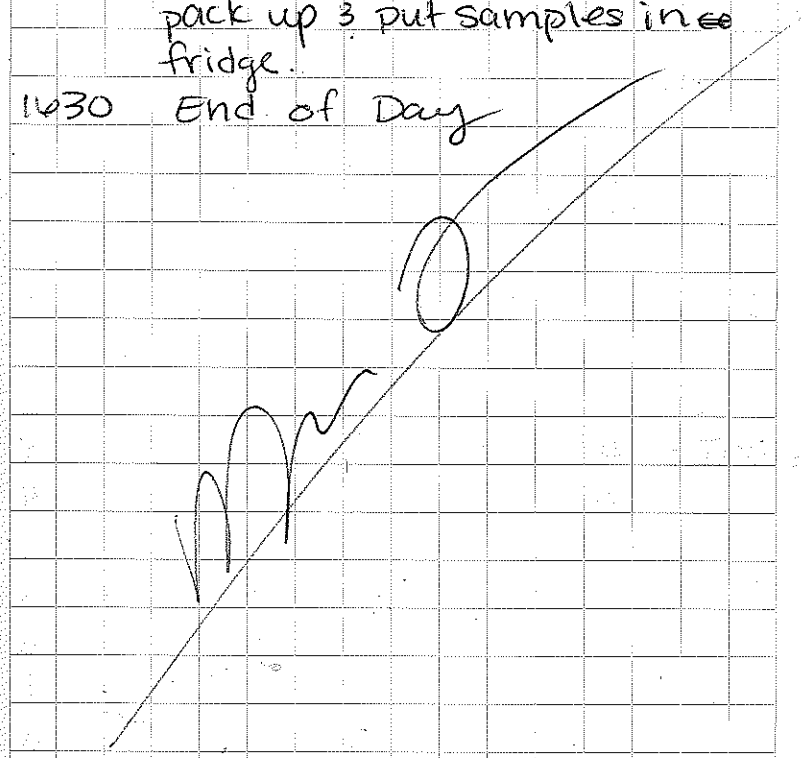
9/16/14

WX: Partly cloudy
Field P.: AT/ML

0700 - At Boniface gate to get ML a temp pass. Base pass was left @ job trailer
0715 - To job trailer to prep for sampling. Will start w/ sediment sample @ Beaver Wetland Treatment cell
900 - Arrive at railyard - WCSD-09
915 - Collected sediment sample for VOC's 8260 and Low Level VOC's
14WTC-WCSD09-SO-01
MS/D + DUP
930 - Head to ST068 to collect GW
1010 - Arrive at ~~ST0~~ 62WL-02R
DTW = 26.82' DTB = 34.60'
1022 - Begin Purge
Volume = 7.78' x 0.16~~8~~ = 127gal
1057 - Collect sample
14ST068-62WL02R-GW-01
DUP & MS/D + AK101 & BTEX
1115 Back to job trailer to freeze sediment samples + meet Dan to discuss GW schedule

SD029

1330 - Arrive at ~~IA~~ 156-01
DTW = 46.99' DTB = 60.15'
Volume = 13.16 x 0.163 = 2.15 gal
~~PH~~ 1348 - Begin purging
~~1355~~ - Collect 14SD029-1S601-GW-0
1458 for VOCs
~~IH~~ 1515 - Head back to job trailer to pack up & put samples in ~~ee~~ fridge.
1630 End of Day



9/19/14

Wx: Raining ~55°F

FP = AT/ML

0730 - Onsite prepping to develop well @ 6539

900 - TO BASE OPS to get flightline access.

930 - Arrive at 539 NDW-01 Set up to develop well. The generator will not start. Tried Plugging the Grunfos into Truck outlet, but pump would only work periodically. Decided to use hurricane pump to develop well.

1000 - Began surging & purging well w/ Hurricane - See MW Development Sheets.

1200 - TO IDW YARD TO Purge water Generated ~ 100 gallons developing the well.

1230 - Back @ Job trailer to unload. Tried starting generator again cleaned spark plug. It still doesn't work. Also tried Grundfos & it tripped the breaker. It will not stay on.

1330 - Continue w/ sample management.

1515 - Head to Labs (SGS/TA) & TTT to deliver samples and return grundfos.

WX: 150, CLOUDY
PERSONNEL: JY/LH

CC639

9/23/14

0730 CALIBRATE YSI

pH 4.01 @ 10C 4.00
= 4.00

pH 7.00 @ 10C 7.06
7.07

ORP @ 240
= 240.3

CONDUCTIVITY @ 10C = 1020
= 1014

DO @ 754.3
99.3%

0900 SET up @ 43WL-09

0924 BEGIN PURGE

0951 14CC539-43WL09-GW-0
DRO, GRO, BTEX

1010 SET up @ 43WL-11

DTW 15.43 1017 BEGIN PURGE

TD: 21.09

10 GAL 14CC539-43WL11-GW-0 AK102,

DUP 14CC539-43WL11-GW-1 AK101, SW8260B

1100 SD7WL-01 BTEX + VOCs

DTW: 16.49 MOD

TD: 21.81 + 8270-MOD

1109 BEGIN PURGE

1130 14CC539-SD7WL01-GW-0

AK102, AK101, SW8260B BTEX +
SW8270-MOD MOD VOCs

1150 DEPART SITE FOR RESTROOM
BREAK

1250 SD7/10-~~01~~

~~DTW~~ DTW: 11-15

TD: 34.90'

1258 BEGIN PURGE SD71001-GW-0

1326 14CC539-SD~~7100~~1-GW-0

AK102, AK101, SW8260B BTEX +
~~MOD VOCs~~

1340 DEPART SITE

1340 BATTERY DEAD IN TRUCK ML JUMPS

1405 ARRIVE @ JOB TRAILER.

LH. DEPARTS SITE. JY - SAMPLE /
EQUIPMENT MAINTENANCE

1530 END OF DAY

CG539

9/24/14

Wx: Clear, cold 30°c

Team: AT/ML

0730 - on site, prep for the day

0815 - Accessing Weston Truck, will not start will try again when it's day warms

830 - TO Base OPS to get flight line access

845 - On site at CG539

850 - @ 507WL-01 to collect grab PAH sample. Pumped for ~ 10min purged 1 gallon - Turbidity @ 8.75 NTU.

900 - Collected grab 14CG539-507WL01-GW-0 for PAH - MOD

915 - Begin at 43WL-11 for grab PAH Purged for 10min ~ 1gal Turbidity @ 8.72 NTU

929 - Collected 14CG539-43WL11-GW-0/-1 for 3 Dup for PAH-MOD.

940 Arrive @ 539MW-01 DTW = 19.62 DTB = 27.12

947 Begin purging well Volume = 7.5 x 0.163 = 1.22 gal

1025 collect 14CG539-539MW01-GW-0 for GRO, BTEX, DRO

CG539

9/24/14

1040 - arrive at 539MW-02 DTW = 5.81' DTB = 13.55 Volume = 7.74 x 0.163 = 1.26 gal

1054 - Begin purging well

1205 - Collect sample 14CG539-539MW02-GW-0 Total Purged ~ 5.5gal. & turbidity was @ 36.7 NTU Sampled for GRO, DRO, BTEX

1320 43WL-12 DTW = 5.30' DTB = ~~&~~ 13.51' Volume = x 0.163 =

1329 - Begin purging

1405 - Collect 14CG539-43WL12-GW-0 DRO, GRO, BTEX

1430 ~~At~~ 43WL-13 DTW = ~~15.46~~ DTB = 18.56' Volume = (MU) → 12.46' ~~x 0.163~~ = Volume = x 0.163 =

1440 - Begin purging

1532 Collect 14CG539-43WL13-GW-0 DRO, GRO, BTEX

1550 - Back to job trailer to demobe & clean up

1700 - END OF DAY

70

9/25/14

WX: Clear, Cold ~30°F

Team: ATML

0715 - Onsite - Trailer is Cold

Cal YSI's

YSI 1899

pH 4.00 @ 0°C reads → 4.00

7.00 @ 0°C reads → 7.00

Conductivity 896 uS/cm @ 5°C reads → 896 uS/cm

ORP 240mV reads 240mV 240.4 mV

% DO reads 114.7 %

YSI 1033

pH 4.00 @ 0°C reads → 4.00

7.11 @ 0°C reads → 7.00

Conductivity 896 uS/cm @ 5°C reads → 896 uS/cm

ORP 240 mV reads 240.4 mV

%DO reads 99.9%

830 - Head to Base OPS

855 - Set up on 43WL-06

DTW = DTB =

Volume =

935 - Collect 14CG539-43WL06-GW-0

for DRO, GRO, BTEX

CG539 2/9/25/14

910 - Set up on 43WL-07

DTW = 15.81 DTB = 22.04

Volume = 6.23 x 0.163 = 1.02 gal

921 - Begin purging w-11

947 - Collect 14CG539-43WL07-GW-0

for GRO, DRO & BTEX

1017 Arrive at 43WL-08

DTW = 16.59 DTB = 23.96

Volume = 16 x 0.163 =

1022 - Begin purging

1039 - Collect sample

14CG539-43WL-08-GW-0

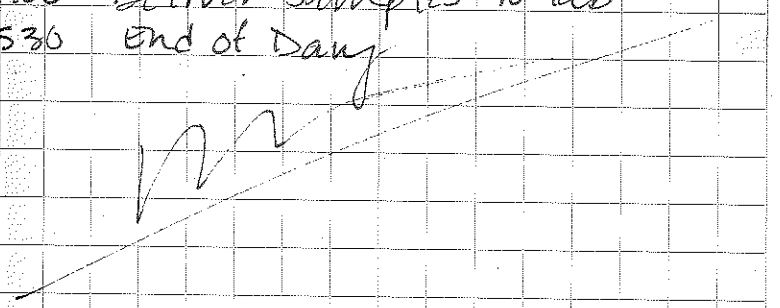
GRO, DRO, BTEX

1100 - Back at job trailer to demobe.

& clean up.

1400 - Deliver samples to lab

1530 End of Day



72

9/29/14 TU091

WX: Clear, cold ~30°F

Team: ML/EB

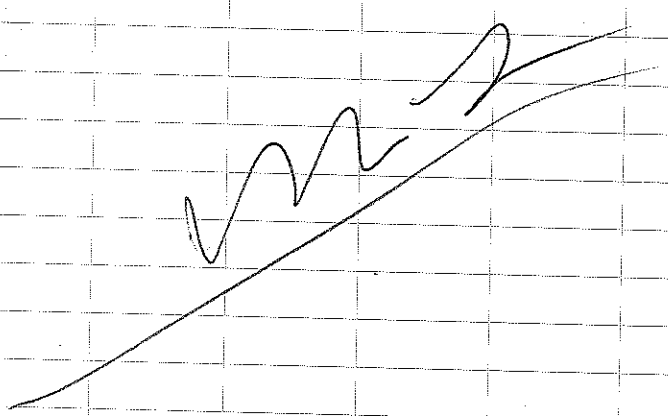
0730- onsite, prep for well development at TU091

930- Arrive at TU091 to begin. See Well Development log for details

1330- Finish at TU091, Back to job trailer.

1400- Go w/ Wendy to LF008

1530- End of Day



TU091 9/30/14 73

WX: Clear, cold ~40°F

Team: ~~Anne~~ AT/ML

0800- To Test America to p/u sample coolers/jars.

0900- Help Wendy @ ORP Contractors Yard to pump water from liner

1400- Back @ job trailer to prep for sampling

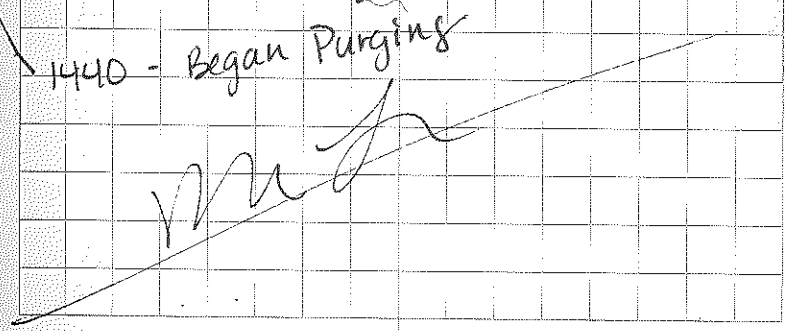
1430- Arrive at TU091MW-01
DTW = 25.35 DTB = 32.89
Volume = 7.54 x0.163 = 1.23gal

1615- Collected sample 14TU091-TU091MW01-GW-0 for PAH, VOC, GRO, EDB, EPH, VPH, DRO/RRO

1706 1700- Back to job trailer to demobe

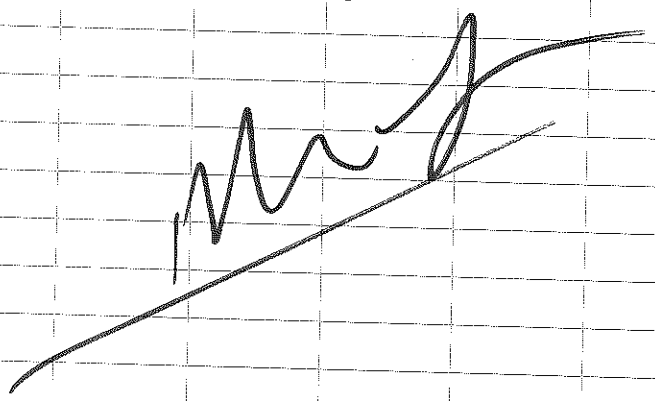
1730- End of Day

1440- Began Purging



10/1/14
WX: Cold, ~25°F - HARD FREEZE!
Team: AT/ML

0830 - onsite to clean & organize site
Sample management, return equip.
pump purge H_2O, deliver samples,
send PT samples via Fed-Ex.
1230 - TO TEST America to deliver
samples.
1400 - Weston office for ST032
meeting
1700 - Back on @ job trailer
Bottle inventory
1730 - End of Day



RIR #350N

To re-order contact
TTT Environmental (907) 770-9041

"Rite in the Rain"®
ALL-WEATHER
FIELD
No. 350N

2014 JBER LTM
GROUNDWATER #2 of 2

9/4/14 to [redacted]

FA8903-CA-D-8519 T.O. 0016

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	Gate/Snowbarn contact	
	753-5511 (3434)-combo	
	Access to 045MW-11	
	Snowbarn Foreman	
	552-2176 (2893)-combo	
	snowbarn 552-5922	
	Plowing	
	Mike Scott Denali Maintenance	
	907-349-2132	

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

ALL-WEATHER
FIELD BOOK

Name _____

Address _____

Phone _____

Project _____

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

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Page Pattern		Cover Options	
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9/4

0730	JY + HH CALIBRATE YSI	YSI 1899
1PH	PH 4.01 @ 20°C = 4.00	4.01
2PH	PH 7.00 @ 20°C ~~7.0~~ 7.01	7.01
	Conduct. @ 16°C = 11.73	1173
	ORP @ 240	240.1
	%D.O. @ 757.8	%99.8

other YSI

PH 4.01 @ 20°C = 4.00	4.00
7.00 @ 20°C = 7.01	7.01
Cond. @ 16°C 11.73	1173
ORP @ 240	240.0
%DO @ 758.2	%99.8

0825 ARRIVE @ MWSMW-~~45~~34
WELL BLOCKED APPROX 1.5' bgs
0845 HEAD BACK TO TRAILER FOR
171 H_2O
* NOTE MWSMW-34
DTW 29.51'
TD 58.35'

0910 ARRIVE @ MWSMW-38
DTW 28.50'
TD 60.05'
START PURGE 0920 TOTAL GAL.
COLLECT DUP & MS/D 5.0

1011 145037-MWSMW38-GW-0
145038-MWSMW38-GW-1
DUP & MS/D
SW8260B

1040 SET UP @ MWSMW-46
DTW 34.09
TD 54.81

1047 BEGIN PURGE
1120 145032-MWSMW46-GW-0
SW8260B
TOTAL GAL PURGED 3.0
1130 STOP @ SHARPETTE FOR
LUNCH / RESTROOM BREAK

1155 403-WL01

1155 403WL-01
DTW: 39.01'
TD: 46.35'

1203 BEGIN PURGE → TOTAL GAL 2.5
1230 14ST037-403WL01-GW-0
SW8260B

1255 SP1-02
DTW: 33.90'
TD: 51.50'

1253 BEGIN PURGE → TOTAL GAL 1.5
1320 14ST037-SP102-GW-0
SW8260B

1345 DU3-MW02
DTW: 20.13
TD: 38.25

1350 BEGIN PURGE → TOTAL GAL 2.50
1421 14ST037-DU3MW02-GW-0
SW8260B

1430 HEAD BACK TO TRAILER LH → TO DEMACT SITE. JY TO PURGE GW H_2O @ IDW YARD
1500 LH DEPARTS SITE
1600 END OF DAY

9/14

9/5

WX: Raining 45°F

Field P.: ME/HL/AT

0730 Calib check I YSI 1038

pH 4.01 @ 20°C = 4.00 → reads 4.02

pH 7.00 @ 20°C = 7.01 → reads 7.00

Conductivity @ 16°C = 1173 → reads 1173

ORP @ 240 reads → 240.1

DO @ ~~253~~ 757.8 reads → 99.2%

0912 OU3MW-11

DTW = 10.35 TD = 25.30

Volume = 14.95 × 0.163 = 2.4

0921 Begin Purge

~~9:38 / 10.42 / 7 / 7.11 / 0.726 / 0.3 / 6.47 / 1670 / 108~~ 4R

0958 Sample 1451037-OU3MW-11 for BTEX

I-Pad issues have to enter data by hand.

*Not all data in i pad

0939 to 7Pb shack to grab G/W sheets.

OU3MW-11

Time	DTW	Volume	Temp	SpEC	DO	PH	ORP	Turb
9:45	10.52	1.5	20°	0.730	0.19	6.44	164.4	2.58
9:48	10.43	2	20.7	0.730	0.16	6.46	160.9	1.97
9:51	10.42	2.2	7.26	0.730	0.18	6.51	158.8	1.25
9:54	10.4	2.4	7.36	0.730	0.21	6.53	156.4	1.16
9:57	10.39	2.5	7.46	0.723	0.22	6.54	154.8	1.55
9:33	9/5/24							
9:42	10.4	1	7.45	0.739	0.3	6.47	161.0	7.22
		.5	7.39	0.78	0.87	6.48	1810	2.08

9/5/2014
GW-4A
1121 DTW=5.29 TD=12.29
Volume = 7 x.0163 = 1.141
1126 Begin Purge = 1126.

1147 Sample Collected.
145T037-GW4A-GW-0
for VOCs SW8260

1216 Head to decon yard to pump purge water.
1240 Done for day.

9/8 ST037
0730 CALIBRATE YSI
pH 4.01 @ 13C = 4.00
= 4.00
pH 7.00 @ 13C = 7.06
= 7.04
~~pH~~ COND @ 15C = 1.147
= 1170
ORP @ 240
= 239.4
% DO @ 757.2
= 10.45 mg/L = 100%
0830 ARRIVE @ OU5MW-07
SY / ETC
DTW: 31.69
TD: 49.39
0837 BEGIN PURGING
0940 SET UP @ OU5MW-06
DTW: 33.79
TD: 48.50
0948 BEGIN PURGE
1031 145T037-OU5MW06-GW-0
SW8260B

0916 COLLECT
145T037-OU5MW07-GW-0
SW8260B

ST037 9/8

1045 HEAD BACK TO TRAILER TO SWAP OUT PUMP REGULATOR AND GET LUNCH.

1100 HEAD OVER TO OUSMW-08

1115 OUSMW-08

DTW: 16.31'

TD: 22.02'

1122 BEGIN PURGE

1176 14ST037-OUSMW08-GW-0 ½

DUP MS/D 14ST037-OUSMW08-GW-1

SW8260B

1205 HEAD BACK TO TRAILER FOR BATTERIES FOR YSI

1215 HEAD OVER TO CHECK IN ½ SEE IF WE CAN ACCESS OUSMW-44

1255 OUSMW-15

DTW: 10.61'

TD: 14.52'

1312 BEGIN PURGE

1336 14ST037-OUSMW15-GW-0

SW8260B

1345 PACK UP MUD RETURN TO B5250 TO SEE IF JOHN ROSE IS AVAILABLE TO VET US

ST037 9/8

IN TO THE JUNKYARD FOR OUSMW-44.

1415 OUSMW-44

DTW: 29.05'

TD: 41.88'

1424 BEGIN PURGE

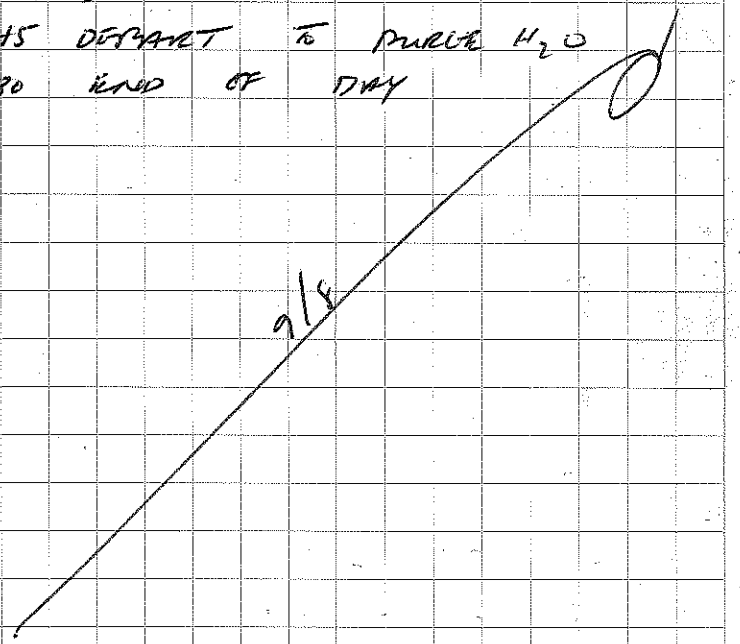
1511 14ST037-OUSMW44-GW-0

SW8260B

1530 RETURN TO TRAILER TO UNLOAD

1545 DEPART TO PURGE H_2O

1630 END OF DAY



9/9 5T037 SEEPS / SURFACE H_2O

0730 TAILGATE

WEATHER: ~45, RAINY

PERSONNEL: JY/LH

0800 HEAD TO RAILYARD. ALL SAMPLES ANALYZED FOR SW8260B AND SW8270C SIM UNLESS OTHERWISE NOTED

0832 | 14ST037-OUSSP11-SP-0 VOCs/PAH

0839 14ST037-OUSSP10-SP-0 VOCs/PAH

0846 14ST037-OUSSP09-SP-0 VOCs/PAH

0851 14ST037-WCSW03-SW-0

0910 14ST037-WCSW02-SW-0

0910 14ST037-WCSW02-SW-1 (DUP)

0918 14ST037-WCSW04-SW-0

0923 14ST037-OUSSP17-SP-0

0930 14ST037-OUSSP18-SP-0

0947 14ST037-OUSSP07-SP-0

MS/D SW8270C SIM ONLY

1010 14ST037-OUSSP03-SP-0

1022 14ST037-OUSSP15-SP-0

x1 1L SW8270C SIM

x3 40mL SW8260B

BAILER DROPPED DOWN WELL

1041 14ST037-OUSCP01-SP-0

1044 14ST037-OUSCP02-SP-0

1055 14ST037-OUSSP02-SP-0

1057 14ST037-OUSSP01-SP-0

1156 14ST037-BPSW01-SW-0

MS/D

1156 14ST037-BPSW01-SW-1 (DUP)

1208 14ST037-BPSW04-SW-0

1211 14ST037-BPSW05-SW-0

1230 14ST037-SC08-SW-0

1247 14ST037-BPSW03-SW-0

1321 14ST037-SC13-SW-0

1330 RETURN TO TRAILER FOR SAMPLE MANAGEMENT

1600 END OF DAY

9/9

16

9/15/14

WX RAINING · 50°F

FIELD PERSONNEL: ML / HC

0730 CAL CHECK YSI 1038 @ 14.7°C

	CONFIDENCE SOLUTION	METER
SPCOND	7.6 - 7.97 mS/cm	7.658 mS/cm
ORP	229 - 261 mV	238.9 mV
pH	6.8 - 7.2	7.12

NO NEED TO RECALIBRATE

0745: LOAD GEAR AND EQUIPMENT INTO TRUCK

0805: DEPART TRAILER FOR FIRST SAMPLING SITE

0820: ARRIVE AT LF59MW-02

DTW = 15.81' DTB = 26.57'

Volume = 10.76 ~~x0.163~~ x.653 = 7.03 gal

0832 BEGIN PUMPING / PURGING

850 - collect 14LF059-LF59MW02-GW-0/1 FOR VOCs + Dup & MS/D

0910 DEPART LF59MW-02

0925 ARRIVE AT BASE OPS TO GET PERMISSION TO ENTER FLIGHTLINE TO SAMPLE ST302 - 59WL-36R

BASE OPS # 552 2107, GATE CODE - 4442

9/15/14

17

0945 ARRIVE AT ST302/59WL-36R

59WL-36R

DTW = 29.76' DTB = 40.53

Volume = ~~29.76~~ (ML) 10.77' x0.163 = 1.76 gal

959 - Begin purging well

1033 COLLECT 14ST032-59WL36R-GW-0/1 FOR 6020 TOTAL LEAD AND DISSOLVED LEAD

1050 DEPART 59WL-36R → DUP

1057 Arrive at 044MW-08R

DTW = 29.~~76~~ (ML) 20' DTB = 43.25

Volume = 14.05 x0.163 = 2.29 gal

1105 Begin purging well

1134 Collect sample

14SD025-044MW8R-GW-0

for SW 8260 BTEX

1155 DEPART MW-08R BACK TO TRAILER FOR LUNCH

1225 DEPART TRAILER

1240 ARRIVE AT ST41-25

DTW = 3.47' DTB = 13.67'

Volume = 10.2 x0.163 = 1.66 gal

1251 Begin purging well

1315 Collect 14ST041-ST4125-GW-0

for SW8260 VOCs

* an unmeasureable amount of product.

9/15 ML/HG

1338 Arrive at well ST41-16
PTW = 16.31' DTB = 22.37'
Volume = 6.06 x 0.163 = 0.99 gal.
DT-Product 16.28' so ~0.03" of product. Heavy odor
1350 Begin purging
1432 Collect 14ST041-ST4116-GW-0 for VOC's - SW8260
Clean/pack up 3 Head by back to trailer to demobe/pickup trash pump
1505 Head to IDW yard purged H_2O
1530 - Back at trailer to unload
1545 - Head to TT & AK Pure H_2O OFF SITE

9/16 DP98 JY/LH
1730 CAL CHECK YSIs WX: 50
ID @ 1899
pH 4.01 @ 15C = 4.00
4.00 4.00
pH 7.00 @ 15C = 7.01
7.01 7.01
ORP @ 240 MV
242.1 239.9
CONDUCTIVITY @ 15C 1147
1147 1147
% H2O @ 751.3 @ 751.2
98.8 % 98.8 %
0815 HEAD UP TO DP098
0835 CHECK IN W FRONT
0840 SET UP @ 41755WL-07
DTW: 6.71
TD: 7.60
0850 BEGIN PURGE
0946 14 DP098-41755WL07-GW-0
X3 40 ML VOC SW8260B
1000 SET UP @ 41855WL-09
1010 BEGIN PURGE
1136 14 DP098-41755WL09-GW-0

20 9/16/14

1100 SET up @ 41755WL-05

DTW 14.67

Total Depth 26.51

1105 BEGIN PURGE

1130 14DP098-41755WL05-GW-0

14DP098-41755WL05-GW-1

SW# 2600 15

1145 RUN TO POD FOR RESTROOM BREAK

1215 41755-WL-04

DTW: 17.~~07~~ 70'

TD: 33.28'

1225 BEGIN PURGE SW# 2600 15

1252 14DP098-~~4155~~ 41755WL04-GW-0

1300 DP98-INJ2

DTW: 14.72 · TD: 30'

SET up @ DP98-INJ2 TO PURGE DRY. WELL HISTORICALLY GOES DRY & DOES NOT RESPOND TO LOW FLOW SAMPLING. WILL GRAB SAMPLE 9/17

1323 PURGE DRY ± 6 GALLONS

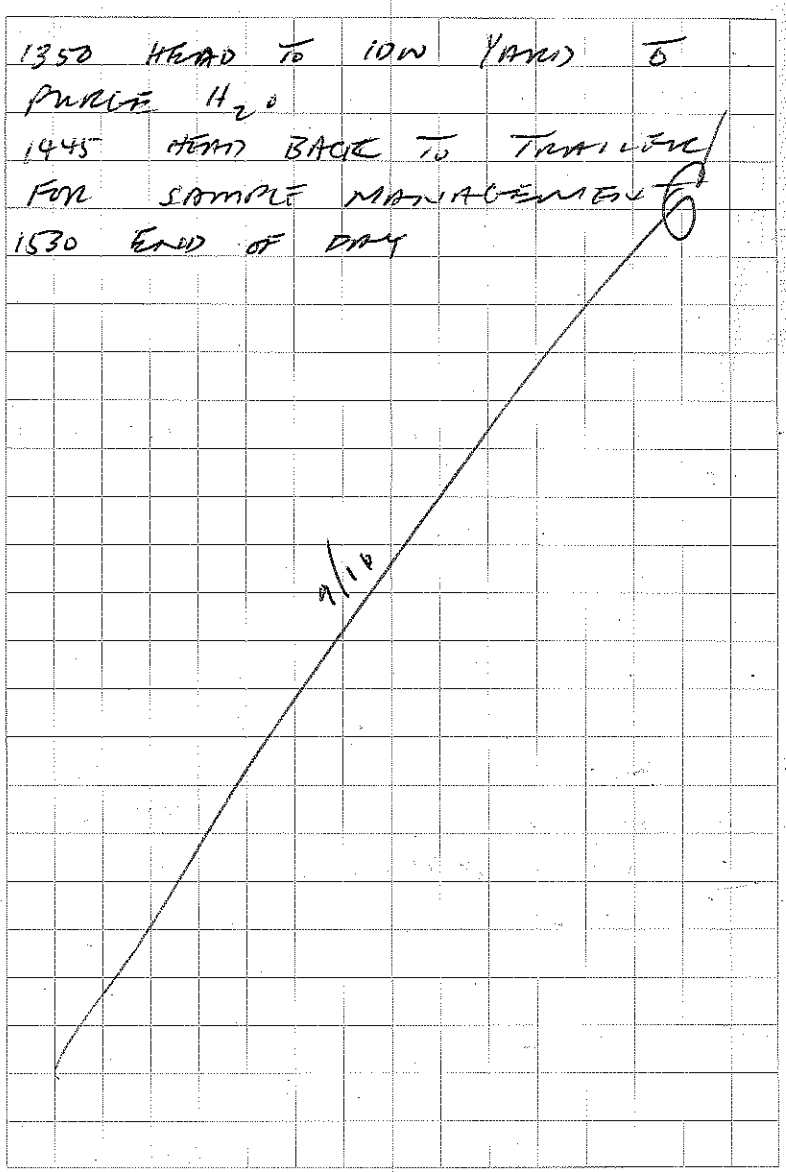
1330 HEAD BACK TO TRAILER

9/16/14 21

1350 HEAD TO IDW YARD TO PURGE H_2O

1445 HEAD BACK TO TRAILER FOR SAMPLE MANAGEMENT

1530 END OF DAY



9/17/14

0730: ARRIVE AT FIELD TRAILER
WX: 50°F OVERCAST LIGHT DRIZZLE
FIELD P: ML/HG/AT
0745: YSI CAL CHECK

PARAMETER	COMPARABLE SOL	READING
SP COND	7630 - 7970	7750 mS/cm
ORP	229 - 261	237 mV ✓
pH	6.8 - 7.2	7.09

CALIBRATION OKAY - NO RECALIBRATION NECESSARY

0815: YSI CAL CHECK #1899

PARAMETER	COMPARABLE SOL.	READING
SP COND	7630 - 7970	3913 mS/cm
ORP	222-252	224.6 mV
pH	6.8 - 7.2	7.15

RE CALIBRATION NEEDED
pH 4.00 @ 18°C = 4.00
pH 7.02 @ 18°C = 7.02
SP COND 1225 @ 18°C = 1225
ORP 240 mV @ 18°C = 240.0
DO% @ 18°C = 98%

900 - Arrive @ DP098 gate to gain access.
930 - Begin to set up on wells 41755WL-02 & 41755WL-03 Will sample both at same time

934 Begin purging 41755WL-02
DTW = 7.93 DTB = 19.51
Volume = 1.9 gal
951 - Begin purging 41755WL-03
DTW = 7.03 DTB = 29.13
Volume = 4.02 gal
Well water is super nasty. Strong HC odor & viscous
DT Product = 7.02' ~ 0.01' of product in well.
Pump has stopped working twice; GW is blocking pump
Will bail out 3 well volumes w/ bailer & sample
1050 Collect sample 14DP098-P41755WL03-GW-0 for VOCs
1055 Collect 14DP098-41755WL02-GW-0 for VOCs
1115 - Head back to trailer to p/u Hunter, $ Lunch & drop some equipment.
1245 - Back onsite at DP098

9/17/14

1300 - Collect GRAB sample from DP98 INJ-02
14DP098-DP98INJ02-GW-0 for VOC's
Proceeding to sample the 3 ~~seeps~~ surface water next.

1315 Collect SW sample
14DP098-DP98SW-10 for VOC's -SW-0

1325 Collect SW sample
14PP098-DP98SW-03 for VOC's -SW-0

1350 Collect SW sample
14DP098-DP98SW-~~01~~ for VOC's -SW-0

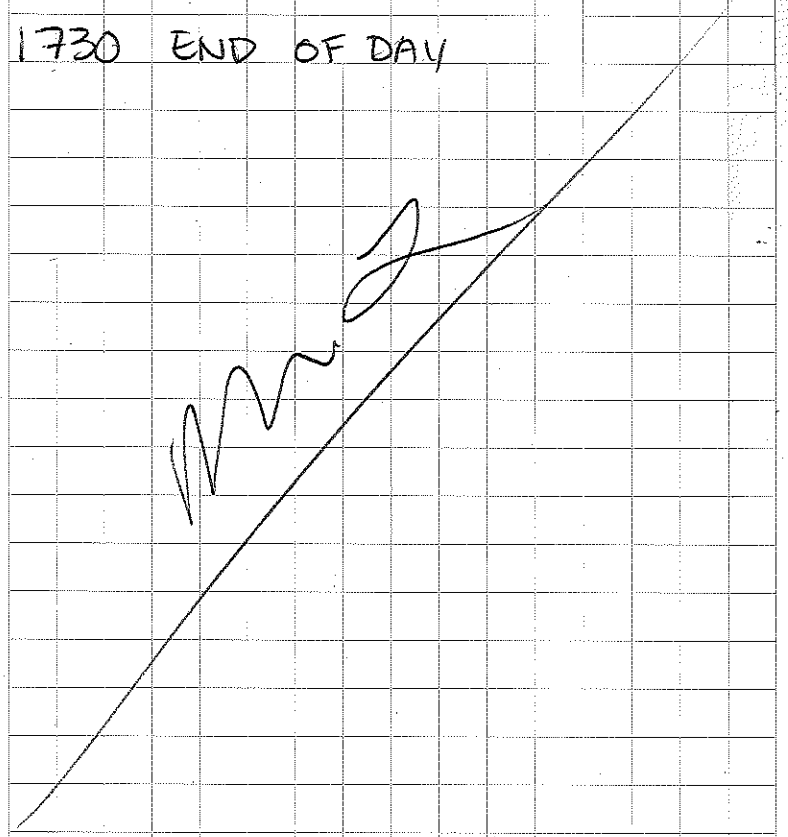
1430 - Prep to ~~to~~ sample
41755WL-08
DTW= 3.50 DTB= 11.44
Volume = ~~#~~ 7.94 x 0.163 = 1.29gal

1544 Begin Purging
Exceed well draw down of 0.33
Will purge 3 well volumes & then sample.

1630 - Collect GW Sample
14DP098-41755WL08-GW-0 for VOC's

1700 - Back at job trailer to demobe.

1730 END OF DAY



9/18/14

WX: Cloudy

Field Team: AT/ML

0745 - Arrive on site & enter info to iPAD

900 - Load equip & head to warehouse to thoroughly clean sample equip. DP098 wells were very gross & equip. is gummed up. Also ~~dump~~ purging water from tank @ IDW yard.

1130 - Back on base. Head to Base Ops to discuss CG539 & todays sampling

1300 - Prep to collect Equipment Blank for voc's. Pump has been cleaned and well pump DI water from clean 1gal jug to sample vials
*Plan to wait after sampling to do equipment blank after Triple Rinse

1310 - Arrive at GW-5A
DTW = ~~49.9~~ mL 40.59 DTB = 49.90

1354 Collect 14FT023-GW5A-GW-0 for VOCs
Triple rinsed pump

1410 ~~1400~~ mL - Collect Equip Blank 14JBER-LTMEQUIP-EB-0 for VOC's

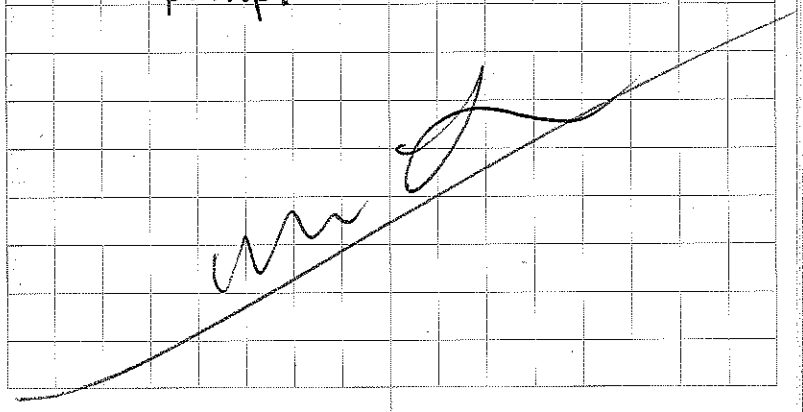
1421 OU4W-11 43.93 57.80
DTW = ~~34.93~~ mL DTB = ~~43.93~~
Volume = 13.87 x 0.163 = 2.26
Black junk/flecks in well

1450 Collect GW sample 14FT023-OU4W11-GW-0/-1 for VOC's DUP & MS/D

1505 - Head to IDW yard to Purge GW

1545 Back at job trailer to unload.

1600 - Head to TTT to get Grundfos pump.



CG539

9/22/14

WX: Clear, cold ~ 35°F

Team: ML/EB

0730 - onsite

Cal YSI's - Load Equip

YSI 1896

pH @ 4.00 reading 4.00 / @ 7.08 reading 7.10

Conductivity @ 5°C 8.96 - reads 896

ORP @ 25°C 240 reads 240 241.9

%DO reads 98.1

YSI 1038

pH @ 4.00 reading 4.00 / @ 7.08 reading 7.08

Conductivity @ 5°C 8.96 - reads 896

ORP @ 25° 240 reads reads 240.0

%DO reads 98.1

0830 - Head to Base Ops to get flight line access

0920 Begin gauging all the CG539 wells

1200 - TO job trailer / Lunch

1230 - Back at CG539. Prep to develop CG539MW-02

Alternated between surging & purging.

See Well Dev. Forms

WATER LEVEL GAUGING

TIME	WELL	DTW (+/-)	DTB (+/-)	NOTES
0924	43WL-09	18.19	25.4	no tubing, pulled out & level log.
0950	SP7/10-01	11.14	34.88	NO TUBE
1002	539MW-01	19.63	~~37~~ 36 37.81	TUBING
1020	43WL-02	18.86	29.22	NO TUBING
1030	539MW-02	5.72	13.57	TUBING
1038	507WL-01	16.42	21.82	NO TUBING
1043	43WL-11	15.37	21.14	TUBING
1059	43WL-13	12.41	18.56	NO TUBING
1108	SP7/10-04	16.20	28.59	TUBING
1116	W-3	17.89	34.85	NO TUBING
	↳ Depth to Product = 17.32' (0.57' thick)			remove level log
1127	43WL-06	13.64	18.19'	NO TUBING
1133	43WL-07	15.71	22.64	remove level log / TUBING
1140	43WL-14	17.11	24.54	NO TUBING
1149	43WL-08	16.51	23.96	NO TUBING

25 35 30 22 19 35 18 25 24 233

@539MW-02 Development

Bottom interval = 13.5 - 11.5'

middle interval = 10.0' - 8.0'

Top interval = 6.0' - 4.0'

1600 - Finish Developing well. Back to trailer.

1630 - To TTT to get tubing

OFF SITE

CG539

9/23/14

Wx: Partly cloudy ~45°F

Team: ML/AT

0730- Onsite prepping for the day.

0815- TO Base OPS to get Flightline access

0845- TO IDW YARD TO PURCHASE H_2O

0930- Arrive at W-3 for bail down test. Collect product (DTP) & water (DTW) depth

1000 - Bail product from well.

1014 - stop bailing & begin depth measurements. Removed almost all product. Thin layer in bailer

1115 Proceeded to SP7/10-04 to sample while waiting for product recharge

SP7/10-04

DTW = 16.18 DTB = 28.59

1155 Collect GW sample

@ 14CG539-SP71004-GW-0

for SW8260-VOC's (modified)

@ SW8270-mod, AK101 & AK102

also MS/D

10
4.5
30

CG539

9/23/14

W-3 Bail-Down test

DTP = 17.33' DTW = 17.88

Product Thickness = 0.55'

Time	DTP	DTW	NOTES
AFTER BAIL (1014)	NO PRODUCT DETECTED	17.43	Product not detected
30 sec	–	17.45	" " "
1 min	–	17.44	" " "
2 min	–	17.44	" " "
5 min	–	17.44	" " "
10 min	17.44	17.47	
20 min	17.43	17.49	
30 min	17.43	17.50	
45 min	17.43	17.50	
60 min	17.43	17.50	
120 min	17.42	17.49	
195 ~~180~~ 180 min	17.41	17.49	
270 min	17.40	17.48	
335 min	17.41	17.48	

START READING = 1014

STOPPED READING = 1551

9/23/14 CG539

1335 - Set up on well 43WL-14
DTW = 17.12 DTMB = 24.54

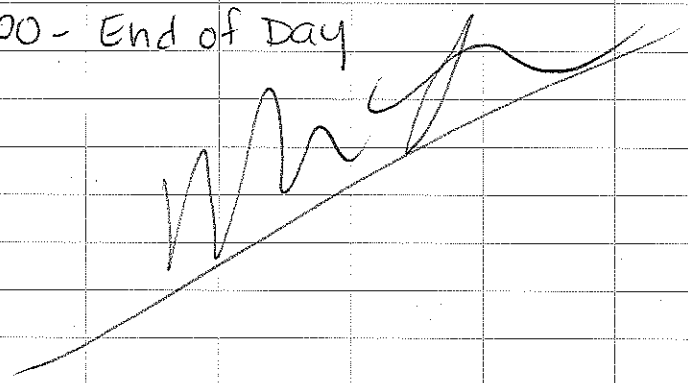
1414 Collect sample & Duplicate
14CG539-43WL14-GW-0/1
VOC's, PAH, GRO, DRO

1452 - Set up on 43WL-02
DTW = 18.87 DTB = 29.22

1535 - Collect GW sample
14CG539-43WL02-GW-0
for GRO, DRO, BTEX

1551 - Collected final measurement at W-3. Head back to trailer to unload.

1700 - End of Day



LFOS

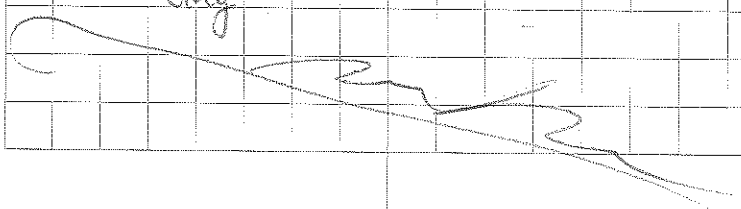
10/7/2014
Wx: Clear, Sunny 16°
Team: AT/HG

0800 - Onsite preparing for the day.
0900 - At LFOSGW-1A for GW sampling.
1015 - Collect Sample LFOSGW-1A-14-0
1115 At LFOSMW-15R prep for sampling.
1217 Collect Sample LFOSMW-15R-14-0

1240 Break for lunch snack
1345 At LFOSMW-16
1444 - Collect sample LFOSMW-16-14-0

1540 At LFOSMW-17 well for sampling

1546 Collect sample
1630 At trailer cleanup / done for day



10/8/2014 LF05

Team: AT/HG: team

Wx: 27°, Clear.

745 Return interface probe to TTT for a new one. Probe malfunctioned on 10/7.

820 On site, Prep for day.

840 At well LF05MW-18.
Unable to get pump down well, assuming tubing is down well. Fish for tubing.

950 Fishing for tubing unsuccessful. Move on to next well.

1000 At Well LF05W-06
Set up sample equipment

1048 Sample LF05W-06-144-0
MS/MSD.

1206 At LF05MW-10

1230 Pump issues, troubleshoot.
Call TTT, use new spare pump.

1325 Sample LF05MW-10-144-0.

1453 ~~Collect sample At~~ At well LF05GW-2B, collect sample LF05GW-2B-144-0.

1510 to Decon yard to pump purge water.

1530 Pump broken.

1545 Unload truck, find new trash pump.

1600 to Decon yard to pump Purge water

1630 to Connex. Start COC.

1730 Done for day.

LFO5

10/9/2014
team AT / HG
Wx: Partly Cloudy, 27°

0800 Onsite Calibrate YSI - HG
pH 4.00 @ 20°C = 4.00 reads 4.00
pH 7.00 @ 20°C = 6.98 - reads 703
Cond. 16°C = 1122 - reads 1147
ORP @ 240 = 257.6 reads 240
DO% @ 11% calibrate reads 98.3%

0805 AK picks up PT sample from weston office
Pack up for sampling.

0845 At well OU1LF-19 for sampling

1004 Collect sample OU1LF-19-144-0

1030 At well LFO5MW-18 to retrieve well tubing.

11:30 Unable to retrieve tubing its appx 10-12 feet deep.

1230 Purchase ~~Magnets~~ supplies for retrieval. Unable to retrieve tubing → HG

1300 AK Work on COCs and

LFO5

cont: 1300. Sample management.

1340 take samples to test America. Drop sample equipment at TIT.

1630 Pump purge water at decon yard. Clean Rental truck.

1700 Send emails - end of day.

- PT sample = LFO5MW-25-144-2

10/15/2014
Team: AT/ML
Wx: Partly Cloudy 30°C

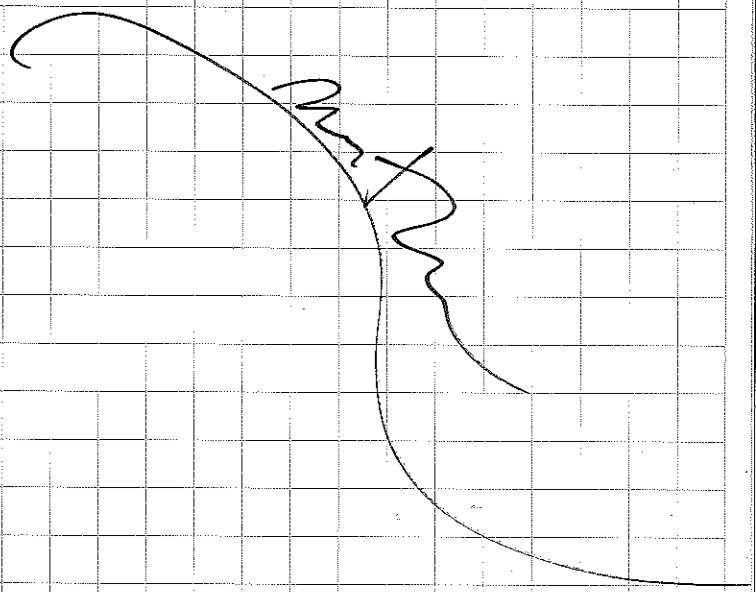
8:00 At site prep for PDB drops.
830 Arrive at OU5MW-14. Discover we need zip ties to make frozen fingers work easier → to AH
900 - Back at well
920 - Deploy PDB @ OU5MW-14
Move to next well
925 - Arrive at OU5MW-13
930 - Drop PDB in OU5MW-13
939 Drop PDB in OU5MW-12
957 Drop PDB in OU5MW-33
1007 Drop PDB in OU5MW-31
1017 Drop PDB in NS3-2
1025 Try to drop PDB in OU5MW-10 but need a 1' PDB due to shortness of sat. screen intervay
1040 - Back job trailer, Call Lance no answer, use restroom
1128 Drop PDB in OU5MW-11

1157 Drop PDB @ 516MW-02
Well tag needs new lock
1220 - Attempt to drop PDB in OU5MW-46 which was to replace OU5MW-01. Cant use tether from OU5MW-01 (its severed) for PDB deployment in -46
Need to order tether/weight
1308 - Drop PDB in OU5MW-45
1331 - Drop PDB in SP2/6-05
1339 - Drop PDB in 401WL-03
1346 - Drop PDB in 401WL-04
1410 - Drop PDB in OU5MW-09
1420 - Drop PDB in OU5MW-05
1445 - Drop PDB in SP4/1+03
1450 - Back @ truck. Looking for a well Lance needs gauged.
1545 - Measure GW elevation
LFOSMW-13
DTW = 12.97'
1610 - Back at job trailer to clean out truck & end day
1630 - End of Day

10/22/2014 ST032
team AT/SJ/HL
Wx. Partly Cloudy. 20°c

0800 Arrive at job shack. Leave to retrieve rental truck @ Delta leasing.
0900 Anne to SGS pick up sample Bottles.
Serena to Test America to pick up sample bottles.
10:00 At Job trailer prep for development well & sample
11:00 At ST59WL-47, set up to develop.
11:30 Hunter Arrive.
1157 Start development.
1257 Done development. 3 feet of water still in well, pump unable to pump last water. Will use Bailer to bail Dry.
1430 At ST59WL-47. Use Bailer.
1505 Move to 59WL-23 for sampling
DTW: 34.18 ft
TD: 43.80 ft

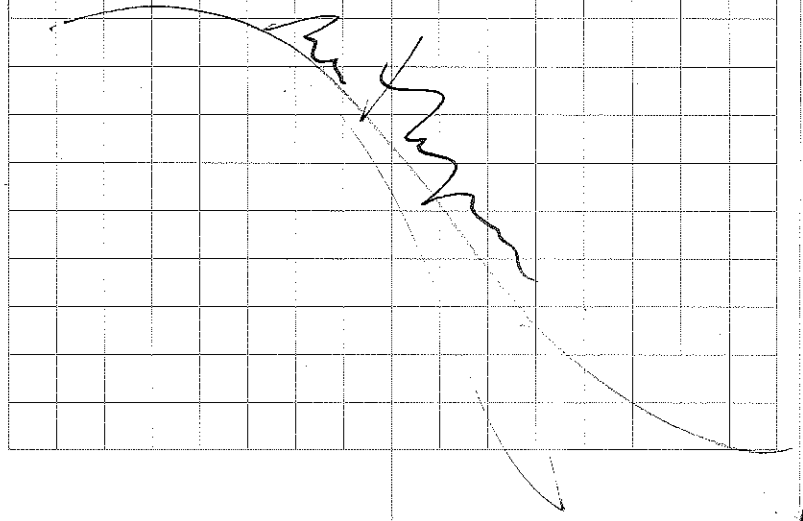
10/22/2014 ST032
Cont: 59WL-47
1345 Purge start
1609 Stop purge
1610 Sample 14ST032-59WL23-GW-0 and dup 14ST032-59WL23-GW-1
1715 At job shack. Demob for the day.
1630 Sample labels - start COC for samples.
End of Day



10/23/2014 St032
Team: AT/JR
Wx: Sonny, 16°C

830 At Job shack - JR. Search for AT wallet.
930 Meet AT at Boniface gate. bring AT on Base. Wallet found on Base
10:00 Prep for water sample
10:30 At 59WL-01R well. Well is 3/4 inch. not able to sample. 15 feet of water.
11:00 To Vault 6 St032. find well 59WL-17 Unable to locate Biovent 600C found but no well.
11:50 Depart to drop PDB bags.
12:30 Cinches: TDW @ OU5MW-10 4.8 :TD
Deploy PDB Bag.
1245 Go to Office for paperwork.
1330 At OU5MW-410 drop rope i weight for PDB.

1400 At 59WL-47 prep for sampling.
1440 DTW: 39.19
TD: 45.35
1449 Start Purge.
1510 Well Ran dry. Not able to sample. Will sample 10/23.
1530 To Job shack for Unload truck. prep for sampling tomorrow.
1600 Create COCs, & Label bottles, Pack coolers.
1800 Done for day.



11/4/2014 LF04
Team: HG/AT
Weather: 25°F, sunny, clear
1140 At well 006MW-67.
DTW: 64.29
TD: 87.20
1202 Begin purge.
1235 Collect sample
14WP014-006MW67-GW-0 for
VOCs, → MS/MSD
1249 At well 006MW-93
DTW: 54.07
TD: 65.51
1256 Begin Purge.
1355 Collect sample:
14WP014-006MW93-GW-0
for VOCs & 14WP014-006MW93-GW-1
1430 At well 006MW-92
DTW: 32.80
TD: 39.74
1440 Begin purge.
1511 Well ran dry. Will sample
on 11/5/2014.
1600 At work trailer, unpack truck
end of the day.

10/5/2014
Team: SJ/AT
Weather: 30°F, Partly Cloudy.
0700 At JDD trailer. Start packing
coolers and creating COCs.
0800 Pack truck for GW samplings.
0830 At 006MW-92
TDW: 32.82
TD 39.74
0837 Sample: 006
14WP014-006MW92-GW-0
Well Ran dry yesterday. so
did not wait for stabilization.
0900 At field trailer, unpack
truck, create COC for
SGS. Send SJ to TTT
and TA for sample &
equipment drop off.
1045 Sampled dropped off & equipment.
Done for day.

FT023

10/7/2014

WX: Cloudy, 30°F

team: AT / HL

10:00 At field trailer. prep to drop data loggers.

10:20 GO by base OPS. alert to us being on flight line.

11:00 At FT023.

FT023

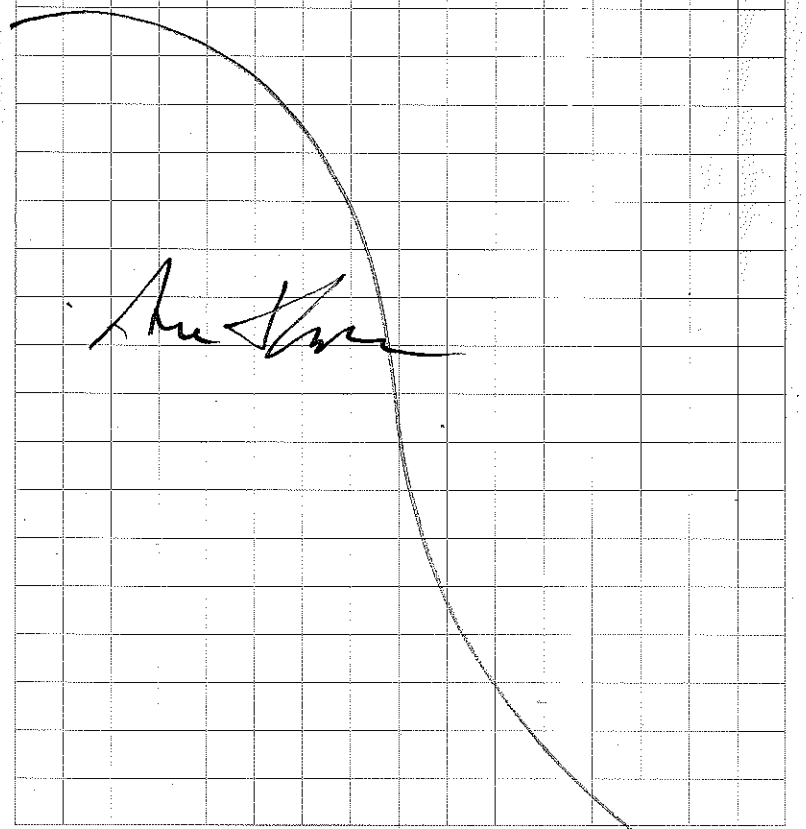
Well	Logger ID	DTW	TD	Time
GW-5A	01120197 40	41.02	53.94	11:22
GW-5A	00120203 48 Barologer	Deployed	at	11:39
407MW-01	none	37.73	45.93	11:45
OU4W-11	01120197 22	44.0	57.51	11:53
		Deployed	at	1203
FP-52	none 4" well	40.13	51.94 30	12:19
FP-56	01120197 29 4" well	39.61 Deployed at.	49.22 @	12:32 12:39

FT023

1400 Done at FT023. HL will try to find a better cap for the 4 inch well FP-56

1600 Hunter found better cap. Deployed cap.

1200 Done for day



11/12/2014 ST037 PDBs

Wx: Cloudy, 37°F

team: AT/SJ

0800 SJ at Job trailer, prep for day of sampling PDBs.

0904 Collect 14ST037-OU5MW10-GW-0 only collect 2 VOAs. limited volume of water in PDB

0925 Collect OU5MW-14 PDB.

0940 Collect OU5MW-13 PDB. -DUP

0955 Collect OU5MW-12 PDB.

1022 Collect SP2605 PDB -MS/MSD

1055 Collect OU5MW-46

1115 Collect OU5MW-45 - DUP

1130 SJ Depart for day, HC arrive.

1150 Collect 401WL-03

1241 Collect 401WL-04

1255 Collect OU5MW-11

1339 Collect OU5MW-33

1355 Collect OU5MW-31

1406 Collect NS3-2

1418 Collect OU5MW-09

1434 Collect S16MW-02

1501 Collect SP4/11-03

1530 to field trailer for sample management, & clean up.

→ AT 1310 Collect Sample OU5MW-05

Location LF004 Debris Survey Date 9/8/14

Project / Client

Wx Partly Cloudy / rainy
Personnel: Aaron, Moana, Tracy

0730 - Met at job trailer, Coordinated efforts for the day.
0830 - Call port to set up access
0930 - Arrive at Northern end of Port to begin debris survey.
1130 Completed debris p/u. There wasn't much to clean up. Made ~~pi~~ piles along bluff. GPS not responding - Trimble was not able to p/u a signal
1215 - To office to get Garmin & p/u a tarp for debris.

1245 Begin survey (w/ Garmin) of debris piles
~~1490~~
1400 Finish GPS & loading all debris Head to landfill ~~for~~ debris disposal.

Location LF004 Debris Date 9/8/14

Project / Client

Scale

Items

~~Photo~~ ML

~~#1 - concrete block~~

#1 Concrete block, rusted metals & glass
1250pm 61° 15' 18.7" N
149° 52' 48.5" W

#2 Metal debris & pottery
61° 15' 17.9" N
149° 52' 48.8" W

#3 Long metal rod, glass & metal bits & pieces
61° 15' 14.0" N
149° 52' 46.3" W

#4 Small concrete pieces, burnt paper glass & metal pieces
61° 15' 5.4" N
149° 52' 44.7" W

#5 3' Thick x 30' band of burnt debris located w 12' from toe of slope, ~~along~~ along the ~~bluff~~. Looks
61° 15' 4.9" N
149° 52' 44.3" W

#6 Metal plate, debris. Broken glass
61° 15' 4.1" N 149° 52' 44.8" W

Location LF004 Debris Survey Date 9/8/14

Project / Client

#7 Concrete blocks, a bowl, glasse bottles & broken glass
61° 15' 3.4" N
149° 52' 44.9" W

#8 Bricks, concrete chunks, metal & glass bottles
61° 15' 2.5" N
149° 52' 44.5" W

#9 Concrete Block ~ 3' x 2' (Pillar)
61° 15' 1.9" N
149° 52' 44.6" W

Location CG535 & PH578 Date 9/15/14

Project / Client AFCEC

Scale

Personnel: Kevin Meske (medic) / Weather: 50's & rain — AK
Objective: Monitoring well decommissioning 630 elevation onsite. Load site vehicle — KM
7:15 Depart field trailer. — KM
7:25 AK Base Ops checking in and confirming we could decommission wells on the flightline with the weather. — AK
7:30 Base Ops (flightline manager) doesn't want us on the flightline now because of the weather. Possibly later. — KM
7:35 Meet Glen Rawson and Logan Hermans (Geotek) at the PH578 gate. They have a 8040 Geoprobe and a support truck. — KM
7:40 Depart CG535. — KM
7:45 Arrive at CG535. Health and safety meeting. — KM
7:55 Monitoring well 576 MW-04 does not exist. We cannot be able to decommission it. — KM

Photograph 1

Description: Concrete Pillar Debris **Date: 9/8/14**
Latitude: 61°15'1.9" N, Longitude: 149°52'44.6" W

Photograph 2

Description: Piping, glass and Metal Debris **Date: 9/8/14**
Latitude: 61°15'14.0" N, Longitude: 149°52'46.3" W

Photograph 3

Description: Exposed Drums Along the Bluff **Date: 9/8/14**

Photograph 4

Description: Metal Debris **Date: 9/8/14**
Latitude: 61°15'17.9" N, Longitude: 149°52'48.8" W

Photograph 5

Description: Metal Debris and Broken Glass **Date: 9/8/14**
Latitude: 61°15'4.19" N, Longitude: 149°52'44.8" W

Photograph 6

Description: Burnt Debris in Side of Bluff (Approx. 3' x 30') **Date: 9/8/14**
Latitude: 61°15'4.9" N, Longitude: 149°52'44.3" W

Photograph 7

Description: Concrete, Metal and Glass Debris **Date: 9/8/14**
Latitude: 61°15'5.4" N, Longitude: 149°52'44.7" W

Photograph 8

Description: Concrete Block, Pottery and Glass **Date: 9/8/14**
Latitude: 61°15'3.4" N, Longitude: 149°52'44.9" W

Photograph 9

Description: Concrete and Glass Debris **Date: 9/8/14**
Latitude: 61°15'2.5" N, Longitude: 149°52'44.5" W

Photograph 10

Description: Debris within the Bluff **Date: 9/8/14**

Photograph 11

Description: Metal and Rope Coming out of the Bluff **Date: 9/8/14**

Municipality of Anchorage SWS

DATE: 09/09/2014 LOC: ARL DAILY OPERATIONS I SCALE WO#: 0001647079

BILL TO: SWS CASH WEIGHED CUSTOMERS CUST ID: 1099999999
VEHICLE ID: CA CONTAINER ID/SOURCE: -

TIME IN: 14:32 GROSS WEIGHT: 7,880 PO#:
TIME OUT: 14:46 TARE WEIGHT: 7,420
NET WEIGHT: 460

MATERIAL	DESCRIPTION	QUANTITY	RATE	AMOUNT
TRASH	DISPOSAL CHARGE PER TON ARL	0.23	$56.50	$15.00
None	Community recycle surcharge - Res - ARL	1.00	$1.00	$1.00

NOTES:
SILVER GMC 2500HD/CHALL/CONCRETE/GWA652

TOTAL	16.00
CHECK# 1722	(16.00)
BALANCE	0.00

DRIVER'S SIGNATURE

OU5 Wetland Remediation

Date 24 January 2014

Pumpstation #1 **Time:** 15:00

Water Depth
Iron Precipitation heavy
Vegetation winter conditions
Sheen None observed
Odor N/A
Observations Winter conditions, with warming trend over the last week. everything is looking good.
Took 3 pictures

Pumpstation # 2 **Time:** 15:15

Vegetation winter conditions
Observations All ok, winter conditions

Wetland V-notch weir **Time:** 15:20

Wetland water surface elevation 94.0
V-notch flow rate 88.235 gpm.
Vegetation ok - winter conditions
Beaver Activity None
Observations winter conditions -
took 3 pictures.

Wetland East End **Time:** 15:30

Black pipe flow rate 5.01 gpm.
White pipe flow rate 10.06 gpm
Vegetation ok - winter conditions
Observations
Winter conditions - ice covering aprox 90% of pond.
took 3 pics

OU5 Wetland Remediation

Date 28 February 2014

Pumpstation #1 **Time:**

Water Depth
Iron Precipitation heavy
Vegetation winter conditions
Sheen None observed
Odor N/A
Observations winter conditions

Pumpstation # 2 **Time:**

Vegetation
Observations WNL o/c

Wetland V-notch weir **Time:**

Wetland water surface elevation 94.0
V-notch flow rate 88.235
Vegetation o/c winter conditions
Beaver Activity None
Observations Winter conditions

Wetland East End **Time:**

Black pipe flow rate 4.98 gpm
White pipe flow rate 9-89 gpm
Vegetation o/c
Observations winter conditions ice covering approx 95% of pond

OU5 Wetland Remediation

Date 3/31/14

Pumpstation #1 **Time:** 14:30

Water Depth _____
Iron Precipitation Heavy
Vegetation Starting to sprout for spring
Sheen None
Odor None
Observations - Still covered in snow and ice. Starting to melt.
took 2 pictures

Pumpstation # 2 **Time:** 14:35

Vegetation Starting to sprout
Observations Still covered in snow, but starting to melt

Wetland V-notch weir **Time:** 14:40

Wetland water surface elevation 36
V-notch flow rate 90.9 gal/min
Vegetation Starting to sprout new growth.
Beaver Activity None
Observations took 3 pics - Pond still covered in snow & ice

Wetland East End **Time:** 14:45

Black pipe flow rate 8.85 gpm
White pipe flow rate 10.77 gpm
Vegetation Starting to sprout new growth
Observations took 3 pics. Pond still covered in snow & ice starting to melt

OU5 Wetland Remediation

Date____04/15/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1020_____**

Water Depth_____
Iron Precipitation___Slight_____
Vegetation____No stress Winter conditions___
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy - winter conditions_____
Collection area iced over, covered with a few inches of snow.

_____
_____

Pumpstation # 2 **Time:___1030_____**

Vegetation___Healthy looking no issues - Winter Conditions_____
Observations___All okay, No issues observed___Starting to melt_____
_____
_____
_____

Wetland V-notch weir **Time:__1035____**

Wetland water surface elevation___37.8_____
V-notch flow rate____60.0 GPM_____
Vegetation___Healthy no issues_ - Winter Conditions_____
Beaver Activity____None_____
Observations_____
Healthy vegetation, Winter conditions, No issues noted, Starting to melt_____
_____
_____

Wetland East End **Time:___1045_____**

Black pipe flow rate____5.01GPM_____
White pipe flow rate____10.06 GPM_____
Vegetation___No stress - Winter Conditions_____
Observations___Took 3 photos, no issues noted_Starting to melt, no open water on the_____
Collection area.

_____
_____

OU5 Wetland Remediation

Date____05/23/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1020_____**

Water Depth_____
Iron Precipitation___Slight_____
Vegetation____No stress Winter conditions___
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy - winter conditions_____
Collection area iced over, covered with a few inches of snow.
_____
_____

Pumpstation # 2 **Time:___1030_____**

Vegetation___Healthy looking no issues - Winter Conditions_____
Observations___All okay, No issues observed___Starting to melt_____
_____
_____
_____

Wetland V-notch weir **Time:__1035____**

Wetland water surface elevation___94.0_____
V-notch flow rate____90.9 GPM_____
Vegetation___Healthy no issues_ - Winter Conditions_____
Beaver Activity____None_____
Observations_____
Healthy vegetation, Winter conditions, No issues noted, Starting to melt_____
_____
_____

Wetland East End **Time:___1045_____**

Black pipe flow rate____8.56 GPM_____
White pipe flow rate____10.20 GPM_____
Vegetation___No stress - Winter Conditions_____
Observations___Took 3 photos, no issues noted_Collection pond is about 90% open_____

_____
_____

OU5 Wetland Remediation

Date____06/06/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1200_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation___No stress - healthy___
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy _____

_____
_____

Pumpstation # 2 **Time:___1205_____**

Vegetation___Healthy looking no issues
Observations___All okay, No issues observed

_____
_____
_____

Wetland V-notch weir **Time:__1210____**

Wetland water surface elevation___94.0_____
V-notch flow rate____90.0 GPM_____
Vegetation___Healthy no issues _____
Beaver Activity____None_____
Observations_____
Healthy vegetation,

_____
_____

Wetland East End **Time:___1220_____**

Black pipe flow rate____9.02 GPM_____
White pipe flow rate____10.17 GPM_____
Vegetation___No stress _____
Observations___Took 3 photos, no issues noted _____

_____
_____

OU5 Wetland Remediation

Date____06/14/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1200_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation___No stress - healthy___
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy _____
Took 3 Photos

_____
_____

Pumpstation # 2 **Time:___1205_____**

Vegetation___Healthy looking no issues
Observations___All okay, No issues observed
Took 1 picture

_____
_____

Wetland V-notch weir **Time:__1210____**

Wetland water surface elevation___94.0_____
V-notch flow rate____90.0 GPM_____
Vegetation___Healthy no issues _____
Beaver Activity____None_____
Observations_____
Healthy vegetation, Took 3 pictures

_____
_____

Wetland East End **Time:___1220_____**

Black pipe flow rate____9.08 GPM_____
White pipe flow rate____10.45 GPM_____
Vegetation___No stress _____
Observations___Took 3 photos, no issues noted _____

_____
_____

OU5 Wetland Remediation

Date____06/20/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1500_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation___No stress - healthy___
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy _____

_____
_____

Pumpstation # 2 **Time:___1505_____**

Vegetation___Healthy looking no issues
Observations___All okay, No issues observed
Took 1 picture

_____
_____

Wetland V-notch weir **Time:__1510____**

Wetland water surface elevation___94.0_____
V-notch flow rate____64.78 GPM_____
Vegetation___Healthy no issues _____
Beaver Activity____None_____
Observations_____
Healthy vegetation, Took 3 pictures

_____
_____

Wetland East End **Time:___1520_____**

Black pipe flow rate____5.00 GPM_____
White pipe flow rate____10.50 GPM_____
Vegetation___No stress _____
Observations___Took 3 photos, no issues noted _____

_____
_____

OU5 Wetland Remediation

Date____06/27/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1500_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation___No stress - healthy___
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy _____

_____
_____

Pumpstation # 2 **Time:___1505_____**

Vegetation___Healthy looking no issues
Observations___All okay, No issues observed
Took 1 picture

_____
_____

Wetland V-notch weir **Time:__1510____**

Wetland water surface elevation___94.0_____
V-notch flow rate____66.79 GPM_____
Vegetation___Healthy no issues _____
Beaver Activity____None_____
Observations_____
Healthy vegetation, Took 3 pictures

_____
_____

Wetland East End **Time:___1520_____**

Black pipe flow rate____6.20 GPM_____
White pipe flow rate____10.05 GPM_____
Vegetation___No stress _____
Observations___Took 3 photos, no issues noted _____

_____
_____

OU5 Wetland Remediation

Date____07/10/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1500_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1505_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1515_____**

Wetland water surface elevation___94.1_____
V-notch flow rate____62 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____No_____
Observations_____

_____
_____

Wetland East End **Time:___1530_____**

Black pipe flow rate____9.89 GPM_____
White pipe flow rate____11.48_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____07/10/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1500_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1505_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1515_____**

Wetland water surface elevation___94.1_____
V-notch flow rate____62 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____No_____
Observations_____

_____
_____

Wetland East End **Time:___1530_____**

Black pipe flow rate____9.89 GPM_____
White pipe flow rate____11.48_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____07/17/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1500_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1505_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1515_____**

Wetland water surface elevation___94.0_____
V-notch flow rate____60.82 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____No_____
Observations_____

_____
_____

Wetland East End **Time:___1530_____**

Black pipe flow rate____9.92 GPM_____
White pipe flow rate____12.71 GPM_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____07/24/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1600_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1605_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1615_____**

Wetland water surface elevation___94.0_____
V-notch flow rate____61.01 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____No_____
Observations_____

_____
_____

Wetland East End **Time:___1630_____**

Black pipe flow rate____10.01 GPM_____
White pipe flow rate____11.95 GPM_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____07/31/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1600_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1605_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1615_____**

Wetland water surface elevation___94.0_____
V-notch flow rate____61.01 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____No_____
Observations_____

_____
_____

Wetland East End **Time:___1630_____**

Black pipe flow rate____9.89 GPM_____
White pipe flow rate____10.04 GPM_____
Vegetation___No stress_____
Observations: ___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____9/1/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1800_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____

Pumpstation # 2 **Time:___1805_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____

Wetland V-notch weir **Time:__1810_____**

Wetland water surface elevation___93.9_____
V-notch flow rate____60 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____Yes_____
Observations_____
Healthy vegetation, Cleared Beaver activity, removed debris from V notch weir
Regained normal flowover the weir after removal of debris

Wetland East End **Time:___1930_____**

Black pipe flow rate____10 GPM_____
White pipe flow rate____12.71_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____

OU5 Wetland Remediation

Date____9/5/14_____ **Observers Name: Kris Hadden**

Pumpstation #1 **Time:___1500_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1515_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1530_____**

Wetland water surface elevation___93.9_____
V-notch flow rate____60 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____Yes_____
Observations_____
Removed beaver activiy
_____
_____

Wetland East End **Time:___1540_____**

Black pipe flow rate____10 GPM_____
White pipe flow rate____12.71_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____9/12/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1520_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1525_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1535____**

Wetland water surface elevation___93.9_____
V-notch flow rate____53.6 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____None_____
Observations_____
_____Healthy vegetation, No issues noted_____
_____
_____

Wetland East End **Time:___1555_____**

Black pipe flow rate____9.77GPM_____
White pipe flow rate____12.77_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____9/19/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1520_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1525_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1535____**

Wetland water surface elevation___94.1_____
V-notch flow rate____57.7 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____None_____
Observations_____
_____Healthy vegetation, No issues noted_____
_____
_____

Wetland East End **Time:___1555_____**

Black pipe flow rate____9.07GPM_____
White pipe flow rate____12.94_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____9/26/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1615_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress_____
Sheen____slight_____
Odor_____none_____
Observations___Vegetation looks healthy no issues_____
_____
_____
_____

Pumpstation # 2 **Time:___1620_____**

Vegetation___Healthy looking no issues_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1625____**

Wetland water surface elevation___94.0_____
V-notch flow rate____58.0 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____None_____
Observations_____
_____Healthy vegetation, No issues noted_____
_____
_____

Wetland East End **Time:___1555_____**

Black pipe flow rate____8.98GPM_____
White pipe flow rate____13.15_____
Vegetation___No stress_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

OU5 Wetland Remediation

Date____10/30/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1605_____**

Water Depth_____
Iron Precipitation___Heavy_____
Vegetation____No stress
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy -_____

Pumpstation # 2 **Time:___1610_____**

Vegetation___Healthy looking no issues - Win
Observations___All okay, No issues observed_____

Wetland V-notch weir **Time:__1615____**

Wetland water surface elevation___94.1_____
V-notch flow rate____58.0 GPM_____
Vegetation___Healthy no issues_____
Beaver Activity____None_____
Observations_____
_____Healthy vegetation, No issues noted_____

Wetland East End **Time:___1625_____**

Black pipe flow rate____8.88 GPM_____
White pipe flow rate____12.92_____
Vegetation___No stress -_____
Observations___Took 3 photos, no issues noted_____

OU5 Wetland Remediation

Date 11/26/2014

Pumpstation #1 **Time:** 16:00

Water Depth_____
Iron Precipitation Heavy
Vegetation winter - dormant
Sheen Light
Odor None
Observations Winter conditions Ice forming on pond
Took 2 pictures

Pumpstation # 2 **Time:** 16:05

Vegetation Winter - dormant
Observations Winter conditions - dormant vegetation
Took one picture

Wetland V-notch weir **Time:** 16:15

Wetland water surface elevation 36
V-notch flow rate 80.4 GPM
Vegetation winter conditions - dormant
Beaver Activity none
Observations Pond iced over.
Took 3 pictures

Wetland East End **Time:** 16:25

Black pipe flow rate 7.75 GPM
White pipe flow rate 5.0 GPM
Vegetation Winter conditions - Dormant
Observations Took 3 pictures. -Pond is covered in ice.

OU5 Wetland Remediation

Date____12/19/14_____ **Observers** _____Kris Hadden____

Pumpstation #1 **Time:___1020_____**

Water Depth_____
Iron Precipitation___Slight_____
Vegetation____No stress Winter conditions__
Sheen____none_____
Odor_____none_____
Observations___Vegetation looks healthy - winter conditions_____
Collection area iced over, covered with a few inches of snow.
_____
_____

Pumpstation # 2 **Time:___1030_____**

Vegetation___Healthy looking no issues - Winter Conditions_____
Observations___All okay, No issues observed_____
_____
_____
_____

Wetland V-notch weir **Time:__1035____**

Wetland water surface elevation___38.9_____
V-notch flow rate____60.0 GPM_____
Vegetation___Healthy no issues_ - Winter Conditions_____
Beaver Activity____None_____
Observations_____
Healthy vegetation, Winter conditions, No issues noted_____
_____
_____

Wetland East End **Time:___1045_____**

Black pipe flow rate____7.89 GPM_____
White pipe flow rate____10.35_____
Vegetation___No stress - Winter Conditions_____
Observations___Took 3 photos, no issues noted_____
_____
_____
_____

Photograph 1

Description: Detention Pond V-Notch Facing North **Date: 1/24/14**

Photograph 2

Description: Detention Pond Water Elevation **Date: 1/24/14**

Photograph 3

Description: Black Pipe at Seeps 10 and 11 **Date: 1/24/14**

Photograph 4

Description: V-Notch Facing South **Date: 1/24/14**

Photograph 5

Description: Detention Pond Water Elevation **Date: 2/28/14**

Photograph 6

Description: Black Pipe at Seeps 10 and 11 **Date: 2/28/14**

Photograph 7

Description: Seep 1 Collection Area **Date: 6/6/14**

Photograph 8

Description: Detention Pond Water Elevation **Date: 6/6/14**

Photograph 9

Description: Detention Pond Water Elevation **Date: 10/30/14**

Photograph 10

Description: Black Pipe at Seeps 10 and 11 **Date: 10/30/14**

Photograph 11

Description: East End of Detention Pond Facing West **Date: 10/30/14**

Photograph 12

Description: V-Notch **Date: 11/26/14**

Photograph 13

Description: V-Notch **Date: 11/26/14**

Photograph 14

Description: V-Notch Facing South **Date: 11/26/14**

A-2 JBER-Richardson Field Records

- Sample Collection Forms
- Field Notes

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WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-5246

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/4/14

Project #: 457958.09 JB.05 Start Time: 1344

Field Team: Jennifer Ulrich & Mike Landon End Time: 1445

Sample ID: 14Q3CG039-AP5246-GW-0 Time: 1430 primary dup other: ——

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes (0.45um) 0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	147.24
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	163.5
Casing diameter:	2 in. (0.163) / 4 in. 0.653	Water Column (Ft)	16.26
gal/Ft of casing:	152	Casing Volume (gal)	2.605
Pump Intake Depth	~~153~~ 158	Screen Interval	148-158
Stable DTW (FTOC):	147.24	Measured Stickup	3.15

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:	Bailer: TEFLON SS OTHER:
Pump Type: QED Flow Rate (gpm): 0.35	Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Pump Time: 1 hr Vol. Purged (gals): 1.5	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*
Temperature	>0.00 °C	± 1.0 °C	Time DTW
pH	0-14	± 0.2	1350 147.24 - 147.25
Conductivity	0-9.99 S/m	± 3%	1355 147.24
Dissolved Oxygen	0-19.99 mg/L	± 10%	~~1405~~ STABLE @ 147.24
Turbidity	0-800 NTU	± 10% (≥10 NTU)	

Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)	
1	1405	147.24	~~0.3~~	6.96	0.372	3.74	4.12	6.89	223.3	
2	1410	147.24	0.6	7.35	0.340	2.39	4.53	6.57	214.8	
3	1415	147.24	0.9	7.48	0.335	1.95	4.56	5.77	207.6	
4	1420	147.24	~~0.6~~ 1.2	7.54	0.331	1.57	4.69	5.41	207.0	
5	1425	147.24	~~1.5~~	7.57	0.328	0.95	4.86	5.34	206.8	Sample Collection
6	1430									
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater

Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or ~1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: (Clear) ~~Amber~~ ~~Tan~~ Brown, Grey, Milky White, Other:

Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: (None) ~~Low~~ Medium, High, Very Turbid, Heavy Silts

Comments:

1350 - Turbidity @ 15.0 NTU / RAINING

- Begin purge @ 1344

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-5683

Project: Fort Richardson Compliance Sites GW Monitoring CG039

Date: 9/4/14

Project #: 457958.09.JB.05

Start Time: 1545

Field Team: Jennifer Ulrich & Mike Landon

End Time: 1640

Sample ID: 14Q3CG039-AP5683-GW-0 Time: 1625 primary dup other: —

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	134.54
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	152.50
Casing diameter:	2 in. 4 in.	Water Column (Ft)	17.96
gal/Ft of casing:	0.163 0.653	Casing Volume (gal)	2.93
Pump Intake Depth	141	Screen Interval	139.3-144.3
Stable DTW (FTOC):	134.50	Measured Stickup	3.5' Ft

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER:	Bailer: TEFLON SS OTHER:
Pump Type: QED Flow Rate (gpm): 0.35	Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Pump Time: Vol. Purged (gals): 2.2	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*	
			Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1545	134.50
pH	0-14	± 0.2	1550	134.51
Conductivity	0-9.99 S/m	± 3%	1555	134.51
Dissolved Oxygen	0-19.99 mg/L	± 10%	1600	
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1600	134.50	~1.0	7.64	0.206	2.40	2.71	5.27	207.4	
2	1605	134.50	~1.3	7.80	0.206	1.56	2.76	5.11	203.6	
3	1610	134.50	~1.6	7.89	0.206	1.57	3.15	5.12	201.0	
4	1615	134.50	~1.9	7.94	0.205	1.25	3.35	5.25	200.7	
5	1620	134.50	~2.2	7.96	0.205	1.73	3.46	5.33	201.2	SAMPLE COLLECTION
6	1625									
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color:	Clear, Amber, Tan, Brown, Grey, Milky White, Other
Odor:	None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity:	None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: TURBIDITY @ 1550 5.42 NTU

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3747

Project: Fort Richardson Compliance Sites GW Monitoring C6039 Date: 9/5/14

Project #: 457958.09.JB.05 Start Time: 1347

Field Team: Jennifer Ulrich & Mike Landon End Time: 1437

Sample ID: 14Q3C6039-AP3747-GW-0 Time: 1415 (PRI) dup other:

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes (0.45um) 1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	21.29
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	33.60
Casing diameter:	~~2 in.~~ (4 in.)	Water Column (Ft)	12.41
gal/Ft of casing:	~~0.163~~ 0.653	Casing Volume (gal)	JUF ~~2.02~~ 8.10
Pump Intake Depth	38	Screen Interval	
Stable DTW (FTOC):	21.44	Measured Stickup	~3 ft

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER: Bailer TEFLON SS OTHER:

Pump Type: QED Flow Rate (gpm): ~0.1 Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Pump Time: 50 min Vol. Purged (gals): 2 Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1355	21.32
pH	0-14	± 0.2	1400	21.42
Conductivity	0-9.99 S/m	± 3%	1405	21.44
Dissolved Oxygen	0-19.99 mg/L	± 10%	1410	21.44
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*
1	1355	21.32	0.5 ~	7.64	0.219	6.66	1.56	4.46	240.1
2	1400	21.42	~1.0	7.61	0.216	6.47	1.81	4.43	242.9
3	1405	21.44	~1.5	7.60	0.213	5.63	1	4.65	247.3
4	1410	21.44	~2.0	7.60	0.212	5.19		4.71	250.3
5	1415								
6									
7									
8									
9									

Sample

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or ~1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: (Clear) ~~Amber~~ Tan, Brown, Grey, Milky White, Other:

Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: (None) ~~Low~~ Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3748

Project: Fort Richardson Compliance Sites GW Monitoring CGD39

Date: 9/5/14

Project #: 457958.09. JB.05

Start Time: 1210

Field Team: Jennifer Ulrich & Mike Landon

End Time: 1315

Sample ID: 140SCGD39-AP3748-GW-0 Time: 1240 primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	130.66
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	174.30
Casing diameter:	2 in. / 4 in.	Water Column (Ft):	43.64
gal/Ft of casing:	0.163 / 0.653	Casing Volume (gal)	7.11
Pump Intake Depth	154	Screen Interval	
Stable DTW (FTOC):	130.68	Measured Stickup	3.3ft

Method of Purging (circle one)

Pump: SUB / BLDR PERIST OTHER:

Pump Type: QED Flow Rate (gpm): 0.06

Pump Time: 1hr 5min Vol. Purged (gals):

Bailer: TEFLON SS OTHER:

Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1230	130.68
pH	0-14	± 0.2	1235	130.68
Conductivity	0-9.99 S/m	± 3%	1240	130.68
Dissolved Oxygen	0-19.99 mg/L	± 10%		
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*
1	1225	130.66	0.3	7.43	0.372	15.5	0.83	8.69	241.7
2	1235	130.68	0.6	7.49	0.370	12.1	1.10	8.27	246.0
3	1240	130.68	~0.9	7.54	0.368	13.6	1.40	7.49	248.0
4	1245	130.68	~1.2	7.59	0.389	13.1	1.40	7.36	235.0
5	1250	130.68	~1.5	7.66	0.376	13.6	1.40	7.19	252.7
6	1255								
7									
8									
9									

1230

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or ~1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: Clear / Cloudy / Tan, Brown, Grey, Milky White, Other:

Odor: None / Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None / Low, Medium, High, Very Turbid, Heavy Silts

Comments:

* DO PROBE MALFUNCTIONING. WORK TO TROUBLESHOOT

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP4344

Project: Fort Richardson Compliance Sites GW Monitoring C6039 Date: 9/5/14

Project #: 457958.09 JB.05 Start Time: 0946

Field Team: Jennifer Ulrich & Mike Landon End Time: 1115

Sample ID: 14Q3C6039-AP4344-GW-B Time: 1105 primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	146.86
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	166.-
Casing diameter:	2 in. / 4 in.	Water Column (Ft)	19.14
gal/Ft of casing:	0.163 / 0.653	Casing Volume (gal)	3.12
Pump Intake Depth	156	Screen Interval	
Stable DTW (FTOC):	146.86	Measured Stickup	3.2ft

Method of Purging (circle one)

Pump: SUB / BLDR / PERIST / OTHER:	Bailer: TEFLON / SS / OTHER:
Pump Type: QED Flow Rate (gpm): 0.06	Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Pump Time: Vol. Purged (gals):	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1010	146.86
pH	0-14	± 0.2	1015	146.86
Conductivity	0-9.99 S/m	± 3%	1020	146.86
Dissolved Oxygen	0-19.99 mg/L	± 10%		
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)* *	*Temp (C)*	*ORP (mV)*
1	1010	146.86	20.60	7.45	0.228	85.3	21.17	6.23	226.0
2	1015	146.86	20.75	7.69	0.226	55.6	23.04	5.71	224.3
3	1020	146.86	20.90	7.78	0.225	48.7	22.96	5.50	224.7
4	1025	146.86	21.2	7.84	0.225	47.4	24.68	5.48	225.8
5	1030	146.86	21.5	7.87	0.225	42.2	25.66	5.41	228.0
6	1035	146.86	21.8	7.88	0.226	35.7	26.53	5.34	229.6
7	1040	146.86	22.1	7.90	0.225	29.0	27.29	5.36	231.7
8	1045	146.86	22.4	7.91	0.225	22.3	27.56	5.35	232.8
9	1050	146.86	22.7	7.92	0.225	17.7	28.71	5.35	234.6
	1055	146.86	23.0	7.92	0.225	17.0	29.02	5.34	236.3

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or .1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: Clear / Straw / Tan, Brown, Grey, Milky White, Other:

Odor: None / Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ? Unknown

Turbidity: None / Low, Medium, High, Very Turbid, Heavy Silts

Comments: TUBING SLIPPED FROM CLAMP AND STURED UP WELL PRIOR TO PURGE - TURBIDITY * DO readings high try troubleshooting → no change

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-4353

Project: Fort Richardson Compliance Sites GW Monitoring C6839 Date: 9/5/14

Project #: 457958.09.JB.05 Start Time: 1514

Field Team: Jennifer Ulrich & Mike Landon End Time: 1550

Sample ID: 14Q3C6839-AP4353-GW-0 Time: 1545 (PE) dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes (0.45µm) 1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	32.01
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	70.10
Casing diameter:	(2 in) 4 in.	Water Column (Ft):	38.09
gal/Ft of casing:	(0.163) 0.653	Casing Volume (gal)	6.21
Pump Intake Depth	62	Screen Interval	57-67
Stable DTW (FTOC):		Measured Stickup	~3.5 ft

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:	Bailer: TEFLON SS OTHER:
Pump Type: QED Flow Rate (gpm): 0.1	Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Pump Time: Vol. Purged (gals):	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*
Temperature	>0.00 °C	± 1.0 °C	Time DTW
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10% (≥10 NTU)	

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1520	32.77	~0.2	6.82	0.255	2.39	0.47	5.59	-53.2	
2	1525	32.93	~0.7	6.78	0.255	1.30	0.64	6.31	-54.2	
3	1530	33.03	~1.2	6.77	0.257	1.17	1.	6.11	-40.9	
4	1535	33.09	~1.7	6.76	0.258	0.82		6.04	-34.0	
5	1540	33.11	~2.2	6.76	0.258	0.61	1.5	5.95	-37.2	sample
6	1545									
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: (Clear) Amber Tan, Brown, Grey, Milky White, Other:

Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None (Low) Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3989

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/9/14

Project #: 457958.09. JB.05 Start Time: 1132

Field Team: Jennifer Ulrich & Mike Landon End Time: 1223

Sample ID: 14DJCG039-AP3989-GW-0 Time: 1210 dup other:

Sample ID: Time: primary dup other:

Sample ID: Time: primary dup other

Filtered? Yes (0.45um)/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	25.55
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	36.80
Casing diameter: (2 in.) 4 in.		Water Column (Ft)	11.25
gal/Ft of casing: (0.163) 0.653		Casing Volume (gal)	1.83
Pump Intake Depth	30.-	Screen Interval	24-34
Stable DTW (FTOC):	25.66	Measured Stickup	2.5ft

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER	Bailer TEFLON SS OTHER:
Pump Type: QED Flow Rate (gpm): 0.06	Required Pulls: Bailer Vol. (gals) 0.25/ 0.33
Pump Time: ~1hr Vol. Purged (gals): 1.8	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*	
			Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1140	25.65
pH	0-14	± 0.2	1145	25.66
Conductivity	0-9.99 S/m	± 3%	1150	25.66
Dissolved Oxygen	0-19.99 mg/L	± 10%	1155	25.66
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*
1	1140	25.65	0.3 ~	7.38	0.676	13.6	2.08	6.49	-99.1
2	1145	25.66	~0.6	7.41	0.691	11.8	1.52	6.29	-113.6
3	1150	25.66	~0.9	7.43	0.695	7.71	1.35	6.10	-107.8
4	1155	25.66	~1.2	7.43	0.706	4.77	1.15	6.10	-128.3
5	1200	25.66	~1.5	7.42	0.709	2.73	1.06	5.99	-116.0
6	1205	25.66	~1.8	7.43	0.712	2.02	1.03	5.89	-119.0
7	1210								
8									
9									

Sample ~~Time~~ Collection

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or ~1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color:	(Clear) ~~Amber~~, Tan, Brown, Grey, Milky White, Other:
Odor:	(None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity:	None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments: Collect Ferrous Iron field test here = 3.30 mg/L

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3744

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/9/14

Project #: 457958.09.JB.05 Start Time: 1008

Field Team: Jennifer Ulrich & Mike Landon End Time: 1108

Sample ID: 14Q3CG039-AP3744-GW-0 Time: 1035 primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	24.90
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	38.71
Casing diameter:	~~2 in.~~ 4 in.	Water Column (Ft):	13.81
gal/Ft of casing:	~~0.163~~ 0.653	Casing Volume (gal)	9.02
Pump Intake Depth	30	Screen Interval	26.5-36.5
Stable DTW (FTOC):	24.91	Measured Stickup	2.8ft

Method of Purging (circle one)

Pump: SUB ~~BLDR~~ PERIST OTHER: Bailer: TEFLON SS OTHER:

Pump Type: QED Flow Rate (gpm): 0.1 Required Pulls: Bailer Vol. (gals) 0.25/ 0.33

Pump Time: ~~1008~~ 1w Vol. Purged (gals): 2.0 Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*	
			Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1015	24.91
pH	0-14	± 0.2	1020	24.91
Conductivity	0-9.99 S/m	± 3%	1025	24.91
Dissolved Oxygen	0-19 99 mg/L	± 10%	1030	24.91
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1015	24.91	~0.5	7.15	0.574	10.6	8.64	4.96	8.7	
2	1020	24.91	~1.0	7.08	0.314	9.20	7.54	4.78	6.0	
3	1025	24.91	~1.5	7.06	0.315	8.07	7.19	4.65	5.7	
4	1030	24.91	~2.0	7.08	0.318	6.45	6.92	4.63	6.4	SAMPLE COLLECT
5	1035									
6										
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater.
Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: (Clear) ~~Amber~~ Tan, Brown, Grey, Milky White, Other:

Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments: Collected Ferrous Iron field test = 0.00 mg/L

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-4550

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/9/14

Project #: 457958.09. JB.05 Start Time 1417

Field Team: Jennifer Ulrich & Mike Landon End Time: 1545

Sample ID: 14Q3CG039-AP4550-GW-0 Time: 1455 primary dup other:

Sample ID: 14Q3CG039-AP4550-GW-1 Time: 1500 primary dup other:

Sample ID: 14Q3CG039-AP4550-GWMS Time: 1455 primary dup other: MS

Sample ID: 14Q3CG039-AP4550-GW-MSD Filtered? Yes 0.45um 1.0um Time: 1455 other: MSD

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	22.63
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	43.50
Casing diameter:	2 in / 4 in	Water Column (Ft)	20.87
gal/Ft of casing:	0.163 / 0.653	Casing Volume (gal)	3.40
Pump Intake Depth	38.-	Screen Interval	32-42
Stable DTW (FTOC):	22.65	Measured Stickup	3ft

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER:

Pump Type: QED Flow Rate (gpm): 0.1

Pump Time: ~1.5hrs Vol Purged (gals): 3

Bailer: TEFLON SS OTHER:

Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time	DTW
Temperature	>0.00 °C	± 1.0 °C		
pH	0-14	± 0.2	1425	22.65
Conductivity	0-9.99 S/m	± 3%	1430	22.65
Dissolved Oxygen	0-19 99 mg/L	± 10%	1435	22.65
Turbidity	0-800 NTU	± 10% (≥10 NTU)	1440	22.65

Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)	
1	1425	22.65	0.5	6.78	0.354	137	1.43	6.24	-80.3	
2	1430	22.65	~1.0	6.78	0.357	114	1.15	6.15	-81.9	
3	1435	22.65	~1.5	6.78	0.365	67.6	1.07	6.03	-83.4	
4	1440	22.65	~2.0	6.78	0.366	53.9	1.01	6.05	-86.7	
5	1445	22.65	~2.5	6.77	0.370	51.3	0.93	6.00	-89.5	
6	1450	22.65	~3.0	6.76	0.370	49.2	0.90	6.00	-96.2	PRIMARY, MS/MSD SAMPLE
7	1455									FD SAMPLE
8	~~1500~~ 1500									
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:

Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: Ferrous iron field test collected here = 3.01 mg/L

* White substance (likely EVOs) observed on tubing.

* TURBIDIMETER MALFUNCTIONING

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3983R

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/9/14

Project #: 457958.09.JB.05 Start Time: 1255

Field Team: Jennifer Ulrich & Mike Landon End Time: 1345

Sample ID: 14G03CG039-AP3983R-GW-0 Time: 1330 (PWM) dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes (0.45um/1.0um)

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	23.70
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	45.50
Casing diameter:	(2 in.) 4 in.	Water Column (Ft)	21.80
gal/Ft of casing:	(0.163) 0.653	Casing Volume (gal)	3.55
Pump Intake Depth	35.-	Screen Interval	30-40.
Stable DTW (FTOC):	24.01	Measured Stickup	~4 ft

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:	Bailer TEFLON SS OTHER:
Pump Type: QED Flow Rate (gpm): 0.08	Required Pulls: Bailer Vol. (gals) 0.25/ 0.33
Pump Time: ~1 hr. Vol. Purged (gals): 1.6	Vol Purged (gals)

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*	
			Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1310	23.91
pH	0-14	± 0.2	1315	24.01
Conductivity	0-9.99 S/m	± 3%	1320	24.01
Dissolved Oxygen	0-19.99 mg/L	± 10%	1325	24.01
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1310	23.91	~0.4	7.02	1.353	34.7	1.70	7.57	-102.6	
2	1315	24.01	~0.8	7.04	1.360	23.1	1.24	7.33	-105.0	
3	1320	24.01	~1.2	7.05	1.362	22.1	1.24	7.17	-96.9	
4	1325	24.01	~1.6	7.05	1.362	21.0	1.20	7.34	-94.2	Sample Collect
5	1330									
6										
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color:	Clear, ~~Amber~~, Tan, Brown, (Grey), Milky White, Other: BLACK PARTICLES
Odor:	~~None~~, Low, (Medium), High, Very Strong, H2S, Fuel Like, Chemical, (Unknown) FISH-LIKE
Turbidity:	None, (Low), ~~Medium~~, High, Very Turbid, Heavy Silts

Comments: Ferrous Iron field test collected here = 3.30 mg/L

* Black staining/coating on outside of tubing (same length as water column).

~~Slight~~ Jul (Black particulate in water, not impacting NTUs much

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-4551

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/10/11

Project #: 457958.09. JB.05 Start Time: 1123

Field Team: Jennifer Ulrich & Mike Landon & Annika Seay End Time: 1300

Sample ID: 14Q3CG039-AP4551-GW-0 Time: 1220 (QA) dup other: —

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	95.57
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC)	99.40
Casing diameter:	(2 in.) 4 in.	Water Column (Ft)	3.83
gal/Ft of casing:	(0.163) 0.653	Casing Volume (gal)	0.624
Pump Intake Depth	~~99~~ N/A	Screen Interval	
Stable DTW (FTOC):	95.60 ~~N/A~~	Measured Stickup	~3.2ft

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER: Bailer: TEFLON SS OTHER:

Pump Type: QED Flow Rate (gpm): 0.03 Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Pump Time: Vol. Purged (gals): 1.0 Vol Purged (gals)

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria
Temperature	>0.00 °C	± 1.0 °C
pH	0-14	± 0.2
Conductivity	0-9.99 S/m	± 3%
Dissolved Oxygen	0-19.99 mg/L	± 10%
Turbidity	0-800 NTU	± 10% (≥10 NTU)

~~Depth to Water Stabilization~~

Time	~~DTW~~ ~~ATD~~ DTW
1150	95.60
1155	95.60
1200	95.60
1205	95.60

~~TURBIDITY~~

Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)
1	1150	95.60	~0.5	6.86	0.547	62.7	2.79	8.6	24.8
2	1155	95.60	~0.6	6.87	0.534	56.4	1.74	8.5	-33.0
3	1200	95.60	~0.7	6.93	0.521	19.2	1.45	8.4	-36.3
4	1205	95.60	~0.8	6.97	0.513	9.97	1.17	8.4	-38.0
5	1210	95.60	~0.9	7.03	0.510	8.23	1.12	8.3	-39.9
6	1215	95.60	~1.0	7.07	0.508	6.56	1.02	8.3	-41.3
7	1220								
8									
9									

SAMPLE COLLECTION

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: Clear, ~~Amber~~, Tan, Brown, (Grey), Milky White, Other:

Odor: (~~None~~) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown Sulfur

Turbidity: None, ~~Low~~, Medium, High, (Very Turbid), Heavy Silts

Comments: * SVOs IN WATER (AIR?) (VAP) - potentially from EVOs

* TURBIDITY @ 240 NTU - 1140 AM / WAIT FOR TURBIDITY TO DRO BEFORE USING LSI

* Ferrous iron field test collected = 2.97 mg/L

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-4525

Project: Fort Richardson Compliance Sites GW Monitoring CG039 Date: 9/10/14

Project #: 457958.09 JB.05 Start Time 10:40

Field Team: Jennifer Ulrich & Mike Landon End Time: 1105

Sample ID: _____ Time: _____ dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes (0.45um) 0.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	126.58
Depth to Oil/Water Interface (FTOC)	N/A	Total Depth (FTOC):	129.00
Casing diameter:	(2 in.) 4 in.	Water Column (Ft)	2.42 ~~2.72~~
gal/Ft of casing:	(0.163) 0.653	Casing Volume (gal)	~~0.44~~ 0.39
Pump Intake Depth	129	Screen Interval	
Stable DTW (FTOC):		Measured Stickup	

Method of Purging (circle one)

Pump: SUB ~~BLDR~~ PERIST OTHER:	Bailer: TEFLON SS OTHER:
Pump Type: Flow Rate (gpm):	Required Pulls: Bailer Vol. (gals) 0.25/ 0.33
Pump Time: Vol. Purged (gals):	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*
Temperature	>0.00 °C	± 1.0 °C	Time DTW
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10% (≥10 NTU)	

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*
1	10:55	126.32	1L	7.85	~~240.38~~ 0.6826	>1000	—	8.6	240.38
2									
3									
4									
5									
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater
Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color:	Clear, ~~Amber~~, Tan, Brown, Grey, Milky White, Other: milky brown
Odor:	~~None~~, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity:	None, ~~Low~~, Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3468 (MF)

Project: Fort Richardson Compliance Sites GW Monitoring DA089 Date: 9/11/14

Project #: 457958.09. LC.04 Start Time: 1413

Field Team: Jennifer Ulrich & Annika Seay End Time: 1525

Sample ID: 14Q3DA089.09.LC.04 Time: 1500 prim dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	106.62
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	114.75
Casing diameter:	2 in. (4 in.)	Water Column (Ft):	8.13
gal/Ft of casing:	0.163 (0.653)	Casing Volume (gal)	1.33
Pump Intake Depth	110	Screen Interval	103.7-113.7
Stable DTW (FTOC):	106.60	Measured Stickup	~3ft.

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER: Bailer: TEFLON SS OTHER:

Pump Type: QED Flow Rate (gpm) 0.06 Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Pump Time: Vol. Purged (gals): 1.8 Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*
Temperature	>0.00 °C	± 1.0 °C
pH	0-14	± 0.2
Conductivity	0-9.99 S/m	± 3%
Dissolved Oxygen	0-19.99 mg/L	± 10%
Turbidity	0-800 NTU	± 10% (≥10 NTU)

Depth to Water Stabilization	
Time	DTW
1445	106.64
1450	106.60
1455	106.60
~~1500~~ SAS	

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1425	106.63	~~0~~ 0.30	7.49	5.274	123	9.16	9.9	219.4	
2	1430	106.63	~~0.06~~ 0.60	7.51	5.294	40.2	7.03	8.8	221.9	
3	1435	106.63	~~0.12~~ 0.90	7.51	5.336	33.5	6.99	8.3	219.2	
4	1440	106.63	~~0.18~~ 1.20	7.51	5.313	21.8	6.76	8.1	214.3	
5	1445	106.64	~~1.26~~ 1.50	7.51	5.287	17.5	6.98	8.0	209.6	
6	1450	106.60	1.50	7.51	5.244	14.1	6.79	8.2	205.5	
7	1455	106.60	1.80	7.51	5.221	11.6	7.00	8.6	200.4	
8	1500									sample collection
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater
Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: Clear, ~~Amber~~, Tan, Brown, (Grey), Milky White, Other:

Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3534

Project: Fort Richardson Compliance Sites GW Monitoring DA089

Project #: 457958.09. LC. 04

Field Team: Jennifer Ulrich & Annika Seay

Sample ID: 1403DA089-AP3534-GW-0 Time: 1625 (prim) dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes (0.45um)/1.0um

Date: 7/11/14

Start Time: 1355

End Time: 1655

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	106.19
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	140
Casing diameter:	(2 in.) 4 in.	Water Column (Ft):	~~33.81~~ 33.81
gal/Ft of casing:	(0.163) 0.653	Casing Volume (gal)	5.51
Pump Intake Depth	133	Screen Interval	127-137
Stable DTW (FTOC):	106.21	Measured Stickup	~3 ft.

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:

Pump Type: QED Flow Rate (gpm): 0.1

Pump Time: 1hr. Vol. Purged (gals): 1.5

Bailer: TEFLON SS OTHER:

Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Vol Purged (gals):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria
Temperature	>0.00 °C	± 1.0 °C
pH	0-14	± 0.2
Conductivity	0-9.99 S/m	± 3%
Dissolved Oxygen	0-19.99 mg/L	± 10%
Turbidity	0-800 NTU	± 10% (≥10 NTU)

Depth to Water Stabilization

Time	DTW
1605	106.24
1610	106.22
1615	106.21
1620	106.21

Instrument Observations

Round	Time	Water Level (ft BTOC)	Volume Purged (gallons)	pH	Cond (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	ORP (mV)
1	1605	106.24	0	7.77	3.80	19.3	5.70	9.5	196.0
2	1610	106.21	0.5	7.75	3.86	20.8	5.28	8.2	190.6
3	1615	106.21	1.0	8.0	3.80	18.5	5.08	8.1	185.8
4	1620	106.21	1.5	7.75	3.79	19.5	5.08	8.0	181.8
5	1625								→ Sample time
6									
7									
8									
9									

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: (Clear) ~~Amber~~ Tan, Brown, Grey, Milky White, Other:

Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3774

Project: Fort Richardson Compliance Sites GW Monitoring DA089

Date: 9/11/14

Project #: 457958.09.LC.04

Start Time: 1105

Field Team: Jennifer Ulrich & Annika Seay

End Time: 1220

Sample ID: 1403DA089-AP3774-GW-0 Time: 1140 primary dup other: —

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes (0.45um) 1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	103.15
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	116.30
Casing diameter: (2 in.) / 4 in.		Water Column (Ft):	13.15
gal/Ft of casing: (0.163) / 0.653	110	Casing Volume (gal)	2.14
Pump Intake Depth	~~100~~ 105	Screen Interval	105.5 - 115.5
Stable DTW (FTOC):	103.18	Measured Stickup	3.3 ft

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:
Pump Type: QED Flow Rate (gpm): 0.1
Pump Time: 1 hr 15 min Vol. Purged (gals):

Bailer: TEFLON SS OTHER:
Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*
Temperature	>0.00 °C	± 1.0 °C
pH	0-14	± 0.2
Conductivity	0-9.99 S/m	± 3%
Dissolved Oxygen	0-19.99 mg/L	± 10%
Turbidity	0-800 NTU	± 10% (≥10 NTU)

Depth to Water Stabilization

Time	DTW
1120	103.18
1125	103.18
1130	103.18
1135	103.18

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1120	103.18	0.1	7.35	523.6	20.6	7.25	6.6	167.1	
2	1125	103.18	0.5	7.32	520.0	12.5	7.04	6.6	164.7	
3	1130	103.18	1.0	7.31	520.2	8.41	6.77	6.5	165.2	
4	1135	103.18	1.5	7.30	520.9	8.06	6.53	6.5	165.2	
5	1140									sample collection
6										
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber Tan, Brown, Grey, Milky White, Other:
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3870

Project: Fort Richardson Compliance Sites GW Monitoring DA089

Date: 9/8/14

Project #: 457958.09

Start Time: 1350

Field Team: Jennifer Ulrich & Mike Landon

End Time: 1450

Sample ID: 1403DA089-AP3870-GW-0 Time: 1435 (prim) dup other: —

Sample ID: _____ Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	95.94
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	112.10
Casing diameter: (2 in.) 4 in.		Water Column (Ft):	16.16
gal/Ft of casing: (0.163) 0.653		Casing Volume (gal)	2.63
Pump Intake Depth	104	Screen Interval	
Stable DTW (FTOC):	95.96	Measured Stickup	~3 ft

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:
Pump Type: QED Flow Rate (gpm): 0.07
Pump Time: 1 hr. Vol. Purged (gals): 3

Bailer: TEFLON SS OTHER:
Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*	
			Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1405	95.96
pH	0-14	± 0.2	1410	95.96
Conductivity	0-9.99 S/m	± 3%	1415	95.96
Dissolved Oxygen	0-19 99 mg/L	± 10%	1420	95.96
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1405	95.96	~2.5	6.53	0.503	71.0	7.75	8.49	73.0	
2	1410	95.96	~2.0	6.89	0.496	104.0	6.66	7.81	71.3	
3	1415	95.96	~2.5	6.98	0.499	92.7	6.52	7.83	8.7	
4	1420	95.96	~2.0	7.06	0.495	65.5	6.59	7.73	3.9	
5	1425	95.96	~2.5	7.10	0.499	69.6	6.39	7.67	2.2	
6	1430	95.96	~3.0	7.12	0.504	65.7	6.24	7.55	2.6	Sample collect
7	1435	—							—	
8										
9										

Notes: Draw-down should ideally be less than 0 3 feet from the original depth to groundwater.
Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: Clear, ~~Amber~~, Tan, Brown, Grey, (Milky White), Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, ~~Low~~, (Medium), High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3871

Project: Fort Richardson Compliance Sites GW Monitoring DA089

Date: 9-6-14

Project #: 457958.09.

Start Time: 1523

Field Team: Jennifer Ulrich & Mike Landon

End Time: 1620

Sample ID: 14Q3DA089-AP3871-GW-0 Time: 1620 (prim) dup other:

Sample ID: _____ Time: _____ primary dup other:

Sample ID: _____ Time: _____ primary dup other:

Filtered? Yes 0.45um/1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	106.97
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	122.00
Casing diameter:	(2 in.) 4 in.	Water Column (Ft):	15.03
gal/Ft of casing:	(0.163) 0.653	Casing Volume (gal)	2.45
Pump Intake Depth	115	Screen Interval	
Stable DTW (FTOC):	106.97	Measured Stickup	2.4 ft.

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:

Pump Type: QED Flow Rate (gpm): 0.06

Pump Time: 57 mins Vol. Purged (gals):

Bailer: TEFLON SS OTHER:

Required Pulls: Bailer Vol. (gals): 0.25/ 0.33

Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time DTW
Temperature	>0.00 °C	± 1.0 °C	
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10% (≥10 NTU)	

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*
1	1530	106.98	~0.5	7.33	0.560	27.5	7.77	7.72	52.0
2	1535	106.97	~0.8	7.37	0.557	22.7	6.51	7.07	1.9
3	1540	106.97	~1.1	7.37	0.557	20.2	6.26	6.92	-5.5
4	1545	106.97	~1.4	7.37	0.557	16.7	6.20	6.82	-7.2
5	1550	106.97	~1.7	7.37	0.557	16.6	6.10	6.78	-6.3
6	1555	106.97	~2.0	7.36	0.557	16.0	6.06	6.78	-5.7
7	1600								
8									
9									

Sample collected

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater
Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations

Color: (Clear), ~~Amber~~, Tan, Brown, Grey, Milky White, Other:

Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown

Turbidity: None, (Low), Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-3983 (3893)

Project: Fort Richardson Compliance Sites GW Monitoring DAD89
Project #: 457958.09. LC.04
Field Team: Jennifer Ulrich & Annika Seay
Sample ID: 1403DA089-AP3983-GW-0 Time: 1015 primary dup other:
Sample ID: _____ Time: _____ primary dup other:
Sample ID: _____ Time: _____ primary dup other:
Filtered? Yes 0.45um 1.0um

Date: 9/11/14
Start Time: 0940
End Time: 1040

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	84.61
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	124.21
Casing diameter:	2 in. (4 in.)	Water Column (Ft):	39.60
gal/Ft of casing:	0.163 (0.653)	Casing Volume (gal)	6.45
Pump Intake Depth	118	Screen Interval	113.2 - 123.2
Stable DTW (FTOC):	84.79	Measured Stickup	2.75ft

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER:
Pump Type: QED Flow Rate (gpm): 0.06
Pump Time: 1 hr. Vol. Purged (gals): 1.2

Bailer: TEFLON SS OTHER:
Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Vol Purged (gals)

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time	DTW
Temperature	>0.00 °C	± 1.0 °C	0955	84.75
pH	0-14	± 0.2	1000	84.75
Conductivity	0-9.99 S/m	± 3%	1005	84.78
Dissolved Oxygen	0-19.99 mg/L	± 10%	1010	84.79
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	0950	84.74	0	8.67	2.668	17.6	3.92	8.6	30	
2	0955	84.75	0.3	8.49	2.575	7.34	0.54	8.3	-35.9	
3	1000	84.75	0.6	8.48	2.573	3.79	0.40	8.3	-51.4	
4	1005	84.78	0.9	8.45	2.560	1.81	0.30	8.1	-63.1	
5	1010	84.79	1.2	8.43	2.56	2.47	0.30	8.1	-67.6	
6	1015									→ Sample time
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by: 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color: (Clear) Amber, Tan, Brown, Grey, Milky White, Other: SAIS
Odor: (None) Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None) Low, Medium, High, Very Turbid, Heavy Silts

Comments:

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-4342

Project: Fort Richardson Compliance Sites GW Monitoring DA089 Date: 9/15/14

Project #: 457958.09 LC.04 Start Time: 1046

Field Team: Jennifer Ulrich & Mike Landon End Time: 1140

Sample ID: 14Q3DA089-AP4342-GW-0 Time: 1130 primary dup other:

Sample ID: Time: primary dup other:

Sample ID: Time: primary dup other:

Filtered? Yes 0.45um 1.0um

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	97.10
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	102.30
Casing diameter:	2 in 4 in	Water Column (Ft)	5.20
gal/Ft of casing:	0.163 0.653	Casing Volume (gal)	0.85
Pump Intake Depth	100	Screen Interval	90-100
Stable DTW (FTOC):	97.25	Measured Stickup	3ft 7in

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER	Bailer: TEFLON SS OTHER
Pump Type: QED Flow Rate (gpm): 0.06	Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Pump Time: ~1hr. Vol. Purged (gals): 1.0	Vol Purged (gals)

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1110	97.25
pH	0-14	± 0.2	1115	97.25
Conductivity	0-9.99 S/m	± 3%	1120	97.25
Dissolved Oxygen	0-19.99 mg/L	± 10%	1125	97.26
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1110	97.25	0.75	7.89	0.436	33.5	8.46	7.8	148.9	
2	1115	97.25	1.00	7.69	0.432	19.1	8.35	7.9	147.6	
3	1120	97.25	1.3	7.59	0.431	11.1	8.26	7.8	146.3	
4	1125	97.25	1.6	7.60	0.430	6.77	8.28	7.8	142.9	
5	1130									SAMPLE COLLECTION
6										
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or .1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color:	Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor:	None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity:	None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: Turb = 736 NTUs @ initial purge. Wait & check NTUs prior to connecting to YSI

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: ~~AP-4342~~ 4411

Project: Fort Richardson Compliance Sites GW Monitoring DA089

Project #: 457958.09. LC. 94

Field Team: Jennifer Ulrich & Annika Seay

Sample ID: 1403DA089-AP4342-GW-0 Time: 1210 prim

Sample ID: 4411 Time: _____ primary dup other: _____

Sample ID: _____ Time: _____ primary dup other: _____

Filtered? Yes 0.45um / 0um

Date: 9/12/14

Start Time: 1120

End Time: 1250

dup other: —

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC):	68.00
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	72.80
Casing diameter:	2 in. (0.163) / 4 in. 0.653	Water Column (Ft):	4.8
gal/Ft of casing:		Casing Volume (gal)	0.78
Pump Intake Depth	70	Screen Interval	
Stable DTW (FTOC):	N/A	Measured Stickup	N/A

Method of Purging (circle one)

Pump: SUB BLDR PERIST OTHER:
Pump Type: QED Flow Rate (gpm): 0.03
Pump Time: 1h / 20 ... Vol. Purged (gals): 1.0

Bailer: TEFLON SS OTHER:
Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization* Time DTW
Temperature	>0.00 °C	± 1.0 °C	
pH	0-14	± 0.2	
Conductivity	0-9.99 S/m	± 3%	
Dissolved Oxygen	0-19 99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10% (≥10 NTU)	

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1150	68.90	0.30	7.90	3.944	295	9.99	9.7	166.2	
2	1155	6.	0.45	7.91	3.948	263	9.81	9.6	166.5	
3	1200		0.60	7.91	3.947	244	9.74	9.7	166.8	
4	1205		1.0	7.92	3.913	231	8.82	10.4	167.1	→ sample time
5	1210									
6										
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well

Sensory Observations AS

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: Turbidity reading @ 1130 was overrange. Will allow more water to purge and then take another reading.
1135 - ~~turbidity continues to be overrange~~ DTW = 68.49 ft bgs
1140 turbidity is 563 NTU
1145 - turbidity is 346 NTU → plug into YSI for measurements

WELL PURGE AND SAMPLING FIELD SHEET

CH2MHILL

Well ID: AP-4413

Project: Fort Richardson Compliance Sites GW Monitoring DA089

Date: 9/15/14

Project #: 457958.09. LC.04

Start Time: 1212

Field Team: Jennifer Ulrich & Mike Landon

End Time: 1418

Sample ID: 14Q3DA089-AP4413-GW-0 Time: 1300 (prim) dup other:

Sample ID: 14Q3DA089-AP4413-GW-0 Time: 1305 primary (dup) other:

Sample ID: 14Q3DA089-AP4413-GW-0MS Time: 1300 primary dup other: MS

SampleID: 14Q3DA089-AP4413-GW-0SD Filtered? Yes 1300 0.45um 1.0um other: MSD

Time:

Depth to Top of Product (FTOC):	N/A	Depth to Water (FTOC)	71.91
Depth to Oil/Water Interface (FTOC):	N/A	Total Depth (FTOC):	76.55
Casing diameter: (2 in) 4 in.		Water Column (Ft)	4.64
gal/Ft of casing: (0.163) 0.653		Casing Volume (gal)	0.76
Pump Intake Depth	74.00	Screen Interval	64-74
Stable DTW (FTOC):	71.94	Measured Stickup	3ft.

Method of Purging (circle one)

Pump: SUB (BLDR) PERIST OTHER:	Bailer: TEFLON SS OTHER:
Pump Type: QED Flow Rate (gpm): 0.06	Required Pulls: Bailer Vol. (gals): 0.25/ 0.33
Pump Time: ~2hrs Vol. Purged (gals): 1.7	Vol Purged (gals):

Criteria for Stable Parameters

Parameter	*Working Range*	*Stability Criteria*	*Depth to Water Stabilization*	
			Time	DTW
Temperature	>0.00 °C	± 1.0 °C	1235	71.94
pH	0-14	± 0.2	1240	71.94
Conductivity	0-9.99 S/m	± 3%	1245	71.94
Dissolved Oxygen	0-19.99 mg/L	± 10%	1250	71.94
Turbidity	0-800 NTU	± 10% (≥10 NTU)		

Instrument Observations

Round	*Time*	*Water Level (ft BTOC)*	*Volume Purged (gallons)*	*pH*	*Cond (mS/cm)*	*Turbidity (NTU)*	*DO (mg/L)*	*Temp (C)*	*ORP (mV)*	
1	1235	71.97	~0.5	7.29	0.647	50.7	4.96	7.4	-45.4	
2	1240	71.94	~0.8	7.31	0.640	41.1	4.67	7.5	-49.8	
3	1245	71.94	~1.1	7.32	0.634	22.6	4.51	7.5	-52.6	
4	1250	71.94	~1.4	7.32	0.628	12.7	4.39	7.4	-53.6	
5	1255	71.94	~1.7	7.31	0.623	9.77	4.56	7.1	-53.2	Sample Collection
6	1300									
7										
8										
9										

Notes: Draw-down should ideally be less than 0.3 feet from the original depth to groundwater. Minimal draw-down achieved and measured by 1) pumping at a low rate (approximately 1 liter/ 3 minutes or 1 gal/min) and 2) continually measuring water levels in the well.

Sensory Observations

Color:	Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor:	None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity:	None, Low, Medium, High, Very Turbid, Heavy Silts

Comments: TURB 267 NTU @ initial. Wait ~~to~~ (1HR) to drop prior to connecting to YSI

* Ferrous iron ~~test kit~~ (JAR) field test collected here: = 2.98 mg/L

JBER GROUNDWATER (LTM/Treat Studies) 9/4/14

0800-JUF TASK: Prep for GW sampling @ CG039. Sampling will include wells related to LTM annual sampling & 4th Quarter Treatability Studies (TS) sampling.

Personnel: Jennifer Ulrich (Frame) (JUF) - Lead, qualified sampler
Mike Landon (ML) - technician

Project Number: 457958.09.JB.05

Weather: overcast, 57°F, dry (am); PM → rain, 54°F

0800: JUF onsite field office. Begin printing site map, organizing paper work & field equipment for day's start at CG039.

0810: ML onsite. Calibrate equipment (YSI) → see calibration form. Load vehicle w/ glassware/sample ware, equipment, ice, etc.
- While packing, notice that 0.45 micron filters did not arrive w/ yesterday's equipment delivery. Will need to get enough for today + a few extra for collection of diss. Fe & Mn @ the site. Contact TTT & place order for 6. Contact DWH to find out when shipment should be anticipated → tomorrow.

1025 - head to TTT to pickup filters

1135 - return to field office. Pickup turbidity meter. Team fills up decon sprayo & has lunch. Conduct H&S briefing.

1225 - head to Poleline road. check in w/ Range Control. Conduct H&S brief.

1250 - onsite CG039 AP-5246. Set up equipment (LTM Well)

1254 - collect DTW: 147.24 & TD: 163.50

1305 - begin purging well. ~~Takes ~40 mins to have~~ (JUF)

1315 - no water in line. Check connections, air pressure, air line

1317 - retry.

1325 - still no water. Pull pump. check connections at pump. Discharge line obstructed by teflon liner being bunched up in tubing. Cut tubing to ~~free~~ (JUF) open line. Reset well & retry.

1345 - begin purge.

1350-~~1400~~ (JUF) water present. Check flow rate ≈ 100 mL/min. Try to increase slightly to ~200 mL/min

1405 - begin collecting parameters.

1425 - parameters stabilize

DTW	pH	Cond (ms/cm)	NTU	DO mg/L	Temp °C	ORP mV
147.24	7.57	0.328	0.95	4.86	5.34	206.8

1430 - collect sample 14Q36G039-AP5246-GW-00 for:
- Chloride/Sulfate
- Nitrite/nitrate
- RSK-175 (methane, ethane, ethene)
- Diss. Fe & Mn
- SW8260C

Rite in the Rain

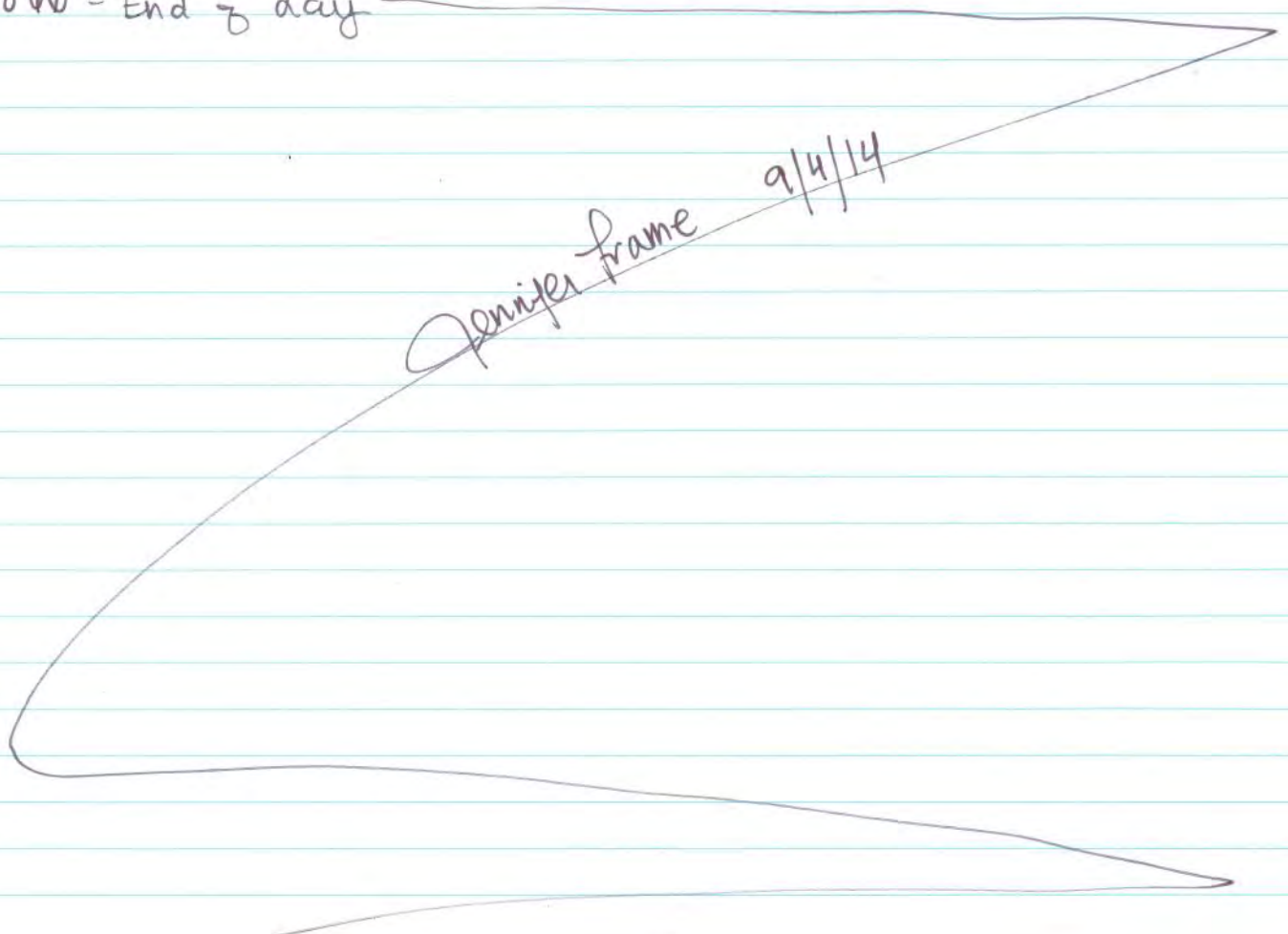
JBER GW LTM/Treat Studies (CG039) 9/4/14

1445 - demobe. Decon pump (3 stages: Wash(liquinox), rinse1, & rinse2)
1505 - finish packing up. move to next location. *Replace lock*
1515 - onsite CG039 AP-5683 (LTM well)
1520 - Collect DTW: 134.54 & TD: 152.50
1527 - begin purging
1546 - water present. Check flow rate ~200 mL/min.
1600 - begin collecting parameters
1620 - parameters stabalize

DTW	pH	mS/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
134.50	7.96	0.205	1.73	3.46	5.33	201.2

1625 - Collect sample 14Q3CG039-AP5683-GW-0 for:
- Chloride/sulfate
- Nitrite/nitrate
- methane, ethane, ethene
- Diss. Fe & Mn
- SW8260C

1640 - decon pump.
1655 - ~~break down~~ (JUF) demobe from site for day. Will ~~continue~~ move to (JUF) AP-3748 tomorrow.
1725 - return to yield office (Checked out w/ Range control). Pack samples for shipment tonight to ASL (JUF will deliver).
1800 - End of day



JBER GW LTM | Treat Studies (CG039) 9/5/14

TASK: continue sampling @ site CG039

Personnel: Jennifer ~~Ulrich (JU)~~ Frame (Ulrich) (JUF) qualified sampler
Mike Landon (ML) - technician

Project Number: 457958.09.JB.05

Weather: Rain, 54°F

0830 - JUF & ML onsite field office. Calibrate YSI (see calibration form) pack for days' sampling effort. Conduct H2S briefing.

0914 - Head to CG039. Call to check in w/ Range control

0925 - onsite CG039 AP-4344 (LTM well)

0935 - collect DTW: 146.86 & TD: 166.00

0946 - begin purging

0958 - water present. Check flow rate ~250 mL/min.

1010 - begin collecting parameters

1100 - parameters stabilize * Turbidity was high initially likely due to pump slipping & hitting bottom of well during setup

DTW	pH	mS/cm Cond	NTU	mg/L *DO	°C Temp	mV ORP
146.86	7.94	0.225	16.0	30.64	5.33	237.6

* DO probe malfunctions ↳ "out of range" try trouble shooting to no avail

1105 - Collect sample 14Q3CG039-AP4344-GW-0 for:
- chloride/sulfate
- Nitrite/nitrate
- methane, ethane, ethene
- Diss. Fe & Mn
- SW8260C

1120 - decon pump. demobe & move to next location

1150 - onsite CG039 AP-3748 (LTM well)

1155 - collect DTW: 130.66 & TD: 174.30

* well has no lock & needs sand in annular space *
Team replaces lock & adds ~3/4 bag of ~~sand~~ (JUF) Pea gravel

1210 - begin purging.

1218 - water present. Check flow rate ~200 mL/min.

1230 - begin collecting parameters

1250 - parameters stabilize

DTW	pH	mS/cm COND	NTU	mg/L DO	°C Temp	mV ORP
130.68	7.65	0.396	13.81	1.49	7.19	230.0

1255 - Collect sample 14Q3CG039-AP3748-GW-0 for:
- same analytes as ~~above~~ (JUF) previous well (AP-4344)

1320 - decon pump. ~~Move to next location~~ (JUF). Change out bladder. Move to next location.

1340 - onsite CG039 AP-3747 (LTM & + Treat Study well [2014 4th Qrt. Only])
* well includes analytes for both LTM & Treat. Studies *

1345 - Collect DTW: 21.19 & TD: 33.60

1347 - begin purge

1348 - water present. Check flow rate ~500 mL/min

JBER GW LTM | Treat Studies 9/5/14

1355 - begin collecting parameters

1410 - parameters stabilize

DTW	pH	mS/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
21.44	7.60	0.212	5.19	1.86	4.71	250.3

1415 - collect sample 14Q3CG039-AP3747-GW-0 for:

- Chloride | sulfate | VFA
- Alkalinity
- Nitrite | nitrate
- Sulfide
- methane, ethane, ethene
- Diss. Fe & Mn
- SW8260C
- TOC SW9060
- * Ferrous iron field test = 0.00 mg/L

1430 - decon pump. Demobe to next location.

1455 - onsite CG039 AP-4353 (LTM well)

1500 - collect DTW: 32.01 & TD: 70.10 * replace well cap *

1510 - begin purge

1514 - water present. Check flow rate ~ 400 mL/min

1520 - begin collecting parameters

1540 - parameters stabilize

DTW	pH	mS/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
33.11	6.76	0.258	0.61	1.5	5.95	-37.2

1545 - collect sample 14Q3CG039-AP4353-GW-0 for:

- chloride | sulfate
- Nitrite | nitrate
- methane, ethane, ethene
- Diss. Fe & Mn
- SW8260C

1550 - decon pump. Demobe from site. Will return to site next Monday.

1610 - checkout of CG039 w/ Range control

1630 - onsite POL yard. Transfer 15 gals of purge water into yellow poly, 55 gal drum & label.

1730 - offsite. End of day

Jennifer Crane 9/5/14

JBER GW LTM/Treat Studies 9/8/14

TASK: Continue LTM/Treatability studies sampling effort at CG039. - LATE ENTRY - Team moved to DA089 in afternoon.

Personnel: Jennifer ~~H~~Frame (Ulrich) (JUF) - qualified sampler, SM
Mike Landon (ML) - technician

Project number: 457958.09.JB.05 (CG039); 457958.09.LC.04 (DA089)

Weather: overcast, ~~et~~ (JUF), 57°F

0800 - JUF onsite TTT to pickup YSI rental. ~~Turbidity~~ (JUF) DO meter on DWH YSI is malfunctioning & cannot be fixed by field trouble shooting efforts. Will return to DWH after talking w/ P. Lundberg (CH2M HILL warehouse contact).

0840 - onsite JBER check point. Vehicle requires search - OK

0900 - onsite field office. ML already onsite. TTT rental YSI was just calibrated this morning by TTT techs, however ML will check to be sure calibrations adequate (see calibration form). JUF packs up supplies/bottleware for sampling.

0930 - JUF discusses YSI problem w/ P. Lundberg (was unable to reach on Friday while trouble-shooting). P. Lundberg will ship out replacement YSI model ~~6820~~ (JUF). This model has up-graded DO probe cover which should be more resiliant & provide less trouble shooting for field team.

1000 - onsite Poleline Rd. Call & check in w/ Range control

1025 - onsite CG039 AP-3744 (+Treat study well [2014 Qrt. 4 only])

1028 - collect DTW: ~~24.89~~ ~~38.70~~ (JUF) 24.89 TD: 38.70

1030 - begin purge

1033 - water present. Check flow rate ~ 400mL/min.

1040 - begin collecting parameters.
* DO reading jumping from 9.8 mg/L to 21.7 mg/L. Check air line & flow through cell for tight fittings/leaks. Nothing visible. No air bubbles in flow through cell or water line.

1045 - reattempt. DO readings still varying substantially.
* call TTT to ask about trouble shooting options. TTT tech indicates that probe calibrated fine today & last Friday. Only potential trouble shooting is to change-out film & solution on probe, though this was done this morning. Team trys to recalibrate.
- DO mg/L: 10.17 %: 99.86

1100 - retry → still jumps. JUF talks w/ Treat Studies PM to assess next step. Team will head back to field office, replace film/solution on probe & head to DA089 to see if problem is resolved

1110 - JUF contacts P. Lundberg & requests a stand alone DO meter also be shipped for field effort to alleviate any further DO reading concerns

Rite in the Rain

JBER GW LTM/Treat Studies 9/8/14

1135 - Contact Range Control & check out @ Poleline Road.
1145 - onsite field office. ML replaces pH 10/solution. Recalibrate. DO mg/L 10.23 (hi). Set up & test w/ clean water run through flow-through cell. Still fluctuating.
~~1220~~ (JUE)
1220 - call TTT. Arrange to have courier deliver replacement YSI. Team will meet courier @ main gate.
1324 - TTT courier onsite. Exchange units. Team will head to DA089 to test rather than heading back to Poleline due to remoteness of site.
1335 - onsite [DA089 AP3870]. New bladder. (LTM well)
1340 - check DTW: 95.94 & TD: 112.10
* well needs replacement interior & outer casing caps, new lock, & sand. Team adds sand & will replace caps & lock upon return to site.
1350 - begin purge
1400 - water present. check flow rate ~ 250 mL/min
1405 - begin collecting parameters. DO appears normal.
1430 - parameters stabilize

DTW	pH	mS/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
95.96	7.12	0.504	63.7	6.24	7.53	2.6

1435 - Collect sample 14Q3DA089-AP3870-GW-0 for:
- sulfate
- nitrite/nitrate
- methane, ethane, ethene
- Diss. Fe & Mn
- VOCs (8260C)

1445 - decon pump. Mobe to next location
1500 - onsite [DA089 AP-3871] (LTM well)
1505 - collect DTW: 106.97 & TD: 122.00
* well requires additional sand/pea gravel in annular space. Team adds*
1517 - begin purge
1523 - water present. check flow rate ~ 250mL/min
1530 - begin parameter collection
1555 - parameters stabilize

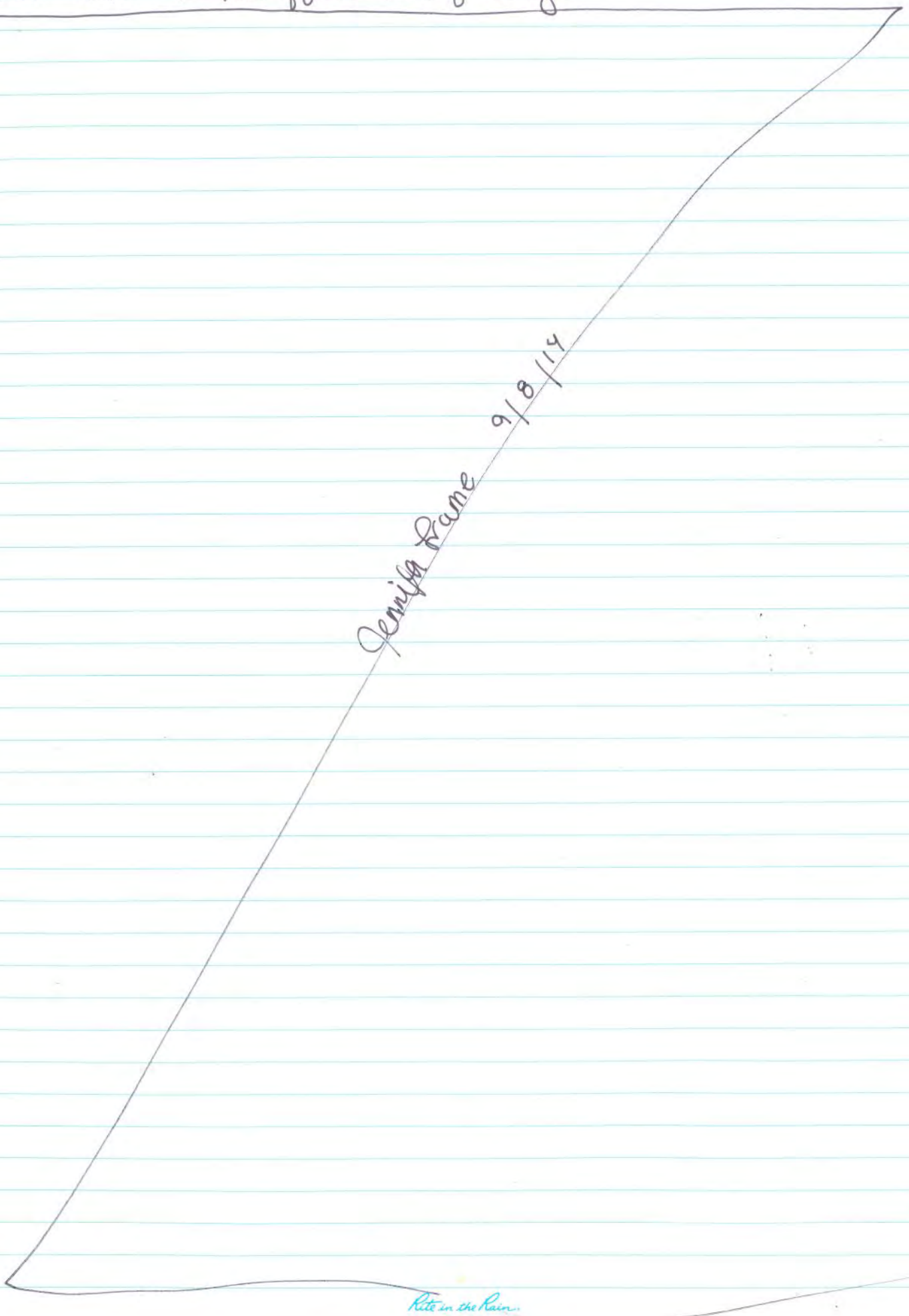
DTW	pH	mS/cm COND	NTU	mg/L DO	°C Temp	mV ORP
106.97	7.36	0.557	16.0	6.06	6.78	-5.7

1600 - Collect sample 14Q3DA089-AP3871-GW-0 for:
- Same analytes as previous location (AP-3870)

1610 - decon pump. Demobe for the day. Samples will be sent on Weds night along w/ Tues & Weds. samples (will remain in site-specific coolers) Team will head back to CG039 tomorrow morning.

JBER GW LTM/Treat Studies 9/8/14

1630 - return to field office. End of day



Rite in the Rain.

JBER GW LTM | Treat Studies 9/9/14

Task: return to CG039 to continue sampling at the site.
Personnel: Jennifer Frame (Ulrich) (JUF) - qualified sampler, and
Mike Landon (ML) - technician
Project Number: 457958.09.JB.05
Weather: overcast, rain, 57°F
0800 - JUF to main ANC office to pickup additional glassware & supplies received from ASL & DWH.
0855 - onsite field office. ML already onsite. Calibrate YSI (see calibration form). All measurements ok. Conduct H&S brief.
0945 - Call Range control to check in to ~~pole~~ JUF Poleline Road.
0958 - Onsite CG039 AP-3744 (+ Treatability Study well [2014 4th Q tonly])
1000 - Collect DTW: 24.90 & TD: 38.71
1008 - begin purge
1012 - water present. Check flow rate ~400 mL/min
1015 - begin collecting parameters
1030 - parameters stabilize

DTW	pH	ms/cm cond	NTU	DO mg/L	°C Temp	mV ORP
24.91	7.08	0.318	6.45	6.92	4.63	6.4

1035 - collect sample 14Q3CG039-AP3744-GW-0 for:
- Chloride, sulfate, VFA
- Alkalinity
- nitrate/nitrite
- sulfide
- methane, ethane, ethene
- Diss. Fe & Mn
- VOCs
- TOCs

* Ferrous iron field test = 0.00 mg/L

1055 - decon pump. Mobe to next location
1115 - onsite ~~CG039 AP-3989~~ JUF CG039 AP-3989 (+ Treat Study well [2014 4th Q])
1120 - Collect DTW: 25.55 & TD: 36.80
* No dedicated tubing present. Team cuts Teflon-lined tubing to fit well. Will leave in well when done
- Added pea gravel to annular space
1132 - begin purge. check flow rate ~250 mL/min
1140 - collect parameters
1205 - parameters stabilize

DTW	pH	ms/cm cond	NTU	mg/L DO	°C Temp	mV ORP
25.66	7.43	0.712	2.02	1.03	5.89	-119.0

1210 - Collect sample 14Q3CG039-AP3989-GW-0 for:
- Same analytes as ~~above~~ JUF previous well

* Ferrous iron field test = 3.30 mg/L

JBER GW LTM / Treatability Studies 9/9/14

1223 - decon pump. Demobe. move to next location.
1235 - onsite CG039 AP-3983R (Treatability Study Well)
1242 - Collect DTW: 23.70 & TD: 45.50
* upon removing tubing, observed thick black coating/staining on outside of tubing. Able to wipe some off, but much is stained. Interval of black staining appears to ~~co~~ JHB correlate to water column length.
1255 - begin purge
1303 - water present. check flow rate ~ 300 mL/min
* black particulate present in water, not impacting NTUs
1310 - begin collecting parameters
1325 - parameters stabilize

DTW	pH	ms/cm cond	NTU	mg/L DO	°C Temp	mV ORP
24.01	7.05	1.362	21.0	1.20	7.34	-94.2

1330 - Collect sample 14Q3CG039-AP3983R-GW-0 for:
• same analytes as previous well
* Ferrous iron field test = 3.30 mg/L
1345 - decon pump. Mobe next location.
1405 - onsite ~~CG039 AP-3983R~~ DUP CG039 AP-4550 (Treat Study Well)
1413 - Collect DTW: 22.63 & TD: 43.50 * White substance (likely EVOs) observed on tubing
1417 - begin purge
1420 - water present. Check flow rate ≈ 400 mL/min
1425 - begin collecting parameters
1450 - parameters stabilize

DTW	pH	ms/cm cond	NTU	mg/L DO	°C Temp	mV ORP
22.65	6.76	0.370	49.2	0.90	6.00	-96.2

1455 - Collect sample 14Q3CG039-AP4550-GW-0
↳ collect MS sample 14Q3CG039-AP4550-GW-0MS
↳ collect MSD sample 14Q3CG039-AP4550-GW-0SD
1500 - collect DUP sample 14Q3CG039-AP4550-GW-1
for:
• Same analytes as previous well
* Ferrous iron field ~~test~~ = 3.01 mg/L
1580 - Decon pump. Demobe for day.
1625 - back to field office.
1645 - end of day

Jennifer Frame 9/9/14

Rite in the Rain

JBER GW LTM | Treat Studies 9/10/14

TASK: Complete GW sampling @ CG039. Conduct water level survey @ CG039. Ship samples. Prep for sampling @ DA089.

Personnel: Jennifer Frame (JUF) → qualified sampler, SM
Annika Seay (AS) → qualified sampler, ~~tech~~ (JUF)
Mike Landon (ML) → technician

Project number: 457958.09.JB.05

Weather: rain, 55°F

0730 - JUF onsite main ANC office to pick up replacement YSI multimeter & DO probe (backup if experience DO issues in field), & additional TBs (original batch had large air bubbles [>pea size] in majority of TBs).

0800 - pick up weather proof labels from Ice Depot.

0805 - drop-off TT YSI rental

0840 - JUF onsite field w/ ice. AS & ML already onsite. Conduct H&S brief. Calibrate New YSI. Pack for days effort. Change out bladder.

0950 - check in w/ Range control

1005 - onsite [CG039 AP-4525] (+ Treat Study [2014 4th Qrt. Only])

~~1035~~ (JUF) / 1015 - collect DTW: 126.58 & TD: 129.00
* no tubing present. Team cuts tubing & dedicates to well.

~~1014~~ (JUF) · Very little water present in well. Will attempt to run bladder pump.

1018 -

~~1040~~ - begin purge. No water in line. Not enough head pressure to pull (intake is @ ~1 ft from bottom of pump).

1038

~~1052~~ - Call Treatability Studies SM, A. Castor to discuss. This well (JUF) was added for additional data & support treatability studies efforts. Team will try bailer to see if any volume can be recovered.

1043 - bailer pulled. ~ 4 inches of water recovered. Water is brown & very turbid. Run in YSI to check ORP, Temp, cond, etc.

1045 - team continues to bail.
- 2nd attempt → no water recovered
- 3rd attempt → no water recovered
- 4th attempt → no water recovered.

1052 - Call Treat Study SM back & relay. Team will move on to next location. Will return to AP-4525 after & try bailing once more.

1105 - onsite [CG039 AP-4551] (Treatability Study well)
- collect DTW: 95.57 & TD: 99.40
* add pea gravel & new lock

1123 - begin purging

1138 - ~~water~~ (JUF) water present. Check flow rate = 100 mL/min

JBER GW LTM/Treat Studies 9/10/14

* Turbidity high (240 NTUs), black particulate present. Will wait for turbidity to drop prior to connecting to YSI.

1148 - Turb. dropped to ~60 NTUs. Connect to YSI.

1150 - ~~bottle~~ (JLE) begin collecting parameter

1215 - parameters stabilize

DTW	pH	mS/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
95.60	7.07	0.508	6.56	1.02	8.3	-41.3

1220 - collect sample 14CQ3CG039-AP4551-GW-0 for:

- Nitrite/nitrate
- sulfide
- Diss Fe & Mn
- VOCs
- TOC
- chloride/sulfate/VFA
- Alkalinity
- Methane, ethane, ethene
- * Ferrous iron field test = 2.97 mg/L

- drop JLE @ field 96 ice

1334 - AS & MH return to CG039 to conduct water level survey

CG039 WL Suevey

DATE	TIME	WELL #	DTW	TOTAL DEPTH	NOTES
9-10-14	1405	AP-3744	24.95	~~38.0~~ 38.2	
↓	1435	AP-3747	21.34	33.20	4" well, needs cap
	1440	AP-3746	130.81	174.0	
	1400	AP-3989	25.54	36.35	
	1105	AP-4525	126.58	129.00	
	1455	AP-4344	147.02	166.34	
	1340	AP-4353	32.07	70.4	
9-10-14	1445	AP-~~4550~~ 5246	147.37	163.15	
9-10-14	1545	AP-~~5246~~ 4550	22.65 (DW)	43.50	
↓	1430	AP-5683	134.69	145.20	
	1425	AP-3745	19.18	30.35	
	1345	AP-3981	20.03	42.0	tubing dropped in well needs fished out
	1410	AP-3982	23.80	37.7	
	1200	~~AP-3983~~ AP-4551	95.60	99.40	
	1500	AP-4350	145.09	191.48	tubing fell in well needs bonded tubing and gravel
	1415	AP-4347	34.90	46.55	
	1450	AP-4349	75.70	85.18	needs bonded tubing and gravel
	1350	AP-3983R	23.74	45.3	

Rite in the Rain

JBER CG039 (ML) 9.10.14

DATE	TIME	WELL #	~~DTW~~	TD	NOTES
~~9-10-14~~		AP-4551			

1355 - Bail AP4525. Record measurements:
Temperature 7.8
SC 575
pH 7.79
ORP 153.8 (ATS)

1500 - Complete CG039 WL Survey. Move to CH field office.
1510 - Arrive at CH field office. Unload Van
~~1515 - ATS moves to TU053 to dig in area to comply with dig permit.~~ (ATS)
1600 - Collect equipment blank 1403CG039-GWEB001 for analysis of:
- E300.0 E300.0M
- E310.1
- E353.2
- E376.2
- RSK175
- SW6010B-DISS
- SW8260C
- SW9060

1630 - Ice samples and prepare to ship.
1700 - ML takes samples to airport. End of day.

9.10.14

JBER GW/LTM Treatability studies 9.11.14

TASK: Continue sampling @ DA089. GW sampling will cover both annual LTM & 4th Qrt. Treatability studies wells.

Personnel: Jennifer Frame (JUF) - Qualified sampler, SM
Annika Seay (AS) - qualified sampler
Mike Landon (ML) - technician

Project Number: 457958.09.LC.04

Weather: clear, 55°F

0900 - onsite yield office. AS onsite. calibrate YSI, pack cooler w/ ice, prep for day's effort.

0920 - ML onsite. Help pack up equipment

1010 - onsite DA089, Black Spruce campground. MW AP-3774 is located in campground behind campsite # 1. Check in w/ campground host to ensure access to well is available. Camp host follows us to site. An RV is parked at site #1. Host checks in w/ RV tenants - no one onsite. Host gives OK to conduct sampling. Team will check out w/ him upon completion

1023 - onsite DA089 AP-3774 (LTM well)

1025 - conduct H&S briefing.

1045 - collect DTW: 103.15 & TD: 116.30
* Add pea gravel to annual space.

1105 - begin purge
- water present. check flow rate ~ 400 mL/min

1120 - begin parameter collection

1135 - parameters stabilized

DTW	pH	Cond mS/cm	NTU	DO mg/L	Temp °C	ORP mV
103.18	7.30	520.9	8.06	6.53	6.5	165.2

1140 - collect sample 1403DA089-AP3774-GW-0 for:
- Sulfate
- nitrite/nitrate
- methane, ethane, ethene
- Diss. Fe & Mn
- VOCs

1150 - Decon pump. Mobe to POL yard to transfer ~ 20 gals

~~1225~~ JUF 1240 - M. Loff site for day

1245 - JUF & AS onsite yield office. Break for lunch

1330 - onsite DA089 ~~AP-3774~~ (LTM well) AP-3486 * replace cap

1357 - Collect DTW: 106.62 & TD: 114.75

1413 - begin purge

1418 - water present. Check flow rate ~ 200 ~~mg/L~~ mL/min.

1425 - begin collecting parameters

Rite in the Rain

JBER GW LTM/Treat Studies 9/11/14

1455 - parameters stabilize

DTW	pH	ms/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
106.69	7.51	5.22	11.6	7.00	8.6	~~200~~.4

1500 - Collect sample 14DA089-AP3468-GW-0 for:
- Same ~~parameters~~ analytes as previous well (AP-3774)

1520 - decon pump. mobe to next location

1540 - onsite DA089 AP-3534 (LTM well)

1542 - collect DTW: 106.19 + TD: 140.00
*replace rusted lock

1550 - begin purge

1605 - begin parameter collection

1620 - parameters stabilize

DTW	pH	ms/cm Cond	NTU	mg/L DO	°C Temp	mV ORP
106.21	7.75	3.79	19.5	5.08	8.0	181.8

1625 - Collect sample 1403DA089-AP3534-GW-0 for:
- same analytes as ~~above~~ previous well.

1650 - decon pump. Demobe for rest of day.

1710 - onsite POL yard to drop garbage.

1730 - return to field office. Pack samples - JUF will ship tonight.

1730 - End of day.

Jennifer Frame 9/11/14

JBER GW LTM/Treat Studies 9/12/14

TASK: Continue GW sampling @ DA089.

Personnel: Jennifer Frame (JMF) - qualified sampler, SM
Annika Seay (AS) - qualified sampler

~~Project Number~~: 457958.09.LC.04

Weather: rain, 52°F, high wind advisory for afternoon

0000 - JMF & AS onsite. Calibrate YSI (see calibration log), Pack for day's effort

0910 - onsite DA089 AP-3893 (LTM Well)

0925 - collect DTW: 84.61 & TD: 124.12

0940 - begin purge

0943 - water present. Check flow rate ~ 250 mL/min

0950 - begin parameter (JMF) collection

1010 - parameters stabilize

DTW	pH	ms/cm cond	NTU	mg/L DO	°C Temp	mV ORP
84.79	8.43	2.56	2.47	0.30	8.1	-67.6

1015 - Collect sample 1403DA089 ~~AP3893~~ (JMF) AP3893-GW-0 for:
- Sulfate
- nitrite~~/~~ nitrate
- methane, ethane, ethene
- Diss Fe & Mn
- VOCs

1050 (JMF) ~~1035~~ decon pump. Mobe to next location

1105 - onsite Bldg. . Check in w/ Bldg mngr. regarding access to well. Site has limited hours: 0700-1530 today.

1108 - onsite ~~DA089 AP-4342~~ (LTM Well) DA089 AP-4411

1110 - collect DTW: 68.— & TD: 72.80

1120 - begin purge

1123 - water present. Check flow rate ~ 150 mL/min.
& water is very turbid. Check NTUs - out of range. will take another turbidity reading in 5 mins. to assess before connecting to YSI

1128 - Turbidity still out of range

1143 - Turbidity dropped to 328 NTUs. Connect to YSI

1150 - begin parameter collection

1205 - parameters stabilize

DTW	pH	ms/cm cond	NTU	mg/L DO	°C Temp	mV ORP

1210 - collect sample 1403DA089-AP4411-GW-0 for: (very low flow)
- Same analytes as previous well.

1240 - decon pump. Return to yard & area. change out bladder

1330 - break for lunch & to address TIT PO & boring log needs

Rite in the Rain

JBER GW LTM / Treat Studies 9/12/14

1455 - onsite DA089 AP-4341 (LTM well)

1510 - Collect DTW: 63.96 ; TD: 68.06 *Add pea gravel to annular space

1530 - begin purge

1533 - water present. Check flow rate ~ 500 mL/min.

1540 - begin parameter collection → (parameters w/ * not stabilized)

1605 - not all parameters stabilize, reach 3x casing volume (2.5 gals)

DTW*	pH	cond (ms/cm)	NTU*	DO* (mg/L)	Temp (°C)	ORP (mv)
	7.67	4.468	37.5	5.77	9.8	178.0

1610 - collect sample 14Q3DA089-AP4341-GW-0 for:

- AK101
- AK102
- Sulfate
- nitrate/nitrite
- methane, ethane, ethene
- Diss. Fe & Mn
- VOCs

1650 - decon pump. Demobe for the weekend

1730 - return to field office. ~~complete for week~~ ~~En-Out~~

~~1800~~ → end of day.

Jennifer Frame 9/12/14

JBER GW LTM | TREAT STUDY 9|15|14

↳ collect MSD sample 14Q3DA089-AP4413-GW-QSD

1305 - Collect DUP sample 14Q3DA089-AP4413-GW-1

+ PRIMARY SAMPLED FOR:
- Sulfate, VFA
- Alkalinity
- nitrite/nitrate
- Sulfide
- methane, ethane, ethene
- Diss. Fe & Mn
- VOCs
- TOC ~~VOC~~ (UF)

+ MS|MSD & FD SAMPLED FOR:
- Sulfate
- nitrite/nitrate
- methane, ethane, ethene
- VOCs

* Ferrous Iron field test = 2.98 mg/L

1410
~~1420~~ (UF) - Decon pump. ~~Retu~~ (UF)
1420 - CONDUCT Water Level Survey for DA089

DA089 Water Level Survey

DATE	TIME	Well ID	DTW (ft bgs)	TD (ft bgs)	NOTES
9|15|14	1205	AP-4413	71.91	76.55	—
	1042	AP-4342	97.10	102.30	—
	1422	AP-4411	68.02	72.80	Access requires check in w/ Bldg. 732 manager
	1430	AP-3534	106.21	140.30	—
	~~1432~~ 1435 (UF)	AP-3468	106.64	116.30	—
	1440	AP-3870	95.98	111.36	Needs new outer casing cap
	1448	AP-3774	103.09	117.90	Needs PVC to be cut & re-surveyed
	1447	AP-3871	107.01	122.13	—
	1500	AP-4341	63.92	69.00	—
	1505	AP-3893	84.61	125.90	Replaced lock

1515 - return to field office. Demobe from DA089 sampling effort

1535 - Collect Equipment Blank sample 14Q3DA089-GWEB01 for:
- AK101
- AK102
- Chloride/sulfate/VFA
- Alkalinity
- nitrite/nitrate
- Diss Fe & Mn
- VOCs
- TOC

1600 - ML offsite

JBER LTM Well maintenance 9/19/14

Task: Perform well maintenance as identified in the 2014 LTM work plan, specifically focusing on wells that have frost-heaved & require PVC to be cut back so well can be secured. ~~Casing was~~ Well will be re-surveyed next week. Sites include DA089, TU101, TU103

Personnel: Mike Landon (ML) - performing maintenance, technician
Jennifer Frame (JUF) - FTL

Project #: DA089: 457958.09.LC.04; TU101: 457958.09.LM.01;
TU103: 457958.09.LQ.01

~~0900 - JUF~~

1005 - MOB TO DA089 AP-3774

1023 - DRILL BIT BROKEN - UNABLE TO CONTINUE
- CALL J. FRAME & NOTIFY
- MOB TO DROP OFF DIG PERMIT (55090) FOR FINAL SIGNATURE
- MOB TO HARDWARE STORE TO GET NEW BIT

1106 - ARRIVE BACK AT AP-3774
- ATTEMPT TO CUT DOWN PVC AGAIN
- SUCCESS

1137 - MOB TO TU103 AP-5014

1150 - ARRIVE @ AP-5014
- FILL W/ PEA GRAVEL (OUTER CASING)
- CUT DOWN PVC & REPLACE FLUSH MOUNT CAP

1227 - MOB TO TU101 AP-3796

1240 - ARRIVE @ TU101
- CUT DOWN WELL CASING & REPLACE CAP
-

9-19-14

Rite in the Rain

APPENDIX B
Land Use Control Inspection Forms

B-1 JBER-Elmendorf LUC Inspection Forms and Photograph Log

B-2 JBER-Richardson LUC Inspection Forms

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B-1 JBER-Elmendorf LUC Inspection Forms and Photograph Log

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JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: DP098 **Inspection Date:** 09/17/14 1030

Site Name: DP098 **Operable Unit:** DP098

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham and H Littlefield

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, varied groundcover, grass, trees, and marsh

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	■ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		■ Yes	☐ No
If yes,			
Dig permit approved?		■ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	■ No
Excavated soil transported off-site?		■ Yes	☐ No
Groundwater encountered during excavation?		■ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	■ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	■ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ■ Routinely Sampled ☐ Good Condition

■ All Required Wells Located ■ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: The lid for the well casing at 41755WL-03 was not able to be bolted on. One bolt was broken off in the casing.

The lid to the well casing for 41755WL-01 was not bolted on. The casing was full of water and requires a new seal and bolts.

Wells 41755WL-01, -02, and -03 are not labeled, and can only be identified from their location on the map. Photos of wells 41755WL-01, -02, and -03 were not possible due to their being located inside the installation fence. Photography is not permitted in this area.

Well 41755WL-08 is frost jacked. Repairs are recommended.

Well 41755WL-07 has minor frost jacking though it is still functional.

Well 41755WL-12 is frost jacked and needs repair.

Site characterization activities occurred.

Photo DP098-1 shows the frost jacked casing on well 41755WL-08.

Photo DP098-2 shows the frost jacked well 41755WL-08.

Photo DP098-3 shows location of DP98SW-01 facing north.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: FT023 **Inspection Date:** 09/16/14 1300

Site Name: Fire Training Area **Operable Unit:** OU4

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Mostly Paved/Developed

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	☐ In Place	☐ Missing	■ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		■ Yes	☐ No
If yes,			
Dig permit approved?		■ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	■ No
Excavated soil transported off-site?		■ Yes	☐ No
Groundwater encountered during excavation?		■ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?			
	■ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ■ Functioning ■ Routinely Sampled ■ Good Condition

■ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: A portion of this site is on the flight line, and therefore has some access controls. Though some general litter was present, it was not relevant to the contaminated site (parking lot). Well GW-5A was secure and in good condition. Site characterization activities occurred.

Photo FT023-1 shows well OU4W-11 secure.

Photo FT023-2 shows well OU4W-11 in good condition.

Photo FT023-3 shows well FP-56 secure.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: LF002 **Inspection Date:** 09/18/14 1410

Site Name: Landfill 002 **Operable Unit:** OU6

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham and A Thompson

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, mature forest

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ■ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls
- ☐ Other _____

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	■ N/A
Gate(s)	☐ Damaged	☐ Secured	■ N/A
Signage	☐ In Place	☐ Missing	■ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

■ All Required Wells Located ■ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Well 53WL-05 is frost jacked and needs to be cut and re-surveyed.
The installation fence on the north side of the site is in good condition.
The gate to the north access road to LF002 is open and cannot be closed due to tree growth around open gate.

Photo LF002-1 shows OU6MW-49R casing secure.

Photo LF002-2 shows well OU6MW-49R in good condition.

Photo LF002-3 shows LF002 Landfill facing west with OU6MW-49R in foreground.

Photo LF002-4 shows well 53WL-05 frost jacked.

Photo LF002-5 shows 53WL-05 well casing and base frost jacked.

Photo LF002-6 shows the north portion of the site, facing east.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: LF003 **Inspection Date:** 09/26/14 0920

Site Name: LF003 Sanitary Landfill **Operable Unit:** OU6

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H. Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Dry, mostly treed, medium groundcover

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ■ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls
- ☐ Other _____

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	☐ Secured	■ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		■ Yes	☐ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ■ Yes ☐ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

☐ All Required Wells Located ☐ Need Maintenance (specify in comments) ■ N/A

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: A bench constructed between two trees within LF003 was found, with a notebook on the bench. Other trash found onsite includes fast food trash, soda cans, and plastic soda bottles.

Photo LF003-1 shows signage on fence.

Photo LF003-2 shows fence along east side of LF003, facing North.

Photo LF003-3 shows bench constructed between two trees.

Photo LF003-4 shows a maintained trail facing west.

Photo LF003-5 shows a maintained trail facing north.

Photo LF003-6 shows trash present.

Photo LF003-7 shows trash present.

Photo LF003-8 shows sledding hill on southeast side of landfill facing northwest.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: LF004 **Inspection Date:** 09/18/14 1410

Site Name: Knik Bluff Landfill **Operable Unit:** OU6

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham and A Thompson

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, overgrown

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ■ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls
- ☐ Other _____

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ■ Functioning ■ Routinely Sampled ■ Good Condition

■ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: The information kiosk is overgrown, and is blank.

Photo LF004-01 shows gate to LF004 secure with signage visible.

Photo LF004-02 shows the access road within LF004 facing south.

Photo LF004-03 shows the access road within LF004 facing south.

Photo LF004-04 shows well OU6MW-92 secure.

Photo LF004-05 shows well OU6MW-63 casing secure.

Photo LF004-06 shows well OU6MW-63 in good condition.

Photo LF004-07 shows the information kiosk overgrown.

Photo LF004-08 shows the information kiosk blank.

Photo LF004-09 shows debris to the south of LF04SP-01 facing east.

Photo LF004-10 shows LF04SP-01 facing southeast.

Photo LF004-11 shows LF04SP-02 facing north.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: LF059 **Inspection Date:** 09/16/14 1430

Site Name: Asphalt Seep **Operable Unit:** OU1

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / L Larsen and H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Mowed Grass

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ■ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	■ N/A
Gate(s)	☐ Damaged	☐ Secured	■ N/A
Signage	☐ In Place	☐ Missing	■ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ■ Routinely Sampled ☐ Good Condition

■ All Required Wells Located ■ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Well LF59MW-04 has no cover or lock, and the outer casing is filled with water. The well is recommended for proper abandonment.

Well LF59MW-05 is not labelled.

Information kiosk is accessible on site and is in good condition.

Photo LF059-1 shows well LF59MW-04, no cover or lock, outer casing filled with water.

Photo LF059-2 shows overview of site LF059 facing east.

LF059-3 shows information kiosk in good condition.

Photo LF059-4 shows information on display at kiosk.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SD015 **Inspection Date:** 09/16/14 1100

Site Name: POL Sludge Disposal #2 **Operable Unit:** OU6

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / L Larsen and H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, overgrown groundcover

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	■ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		☐ Yes	■ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

■ All Required Wells Located ■ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: The gate at the entrance to SD015 is closed and locked with a sign posted.

The concrete base to well OU6MW-71A was found, though no casing or well was found. OU6MW-71A looks to have been abandoned.

Wells OU6MW-17 and OU6MW-90 were secure and in good condition.

Photo SD015-1 shows well OU6MW-90 casing secured and in good condition.

Photo SD015-2 shows well OU6MW-90 in good condition.

Photo SD015-3 shows the gate at the entrance to SD015.

Photo SD015-4 shows the concrete base to well OU6MW-71A.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SD024 **Inspection Date:** 09/26/14 1415

Site Name: Building 15455 Floor Drains **Operable Unit:** OU4

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Dry, Paved/Developed

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	■ In Place	☐ Missing	☐ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		■ Yes	☐ No
If yes,			
Dig permit approved?		■ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	■ No
Excavated soil transported off-site?		■ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	■ No
Did excavation affect the integrity and function of any landfill caps?	■ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	■ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

Despite excavation for utilities service at western corner of SD024, there is no indication that LUCs are not being enforced. The proper paperwork was in order for the utility excavation, dig permit # 242. See SD024 Site Map for underground utilities work area.

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

☐ All Required Wells Located ☐ Need Maintenance (specify in comments) ■ N/A

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Building 15455 is on the flight line, which has strict access controls. Building 15455 is secured. A passcode is required for entry.

Utility work is being done near the western corner of SD024. A pile of soil remains.

Photo SD024-1 shows the front of building 15455 facing SW.

Photo SD024-2 is a view of the earthwork facing west.

Photo SD024-3 shows the southeast portion of SD024 facing NE.

Photo SD024-4 shows the northeast side of SD024 facing SE.

Photo SD024-5 shows the rear of building 15455 facing NW.

N

0 70 140 280
Feet

SD024 SITE MAP

Figure
1

United States Air Force
Joint Base Elmendorf-Richardson, Alaska

Plot Date: 17 Oct 2014 Created by: SJ K:\PROJECTS\Air_Force\JBER\MXDs\2014\2014_JBER_SD024_Markup_Map.mxd

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SD025 **Inspection Date:** 09/19/14 1045

Site Name: Building 16430 Floor Drains **Operable Unit:** OU4

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, Paved/Developed

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	■ In Place	☐ Missing	☐ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

☐ All Required Wells Located ☐ Need Maintenance (specify in comments) ■ N/A

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Building 16430 is on the flight line, which has strict access controls. Building 16430 is secured. A passcode is required for entry.

Photo SD025-1 shows the north side of Building 16430 facing west.

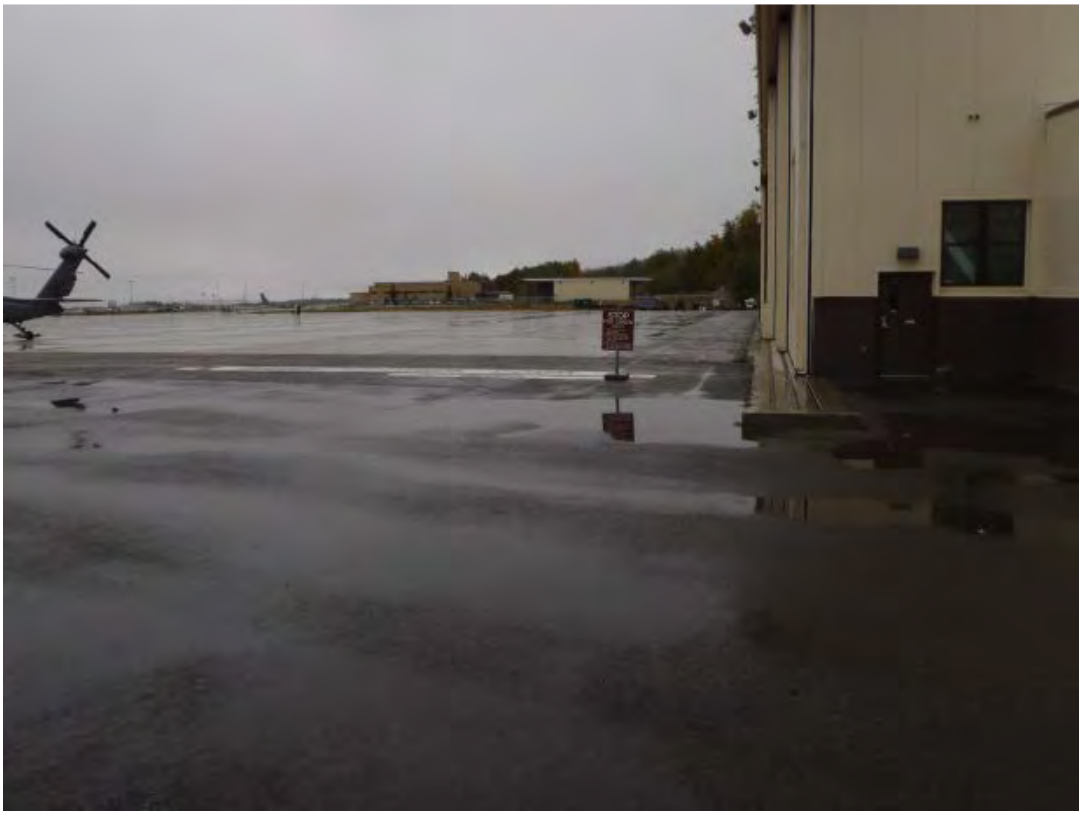

Photo SD025-2 shows the south side of Building 16430 facing west.

Photo SD025-3 shows the west side of Building 16430 facing south.

Photo SD025-4 shows well OU4MW-08R.

Photo SD025-5 shows area of Hangar 11 Plume with well OU4MW-08R in the foreground.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SD029 **Inspection Date:** 09/22/14 1140

Site Name: Building 16716 **Operable Unit:** OU4

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Dry paved/developed

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	■ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	■ In Place	☐ Missing	☐ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		■ Yes	☐ No
If yes,			
Dig permit approved?		■ Yes	☐ No
Excavated soil used on-site for backfill?		■ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	■ No
Groundwater encountered during excavation?		☐ Yes	■ No
Did excavation affect the integrity and function of any landfill caps?	■ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ■ Good Condition

■ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Building 16716 is within flight line, which has strict access controls. Communication lines were installed to Hangar 15.

Photo SD029-1 shows monitoring well IS6-01 secure.

Photo SD029-2 shows west side of SD029 facing north.

Photo SD029-3 shows south side of SD029 facing east.

Photo SD029-4 shows east side of SD029 facing north.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: ST037 **Inspection Date:** 09/18/14 1030

Site Name: Diesel Fuel Line Leak **Operable Unit:** OU5

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / L Larsen and H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, varied terrain and groundcover

Remedy Includes: (check all that apply)

- ■ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ■ Other OU5 Wetland Treatment System
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	■ Intact	☐ N/A
Gate(s)	☐ Damaged	■ Secured	☐ N/A
Signage	☐ In Place	☐ Missing	■ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ■ Good Condition

■ All Required Wells Located ■ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ■ Needs Maintenance (specify in comments) ☐ N/A

Comments: More gravel is needed in the Seep 1 collection area.

Well OU5MW-40 casing lid is broken and will not lock, but well cap is locked in place and is secure.

Trees cut under the power lines behind the seep 1 collection area look to have been cut to keep the branches off the power lines. This should not affect the OU5 WRS.

The weir was cleared of debris after 2 beavers were removed on 15 September 2014.

There is an area off the railroad access road to the AF leased land, east of pump station 1, which shows surface soil movement activity. The reason for this is not clear but it does not affect the OU5 WRS.

The information kiosk is accessible and in good condition.

Wells OU5MW-09, NS3-2, and OU5MW-13, which were found to be frost-heaved in spring of 2014, were cut and resurveyed on 10 September 2014.

Photo ST037-01 shows well OU5MW-02 casing secure.

Photo ST037-02 shows well OU5MW-02 in good condition. Bollards are crooked but secure.

Photo ST037-03 shows well OU5MW-37 secure.

Photo ST037-04 shows the residential common area/playground near OU5MW-37, facing west.

Photo ST037-05 shows well OU5MW-40.

Photo ST037-06 shows trees cut behind the seep 1 collection area.

Photo ST037-07 shows the OU5 wetland cell facing NE.

Photo ST037-08 shows the OU5 wetland cell facing NE.

Photo ST037-09 shows the former railroad access road gate, facing NE.

Photo ST037-10 is overlooking the OU5 wetland treatment cell, facing south.

Photo ST037-11 shows the former overland flow cell, facing north.

Photo ST037-12 shows the secure gate to the former overland flow cell, facing SE.

Photo ST037-13 shows surface movement activities east of pump station 1.

Photo ST037-14 shows surface movement activities east of pump station 1.

Photo ST037-15 shows soil movement activities east of pump station 1.

Photo ST037-16 shows the first panel at the information kiosk.

Photo ST037-17 shows the second panel at the information kiosk.

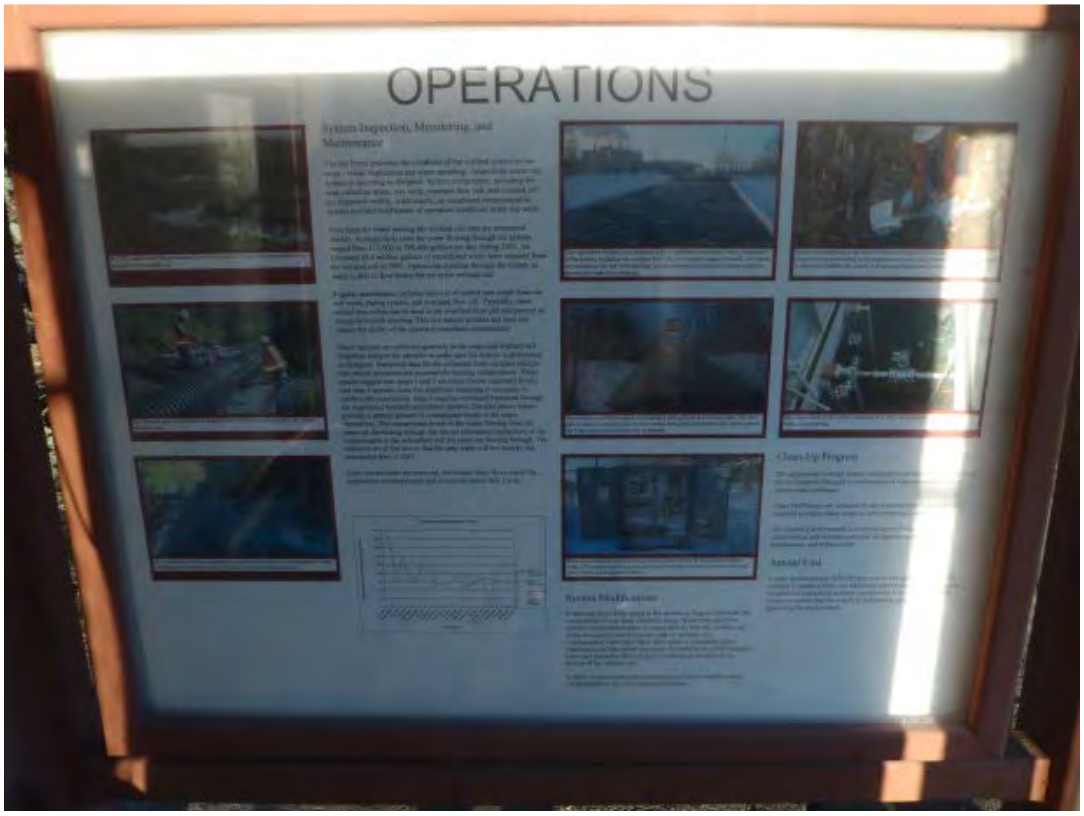

Photo ST037-18 shows the third panel at the information kiosk.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: ST041 **Inspection Date:** 09/26/14 1145

Site Name: Four Million Gallon Hill **Operable Unit:** OU2

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Marsh/Dry, varied land use

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	■ N/A
Gate(s)	☐ Damaged	☐ Secured	■ N/A
Signage	☐ In Place	☐ Missing	■ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■☐ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No
Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?		☐ Yes	■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ■ Functioning ■ Routinely Sampled ■ Good Condition

☐ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Could not locate ST41-34 and ST41SW-30 due to deep marshy area and overgrown groundcover.

The information kiosk is accessible on site, and is in good condition.

Well ST41-25, which was found to be frost-heaved in 2013, was cut and resurveyed on 10 September 2014.

Photo ST041-1 shows well ST41-20 secure, with the casing frost jacked.

Photo ST041-2 shows well ST41-20 which seems to be in good condition.

Photo ST041-3 shows view of ST041 from top of hill facing NE.

Photo ST041-4 shows view of ST041 from top of hill facing south.

Photo ST041-5 shows view downhill, facing south, with ST41-16 being the nearer well, and ST41-25 being the more distant well across the road.

Photo ST041-6 shows information kiosk in good condition.

Photo ST041-7 shows information on display at kiosk.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: WP014 **Inspection Date:** 09/26/14 1110

Site Name: POL Sludge Disposal **Operable Unit:** OU6

Company/Personnel Conducting Inspection: Weston Solutions, Inc. / H Graham

JBER RPM Review of Dig Permits: Don Aide

Ground Conditions (wet, snow covered): Wet, Overgrown

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ■ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ■ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	■ No
If yes,		
Were residential facilities constructed?	☐ Yes	■ No
Were manned industrial facilities constructed?	☐ Yes	■ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	■ N/A
Gate(s)	☐ Damaged	☐ Secured	■ N/A
Signage	☐ In Place	☐ Missing	■ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	■ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	■ No
Vandalism evident (specify in comments)		☐ Yes	■ No
Soil excavated in the past 12 months?		☐ Yes	■ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	■ No

If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination? ☐ Yes ☐ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose? ☐ Yes ■ No

Soil LUC applies to this site		■ Yes	☐ No
Groundwater LUC applies to this site		■ Yes	☐ No
Site conditions imply LUCs being enforced	☐ Not Applicable	■ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ■ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

■ Properly Secured/Locked ☐ Functioning ■ Routinely Sampled ☐ Good Condition

■ All Required Wells Located ■ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ■ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ■ N/A

Comments: Well OU6MW-05 is damaged. There is no sign of the well inside the casing.

Photo WP014-1 shows well 14MW-120 secure.

Photo WP014-2 shows well 14MW-120 in good condition.

Photo WP014-3 shows well 14MW-121 secure.

Photo WP014-4 shows well 14MW-121 in good condition.

Photo WP014-5 shows well OU6MW-05 damaged.

Photo WP014-6 shows well OU6MW-46 secure. Temporary fence is leaning against well.

Photo WP014-7 shows a representative view of WP014 facing west.

B-2 JBER-Richardson LUC Inspection Forms

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JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: XU022 and XE023 **Inspection Date:** 2014 August 20

Site Name: Eagle River Flats and EOD Pad (OUC) **Operable Unit:** OUC

JBER RPM Review of Dig Permits: Don Aide

Agency or Company Conducting Inspection: CH2M HILL

Ground Conditions (wet, snow covered): Dry

Remedy Includes: (check all that apply)

- ☒ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ☒ Institutional Controls
- ☒ Other: Specialized Training for Site Access
- ☐ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	☒ No
If yes,		
Were residential facilities constructed?	☐ Yes	☒ No
Were manned industrial facilities constructed?	☐ Yes	☒ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	☒ N/A
Gate(s)	☐ Damaged	☒ Secured	☐ N/A
Signage	☒ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	☒ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	☒ No
Vandalism evident (specify in comments)		☐ Yes	☒ No
Soil excavated in the past 12 months?		☐ Yes	☒ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	☒ No

If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?

☐ Yes ☐ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose?

☐ Yes ☒ No

Soil LUC applies to this site[1]		☒ Yes	☐ No
Groundwater LUC applies to this site		☐ Yes	☒ No
Site conditions imply LUCs being enforced	☐ Not Applicable	☐ Yes	☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ☒ No

GROUNDWATER/SURFACE WATER REMEDIES ☒ N/A

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

☐ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ☒ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ☒ N/A

Comments: Monitoring wells are present at XE023 but long-term groundwater monitoring and LUCs for groundwater are not part of the selected remedy. Wells will be inspected in 2016 (following clearance of the area for potential unexploded ordnance concurrent with work planned for XU022). The 2014 visual inspection was from outside of the gate due to access controls.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: CG039 **Inspection Date:** 09/04/14

Site Name: Poleline Road **Operable Unit:** B

JBER RPM Review of Dig Permits: Don Aide

Agency or Company Conducting Inspection: CH2M HILL

Ground Conditions (wet, snow covered): Wet

Remedy Includes: (check all that apply)

- ☒ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ☒ Institutional Controls
- ☐ Other _____
- ☐ Landfill Cover/Containment
- ☒ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	☒ No
If yes,		
Were residential facilities constructed?	☐ Yes	☐ No
Were manned industrial facilities constructed?	☐ Yes	☐ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☒ Intact	☐ N/A
Gate(s)	☐ Damaged	☒ Secured	☐ N/A
Signage	**(1)** ☒ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	☒ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	☒ No
Vandalism evident (specify in comments)		☐ Yes	☒ No
Soil excavated in the past 12 months?		☐ Yes	☒ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	☒ No

If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?

☐ Yes ☒ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose? ☐ Yes ☒ No

Soil LUC applies to this site ☒ Yes ☐ No

Groundwater LUC applies to this site ☒ Yes ☐ No

Site conditions imply LUCs being enforced ☐ Not Applicable ☒ Yes ☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ☒ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells (2.)

☒ Properly Secured/Locked ☒ Functioning ☒ Routinely Sampled ☒ Good Condition

☒ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ☒ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ☒ N/A

Comments: 1.) Large information sign providing details about SVE system & contamination at the site is in disrepair. Though it has been re-hung, much of the sign is fading, peeling, or missing. Additional signs indicating hazards at the site for other access points will be hung at a later time. CH2M HILL is working w/AF to have them made.

2.) CH2M HILL team addressed the following maintenance issues during this inspection:

-Sand was added to the annular space of AP-3748, cap & lock was replaced

-caps & locks were replaced at the following locations: AP-3985, AP-4551, AP-3986.

All wells are secure.

Photograph CG039-1: Closeup of monitoring well AP-3985 with new lock and cap.

Photograph CG039-2: Closeup of monitoring well AP-3986 with new lock and cap.

Photograph CG039-3: Closeup of monitoring well AP-4551 with new lock and cap.

Photograph CG039-4: View of Poleline Road informational sign re-hung at entry to site.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: DA089 **Inspection Date:** 06/06/14 & 10/10/14

Site Name: AVMA **Operable Unit:** E

JBER RPM Review of Dig Permits: Don Aide

Agency or Company Conducting Inspection: CH2M HILL

Ground Conditions (wet, snow covered): Dry

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ☒ Institutional Controls
- ☐ Other
- ☐ Landfill Cover/Containment
- ☒ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	**(1.)** ☒ No
If yes,		
Were residential facilities constructed?	☐ Yes	☒ No
Were manned industrial facilities constructed?	☐ Yes	☒ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	☒ N/A
Gate(s)	☐ Damaged	☐ Secured	☒ N/A
Signage	☐ In Place	☐ Missing	☒ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	☒ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	☒ No
Vandalism evident (specify in comments)		☐ Yes	☒ No
Soil excavated in the past 12 months?		☐ Yes	☒ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		**(1.)** ☒ Yes	☐ No

If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?

☐ Yes ☒ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose? ☐ Yes ☒ No

Soil LUC applies to this site ☒ Yes ☒ No

Groundwater LUC applies to this site ☐ Yes ☒ No

Site conditions imply LUCs being enforced ☐ Not Applicable ☒ Yes ☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ☒ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☒ Properly Secured/Locked ☒ Functioning ☒ Routinely Sampled ☒ Good Condition

☒ All Required Wells Located ☒ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ☒ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ☒ N/A

Comments: 1.) Interviewed bldg. mngr. no land-use changes, residential facilities, or manned industrial facilities constructed in past 12 months.

2.) 4 injection wells & 1 radius of influence well were installed at the site in August, 2013 as part of the Treatability Study. IDW was transferred to the JBER POL facility.

3.) 1 of 3 bollards @ well AP-3870 has been hit. Still standing, but dented.

4.) MW AP-3468 is dry & needs a new well cap.

5.) MW AP-3534 lock is rusted & needs to be replaced.

6.) MW AP-3774 well monument is loose.

*Follow-up inspection on 10/10/14. The following maintenance activities we performed:

- Sand was added to the annular space of AP-4413

-Additional was added to the annular space of AP-4341. The well cap was also replaced. The bollard previously identified as needing repair did not appear to compromise the integrity/safety of the well. Bollard was not replaced.

- Well caps were replaced at the following locations: AP-3486, AP-3870

- The lock was replaced at AP-3534

-Bentonite & sand observed in the annular space of well AP-4411 was cleaned out

-The well casing at well AP-3774 was cut back to be below TOC of outer casing so that well could be properly secured. Sand was added to the annular space. * Well casing was re-surveyed on 10/02/14

Photograph DA089-1: Secured monitor well AP-3774. PVC riser was cut after having frost heaved, to allow interior and exterior cap to be properly secured in 2014.

Photograph DA089-2: Newly replaced exterior cap at monitor well AP-3870 facing west. The bollard to the south is bent, however well is not located in high traffic area.

Photograph DA089-3: Newly replaced lock at monitor well AP-4341 facing west.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SS013 **Inspection Date:** 11/5/14

Site Name: MP Barracks PCB Site **Operable Unit:** N/A

JBER RPM Review of Dig Permits: Don Aide

Agency or Company Conducting Inspection: CH2M HILL

Ground Conditions (wet, snow covered): Minimal snow

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ☒ Institutional Controls
- ☐ Other
- ☐ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	☒ No
If yes,		
Were residential facilities constructed?	☐ Yes	☒ No
Were manned industrial facilities constructed?	☐ Yes	☒ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	☒ N/A
Gate(s)	☐ Damaged	☐ Secured	☒ N/A
Signage	☐ In Place	☐ Missing	☒ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	☒ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	☒ No
Vandalism evident (specify in comments)		☐ Yes	☒ No
Soil excavated in the past 12 months?		☐ Yes	☒ No
If yes,			
Dig permit approved?		☐ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☐ No
Groundwater encountered during excavation?		☐ Yes	☐ No
Did excavation affect the integrity and function of any landfill caps?	☐ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	☒ No

If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?

☐ Yes ☐ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose? ☐ Yes ☒ No

Soil LUC applies to this site ☒ Yes ☐ No

Groundwater LUC applies to this site ☐ Yes ☒ No

Site conditions imply LUCs being enforced ☐ Not Applicable ☒ Yes ☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ☒ No

GROUNDWATER/SURFACE WATER REMEDIES ☒ N/A

Monitoring Wells

☐ Properly Secured/Locked ☐ Functioning ☐ Routinely Sampled ☐ Good Condition

☐ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ☒ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ☒ N/A

Comments: Site is on the south side of an active barracks. Heavy foot traffic and use of lawn, but no disturbance to soil cap observed.

Photograph SS013-1: Overview of Site facing west

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SS044 **Inspection Date:** 07/31/14

Site Name: PCB site 35-752 **Operable Unit:** E

JBER RPM Review of Dig Permits: Don Aide

Agency or Company Conducting Inspection: CH2M HILL

Ground Conditions (wet, snow covered): Dry

Remedy Includes: (check all that apply)

- ☒ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ☒ Institutional Controls
- ☐ Other
- ☐ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	☒ No
If yes,		
Were residential facilities constructed?	☐ Yes	☒ No
Were manned industrial facilities constructed?	☐ Yes	☒ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☒ Intact	☐ N/A
Gate(s)	☐ Damaged	☒ Secured	☐ N/A
Signage	☒ In Place	☐ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	☒ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	☒ No
Vandalism evident (specify in comments)		☐ Yes	☒ No
Soil excavated in the past 12 months?		☒ Yes	☐ No
If yes,			
Dig permit approved?		☒ Yes	☐ No
Excavated soil used on-site for backfill?		☐ Yes	☒ No
Excavated soil transported off-site?		☐ Yes	☒ No
Groundwater encountered during excavation?		☐ Yes	☒ No
Did excavation affect the integrity and function of any landfill caps?	☒ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	☒ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose? ☐Yes ☒ No

Soil LUC applies to this site ☒ Yes ☐ No

Groundwater LUC applies to this site ☒ Yes ☐ No

Site conditions imply LUCs being enforced ☐ Not Applicable ☒ Yes ☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ☒ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☒ Properly Secured/Locked Condition ☒ Functioning ☐ Routinely Sampled ☒ Good Condition

☒ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ☒ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ☒ N/A

Comments: 1.) MW's AP-3458, AP-3920, AP-3503, AP-2987, AP-2983, AP-2984, AP-2985, AP-2986, AP-3232 were decommissioned by CH2M HILL in late July, 2014. MW AP-3918 was also decommissioned on 8/11/14. The following wells were left in place in case of further monitoring needs: AP-3231 & AP-2982.

No soil was excavated during decommissioning activities, but dig permit was obtained prior to work.

Photo SS044-1: Building 35-752 with fence and Keep Out signage, facing south.

JBER Annual LUC/IC and Site Inspection Checklist

SITE INFORMATION

Site ID: SS090 **Inspection Date:** 10/10/14

Site Name: Dieldrin Spill Site (Barracks Construction) **Operable Unit: N/A**

JBER RPM Review of Dig Permits: Don Aide

Agency or Company Conducting Inspection: CH2M HILL

Ground Conditions (wet, snow covered): Wet

Remedy Includes: (check all that apply)

- ☐ Access Controls
- ☐ Groundwater Containment
- ☐ Groundwater Pumping and Treatment
- ☒ Institutional Controls
- ☒ Other: Geotextile Soil Cover
- ☐ Landfill Cover/Containment
- ☐ Monitored Natural Attenuation
- ☐ Surface Water Collection and Treatment
- ☐ Vertical Barrier Walls

LAND USE

On-site land use changes in past 12 months? (specify in comments)	☐ Yes	☒ No
If yes,		
Were residential facilities constructed?	☐ Yes	☒ No
Were manned industrial facilities constructed?	☐ Yes	☒ No

ACCESS AND INSTITUTIONAL CONTROLS (show location on a site map)

Fencing	☐ Damaged	☐ Intact	☒ N/A
Gate(s)	☐ Damaged	☐ Secured	☒ N/A
Signage	☐ In Place	☒ Missing	☐ N/A
Other Security Measures (specify in comments)	☐ In Place	☐ Missing	☒ N/A
Evidence of possible trespass (specify in comments)		☐ Yes	☒ No
Vandalism evident (specify in comments)		☐ Yes	☒ No
Soil excavated in the past 12 months? **(1.)**		☒ Yes	☐ No
If yes,			
Dig permit approved?		☒ Yes	☐ No
Excavated soil used on-site for backfill? **(2.)**		☒ Yes	☐ No
Excavated soil transported off-site?		☐ Yes	☒ No
Groundwater encountered during excavation?		☐ Yes	☒ No
Did excavation affect the integrity and function of any landfill caps?	☒ N/A	☐ Yes	☐ No
Any wells installed in past 12 months?		☐ Yes	☒ No
If yes, did drilling through the shallow aquifer into the confined aquifer occur without AFCEC review of engineering controls and methods to prevent cross-contamination?		☐ Yes	☐ No

Is groundwater from this site used for drinking, irrigation, fire control, dust control, or any other purpose? ☐ Yes ☒ No

Soil LUC applies to this site ☒ Yes ☐ No

Groundwater LUC applies to this site ☒ Yes ☐ No

Site conditions imply LUCs being enforced ☐ Not Applicable ☒ Yes ☐ No

If ICs/LUCs not enforced, explain below:

GENERAL SITE CONDITIONS

Clutter or Trash Present ☐ Yes ☒ No

GROUNDWATER/SURFACE WATER REMEDIES

Monitoring Wells

☒ Properly Secured/Locked ☒ Functioning ☒ Routinely Sampled ☒ Good Condition

☒ All Required Wells Located ☐ Need Maintenance (specify in comments)

Groundwater Extraction Wells, Pumps, Pipelines, Wellhead Plumbing, and Electrical

☐ Good Condition ☐ All Required Wells Properly Operating ☒ N/A

☐ Need Maintenance (specify in comments)

Surface Water Collection Structures, Pumps, Pipelines, and Electrical

☐ Good condition ☐ Needs Maintenance (specify in comments) ☒ N/A

Comments: 1.) CH2M HILL installed 8 bollards at the site on 9/24/14 to protect the cap from damage. The appropriate dig permit was approved prior to intrusive work.

2.) Bollard installation did not generate any soil cuttings. Method of placement disperses soil rather than removing.

3) Liner repaired

Photo SS090-1: Bollards around Dieldrin site, facing southeast.

APPENDIX C

Laboratory Analytical Data Reports
Mann-Kendall Trend Test Analysis Records
Analytical Data QA/QC Summary Reports
ADEC Laboratory Data Review Checklists

C1 JBER-Elmendorf

- Analytical Laboratory Data Reports (on CD only)
- Analytical Data QA/QC Summary Report
- ADEC Laboratory Data Review Checklists
- Mann-Kendall Trend Test Analysis Records

C2 JBER-Richardson

- Analytical Laboratory Data Reports (on CD only)
- Analytical Data QA/QC Summary Report
- ADEC Laboratory Data Review Checklists

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C-1 JBER-Elmendorf

- Analytical Laboratory Data Reports (on CD only)
- Analytical Data QA/QC Summary Report
- ADEC Laboratory Data Review Checklists
- Mann- Kendall Trend Test Analysis Records

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QA/QC SUMMARY REPORT

1.0 INTRODUCTION

This Quality Assurance/Quality Control (QA/QC) Report summarizes the evaluation of laboratory data collected to support the 2014 annual monitoring and long-term management (LTM) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated sites at Joint Base Elmendorf-Richardson (JBER), Alaska. These data have been reviewed and validated to evaluate compliance with QA/QC criteria based on data quality objectives (DQOs) specified in the *2014 Remedial Action-Operations and Monitoring Letter Work Plan Addendum* (U.S. Air Force [USAF], 2014a) and the *JBER Basewide UFP-QAPP* (USAF, 2014b).

Appendix C to the *2014 Annual Field Activities Report* includes this QA/QC Summary Report; a sample summary, including all samples collected and submitted to the laboratory for the associated sample delivery groups (SDGs); the Alaska Department of Environmental Conservation (ADEC) Laboratory Data Review Checklists for each SDG; and the analytical laboratory reports for each SDG (provided in electronic format).

The data quality review, verification, and validation were performed to assess the overall quality and usability of the data collected to support long-term monitoring at CERCLA-regulated sites on JBER. Acceptance criteria for this project are specified in the *JBER Basewide UFP-QAPP* (USAF, 2014b); the accepted analytical methods; and the analytical laboratory standard operating procedures (SOPs). Non-conformances of data are identified, discussed, and qualified in this report. Any potential bias resulting from the data quality issue identified by a qualifier is discussed in this report. When possible, direction of potential bias is assigned.

2.0 DATA REVIEW, VERIFICATION, VALIDATION, AND QUALIFICATION

Data review, verification, and validation were performed by an experienced quality assurance chemist independent of the analytical laboratory not directly involved with the project, following the procedures described in Worksheets #34 through #37 of the *Basewide UFP-QAPP* (USAF, 2014b). This evaluation included, but was not limited to, a review of chain-of-custody (CoC) and sample receipt records; laboratory case narratives; laboratory data including analytical methodology, sample holding times, and quality control samples; detection limits (DL), limits of detection (LOD), and limits of quantitation (LOQ); and precision. Analytical DQOs were considered met when the quality of the sample data met the precision, accuracy, representativeness, completeness, comparability, and sensitivity requirements specified in the *Basewide UFP-QAPP* (USAF, 2014b).

Qualifiers applied to the analytical data set, as appropriate, included the following:

- R – The data are rejected because of deficiencies in meeting QC criteria and may not be used for decision making.
- B – The analyte was detected in the sample at a concentration less than or equal to five times the amount found in the method blank (ten times for common laboratory contaminants).
- J – The analyte was positively identified, and the quantitation is an estimated because of discrepancies in meeting certain analyte-specific QC criteria; or the analyte was positively identified, but the associated concentration is estimated greater than or equal to the DL and below the LOQ.
- UJ – The analyte was not detected; however, the result is estimated because of discrepancies in meeting certain analyte-specific QC criteria.
- U – The constituent was analyzed for, but not detected.

The allowable final data qualifiers for definitive data and the hierarchy of data qualifiers listed in order of the most severe through the least severe are R, B, J, UJ, and U.

The following information was reviewed as part of the data validation:

- Sample handling and CoC;
- Sample preservation and holding time compliance;
- Field QC samples (including trip blanks and field duplicates);
- Laboratory reporting limits, including DL, LOD, and LOQ;
- Method blank (MB) sample recovery;
- Laboratory control sample (LCS) and LCS duplicate (LCSD) recoveries;
- Surrogate spike recoveries;
- Matrix spike (MS) and MS duplicate (MSD) recoveries;
- Initial and continuing calibration summary information;
- Internal standards performance (gas chromatography-mass spectrometry [GC-MS]);
- Precision, including relative percent difference values for duplicate analyses;
- Case narrative review, laboratory flagging review, and other analytical method-specific criteria; and
- Completeness.

3.0 DATA QUALITY SUMMARY

All samples collected for this project are included in the sample summary. TestAmerica Laboratories of West Sacramento, California (TA) and SGS North America, Inc. (SGS) performed chemical analyses for all parameters in accordance with the *Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories* (DoD, 2010). Samples were prepared and analyzed in accordance with analytical methods specified in *Test Methods for Evaluating Solid Waste SW-846* (U.S. Environmental Protection Agency [EPA], 2007); *Underground Storage Tanks Procedures Manual* (ADEC, 2002); and laboratory standard operating procedures (SOPs).

A review and assessment of the analytical results and associated QC samples found the overall quality of the project data to be acceptable. Results of this evaluation are provided in the following sections.

3.1 Sample Handling and Chain-of-Custody

CoC forms and laboratory case narratives were reviewed to assess sample handling procedures that may affect the integrity of the samples and quality of the resulting data. Copies of CoCs and cooler receipt forms were included in the data deliverables from the laboratories.

Samples were packed with frozen gel packs and hand-delivered to SGS for analysis, or the TA laboratory in Anchorage, Alaska for repackaging and shipment to TestAmerica in West Sacramento, California. CoC forms, cooler receipt documentation, and laboratory case narratives were reviewed to determine if any sample handling procedures might affect the integrity of the samples and the quality of the resulting data. These included handling issues such as temperature blank and ambient cooler temperatures, holding times, and container integrity. All project UFP-QAPP requirements were met, except as noted in Section 4.0.

3.2 Sample Preservation and Holding Time Compliance

All samples were extracted and/or analyzed within the recommended hold time and were properly preserved for the analytical procedures utilized for this project, except as noted in Section 4.0.

3.3 Trip Blank Sample Analysis

Trip blanks were shipped with each cooler for each shipment containing samples for volatile analyses. Results from trip blank analyses were evaluated to assess whether samples were contaminated by VOCs during sample handling and transport to the laboratory.

Analytes detected in the trip blanks at levels greater than the DL concentration are noted in Section 4.0.

3.4 Laboratory Reporting Limits

Laboratory-specific DLs, LODs, and LOQs were evaluated against the project action limits, cleanup levels, and/or screening criteria to determine whether the sensitivity of the data is sufficient for its intended use. Project-required DLs, LODs, and LOQs are included in Worksheet #15 of the Basewide UFP-QAPP.

Unless dilution was required during analysis due to high concentrations of method-specific analytes, the laboratory DLs, LODs, and LOQs achieved by the laboratory met the project objectives. Nondetect sample results with laboratory DL, LOD, or LOQ that exceeds the project-specific action limits, cleanup levels, and/or screening criteria are discussed in Section 4.0.

3.5 Method Blank Sample Recovery

Method blank samples are prepared and analyzed concurrently with each batch of 20 or fewer samples for each analytical procedure performed for this project. These samples are prepared in the laboratory in conjunction with field samples to monitor for potential introduction of contamination during the laboratory analytical procedure.

For this project, method blank samples were analyzed at the required frequency. Analytes detected in a method blank that required results to be qualified are noted in Section 4.0.

3.6 Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis

LCS samples (and LCSD samples, if required) are prepared and analyzed concurrently with each batch of 20 or fewer samples. The primary purpose of the LCS is to demonstrate that the laboratory can perform the overall analytical approach in a matrix free of interferences (e.g., in reagent water, clean sand, or another suitable reference matrix).

All analyte recoveries from the LCS/LCSD met the recovery criteria specified in the Basewide UFP-QAPP, except as noted in Section 4.0.

3.7 Surrogate Spike Recoveries

Surrogates are specified for organic chromatographic analytical procedures. Surrogates are compounds chemically similar to those tested and are specified for methods employed for this project. Surrogate recoveries are used to evaluate accuracy, method performance, and extraction efficiency.

Surrogate recoveries met the criteria specified in the Basewide UFP-QAPP, except as noted in Section 4.0.

3.8 Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike and duplicate spike (MS/MSD) samples are prepared (if applicable) and analyzed concurrently with a batch of 20 or fewer samples for each analytical procedure performed for

this project. Analyte recoveries from the field sample matrices may be used to assess the presence and effect of physical and chemical interferences associated with the sample matrices.

All MS/MSD recoveries met the recovery criteria specified in the Basewide UFP-QAPP, except as noted in Section 4.0.

3.9 Initial and Continuing Calibration Summary Information

Initial calibration verification (ICV) and continuing calibration verification check (CCV/CCC) standards are analyzed to monitor instrument performance prior to, during, and/or at the conclusion of sample analysis sequences. Frequency and acceptable ranges for each analysis performed for this project are outlined in the Basewide UFP-QAPP, the analytical methods, or the laboratory SOPs.

All ICV and CCV/CCC recoveries met control criteria specified, except as noted in Section 4.0.

3.10 Internal Standards Performance

Internal standards (IS) analyses are specified for analytical procedures where mass detection is employed (e.g., GC-MS). Internal standards recoveries were monitored as a diagnostic measure, since analyte quantitation was based on the initial calibration response.

All IS recoveries met the criteria specified in the Basewide UFP-QAPP, except as noted in Section 4.0.

3.11 Precision

Precision refers to the reproducibility of measurements. Precision is usually expressed as standard deviation, variance, percent difference, or range, in either absolute or relative terms. Precision data are used to evaluate consistency and reproducibility of field sampling and/or analytical procedures. Precision was evaluated by comparing the following:

- Laboratory control sample (LCS) and LCS duplicates (LCSD) (if prepared and analyzed) to determine the precision of the laboratory procedures and verify matrix interference
- Matrix spike (MS) and MS duplicate (MSD) samples to determine the effect of the sample matrix on the precision of the results generated using the selected analytical method
- Primary and field duplicate sample results

Field duplicates are generally collected at a frequency of 10 percent (one per 10 or fewer primary samples, per analyte, per matrix). Evaluation of field duplicate results is performed by calculation of the RPD between the parent sample and its field duplicate for every analyte of interest and matrix. In general, acceptance criteria are RPD less than 50% for soils and 30% for waters.

Precision measurements met the criteria specified in the Basewide UFP-QAPP, except as noted in Section 4.0.

4.0 ANALYTICAL METHODS

The following sections describe the results of the review and assessment of data for each analytical method. Samples were collected for analysis by methods SW8260B, SW8270C SIM/SW8270D SIM, SW8270D, and SW6020A. Measurement performance criteria for each analytical method are included in Worksheet #12 of the Basewide UFP-QAPP. Quality control exceedances identified during the review may require results to be qualified. Qualified results are considered estimated, and, whenever possible, potential direction of bias is indicated.

4.1 Volatile Organic Compounds (VOC) – EPA Method SW8260B

For SDG **1143022**: The following samples required dilutions: 14ST037Q2-OU5SP01-SP-0 (VOA 10x, PAH 10x), 14ST037Q2-OU5SP02-SP-0 (VOA 10x, PAH 10x).

The VOA MS and MSD were performed on sample 14ST037Q2-BPSW01-SW-0 and all QC criteria were met with the following exception: chloromethane (133/128%). Since chloromethane was not detected above the LOQ in parent sample 11439022012, no action was necessary.

Sample 14ST037Q2-TB02-SW-0 is the trip blank and all QC criteria were met.

Samples 14ST037Q2-WCSW02-SP-0/14ST037Q2-WCSW02-SP-1 and 14ST037Q2-BPSW01-SW-0/14ST037Q2-BPSW01-SW-1 are field duplicate pairs. All calculated %RPDs were less than the 30% criteria for waters.

No data qualification was required for the VOA analyses for this project.

For SDG **1143023**: The LCS/LCSD RPD for chloromethane (25) exceeded the QC limits. Since associated sample results for chloromethane were below LOQ, no qualifications were necessary. The VOA MS and MSD were performed on sample 1143023013 and all recoveries and RPDs were within QC limits with the following exceptions: chloromethane (RPD 23), 1,1-dichloroethane (RPD 29), and methyl-t-butyl ether (RPD 29). Since these compounds were detected in parent sample 1143023013, no action was necessary.

Sample 14ST037-TB01-GW-0 is the trip blank and all QC criteria were met.

Samples 14ST037-OU5MW12-GW-0/14ST037-OU5MW12-GW-1 and 14ST037-OUMW31-GW-0/14ST037-OUMW31-GW-1 are field duplicate pairs. All calculated %RPDs were below the 30% criteria for water samples.

No data qualification was required for the VOA analyses for this project.

For SDG **1144325**: Sample Receipt Form noted that container for sample 1144325006 was labeled 14ST037-OU5MW403WL01-GW-0 but CoC did not have "OU5MW". Sample was logged in per CoC.

The VOA MS and MSD were performed on sample 1144325001 and all recoveries and RPDs were within QC limits.

Sample 14LTM-TB03-GW-0 is the trip blank and all QC criteria were met.

Samples 14ST037-OU5MW38-GW-0 and 14ST037-OU5MW38-GW-1 are field duplicates. All %RPDs were within less than 30% criteria for water samples.

No data qualification was required for the VOA analyses for this project.

For SDG **1144413**: The following samples required dilutions: 14ST037-OU5SP02-SP-0 and 14ST037-OU5SP01-SP-0 (1,2,4-trimethylbenzene 5x, naphthalene 10x, 1-methylnapthalene 10x, 2-methylnaphthalene 10x in both samples).

The VOA MS and MSD were performed on samples 1144413005 and 1144413026 and all recoveries and RPDs were within QC limits with the following exception: RPD for chloroethane (27) was outside QC limits in sample1144413026. Since chloroethane was not detected in the parent sample, no qualifications were necessary.

The VOA LCS/LCSD 123449 (associated samples 1144413004, 015, 017-026, 029-034) had the RPD for acetone (22) outside QC limits. Since acetone was not detected in the associated samples, no qualifications were necessary.

Sample 14LTM-TB04-GW-0 is the trip blank and all QC criteria were met with the following exception: acetone (3.34 µg/L). The positive acetone result in associated sample 1144413008 was qualified by the validator with a "B" since sample concentration was less than 10 times the trip blank level.

Samples 14ST037-OU5MW8-GW-0/-1, 14ST037-WCSW02-SW-0/-1 and 14ST037-BPSW01-SW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters with the following exceptions: 1,1,2,2-tetrachloroethane (124%), chloroform (66%) and trichloroethene (42%) in samples 14ST037-OU5MW8-GW-0/-1 and cis-1,2-dichloroethene (107%) in samples 14ST037-WCSW02-SW-0/-1. The positive results for 1,1,2,2-tetrachloroethane, chloroform and trichloroethene were estimated in samples 14ST037-OU5MW8-GW-0/-1. The positive results for cis-1,2-dichloroethene were estimated in samples 14ST037-WCSW02-SW-0/-1. Direction of bias uncertain; however, since the higher of the two results were used in making field decisions, impact to data quality is minimal.

No other data qualification was required for the VOA analyses for this project.

For SDG **1144476**: The following samples required dilutions: 14ST041-ST4110R-GW-0 (VOA 5X/10X), 14ST041-ST4128-GW-0 (VOA 100X), 14ST041-ST4128-GW-1 (VOA 100X),

14LF04-LF04SP02-GW-0 (VOA 5X, SVOA 10X), 14LF059-LF05909SEEPSE-GW-0 (METALS 5X), 14SD015-OU6MW17-GW-0 (VOA 5X), 14LF059-LF05909SEEPSE-GW-0 (METALS 5X), 14LF059-LF05909SEEPSE-GW-1 (METALS 5X), 14LF059-LF05909SEEPSE-GW-1 (METALS 5X), 14LF04-LF04SP02-GGW-1 (SVOA 10X).

The VOA LCS/D RPD 1234499 for n-butylbenzene (23) was above QC limits of less than 20. The positive n-butylbenzene results were estimated (J) in associated samples 1144476001-003, 006-014; direction of bias uncertain.

The VOA MS and MSD were performed on samples 1144476003 and all recoveries and RPDs were within QC limits.

Sample 14LTM-TB06-GW-0 is the trip blank and all QC criteria were met with the following exception: acetone (6.26 µg/l) and chloromethane (0.780 µg/l). The positive acetone result in associated sample 11444476010 and positive chloromethane result in 014 were qualified by the validator with a "B" since acetone sample concentration was less than 10 times and chloromethane less than five times the trip blank level.

Samples 14ST041-ST4128-GW-0 and 14ST041-ST4128-GW-1 (VOA) are field duplicates. All calculated RPDs were less than the 30% criteria for waters for the duplicates with the following exceptions: isopropylbenzene (159%), n-propylbenzene (190%), 1,2,4-trimethylbenzene (54%) and 1,3,5-trimethylbenzene (56%) in duplicate pair 14ST041-ST4128-GW-0/14ST041-ST4128-GW-1. The positive results for isopropylbenzene , n-propylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene were estimated (J) in volatile samples14ST041-ST4128-GW-0 and14ST041-ST4128-GW-1. Direction of bias uncertain; however, since the higher of the two results were used in making field decisions, impact to data quality is minimal.

No other data qualification was required for the VOA analyses for this project.

For SDG **1144643**: The following samples required a 10 fold dilution for volatiles: 14FT023-OU4W11-GW-0 and 14FT023-OU4W11-GW-1.

The VOA MS and MSD were performed on samples 1144643003 and all recoveries and RPDs were within QC limits with the following exceptions: chloroethane (142%/-), 1,3,5-trimethylbenzene (64/65%) and 2-chlorotoluene (176/171%). Since chloroethane and 2-chlorotoluene were not detected in the parent sample 14FT023-OU4W11-GW-0, no qualifications were necessary. The positive result for 1,3,5-trimethylbenzene was estimated (J) in parent sample 14FT023-OU4W11-GW-0 due to potential low bias.

The VOA LCS/LCSD 1236137/1236138 (associcated samples all samples) recoveries and RPD outside QC limits for chloroethane (-/141%, RPD 29). Since chloroethane was not detected in the associated samples, no qualifications were necessary.

Sample 14LTM-TB11-GW-0 is the trip blank and all QC criteria were met.

Samples 14FT023-OU4W11-GW-0/ and 14FT023-OU4W11-GW-1 are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

It was noted in the case narrative that CCV 1236828 had chloromethane recovery above QC limits. Since chloromethane was not reported from this analysis run but from CCV1236140 (and all QC criteria were met), no action was taken.

No other data qualification was required for the VOA analyses for this project.

For SDG **1144644**: Although most samples were aqueous, samples 1144644023 and 1144644026 were soil samples with % solids less than 70% but above 30%. No qualifications were made.

The following samples required a dilution for volatiles: 14SD025-OU4MW8R-GW-0 (1/20/200X), 14ST041-ST4125-GW-0 (1/20/50X), ST041-ST4116-GW-0 (1/20/200X), 14DP098-41`755WL05-GW-0 (1/5/100X), 14DP098-41755WL05-GW-1 (1/10/100X), 14DP098-41755WL04-GW-0 (1/20X), 14DP098-41755WL03-GW-0 (1/20X), 14DP098-41755WL02-GW-0 (1/100X), 14DP098-DP98INJ02-GW-0 (1/20/100/10000X), DP098-41755WL08-GW-0 (1/10X).

The VOA soil MS and MSD were performed on samples 1236131 (not a project sample, therefore no evaluation performed) and 1144644023. The VOA aqueous MS and MSD were performed on sample 114464003. All recoveries and RPDs were within QC limits.

The VOA LCS/LCSD 1236586/1236587 and 1236825/1236826 (associated samples 1144644001, 002, 003. 006-010, 011-022) had RPD outside limits for chloroethane (RPD 22 and 32 respectively). LCS/LCSD 1236825/1236826 also had %recovery of chloromethane (-/135%) above QC limits. Since chloroethane and chloromethane were not detected in the associated samples, no qualifications were necessary.

Sample 14LTM-TB07-GW-0 is the trip blank and all QC criteria were met.

Samples 14LF059-LF59MW02-GW-0/14LF059-LF59MW02-GW-1, 14DP098-41755WL05-GW-0/14DP098-41755WL05-GW-1 and 14ST037-WCSD09-SE-0/14ST037-WCSD09-SE-1 (soil) are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters and less than 50% for soils with the following exception: cis-1,2-dichloroethene (76%) in samples 14DP098-41755WL05-GW-0/14DP098-41755WL05-GW-1. The positive results for cis-1,2-dichloroethene in aqueous samples14DP098-41755WL05-GW-0/14DP098-41755WL05-GW-1 were estimated (J) due to %RPD greater than <30% criteria for waters. Since the higher of the two results were used in making field decisions, impact to data is minimal.

Sample JBER-LTMEQUIP-EB-0 was the equipment blank and all QC criteria were met.

Soil CCV1236135 (associated samples 1144644023, 026 and 027) had %R for acetone (75%) below QC limits of 80-120% and chloroethane (127%) above QC limits. The non-detected results for acetone were estimated (UJ) in samples 1144644023, 026 and 027 due to potential

low bias. No action was necessary for chloroethane since it was not detected in the associated samples.

Aqueous CCV1236828 (associated samples 1144644007-009, 011-015, 017) had %R for chloromethane (121%) above QC limits. Since chloromethane was not detected in the associated samples, no qualifications were necessary.

No other data qualification was required for the VOA analyses for this project.

For SDG **1145515**: The following samples required dilutions: 14WP014-OU6MW92-GW-0 (VOA 2/10X).

The VOA MS and MSD were performed on samples 14WP014-OUMW67-GW-0 (1145515002) and all recoveries and RPDs were within QC limits with the following exception: RPD for bromomethane (20) and chloromethane (36) were outside QC limits. Since bromomethane was not detected in the parent sample and chloromethane was below LOQ and already (J), no qualifications were necessary. The recoveries for 1,1,2-trichloroethane (182/179%) and 4-Isopropyltoluene (144/149%) were above QC limits. Since 1,1,2-trichloroethane was not detected in the parent sample, no action was necessary. The positive result for 4-Isopropyltoluene was estimated (J) in parent sample 14WP014-OUMW67-GW-0 (1145515002) due to potential high bias.

Sample 14WP014-TB01-GW-0 is the trip blank and all QC criteria were met with the following exception: acetone (3.63 µg/L). The positive acetone result in associated sample 14WP014-OU6MW93-GW-01-1 was qualified by the validator with a "B" since sample concentration was less than 10 times the trip blank level.

Samples 14WP014-OU6MW93-GW-0 and 14WP014-OU6MW93-GW-1 are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

For SDG **1145639**: The VOA MS and MSD were performed on sample 14ST037-SP2605-GW-0 and all recoveries and RPDs were within QC limits.

Sample 14ST037-TB02-GW-0 is the trip blank and all QC criteria were met. Samples 14ST037-OU5MW45-GW-0/-1 and 14ST037-OU5MW13-GW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters.

For SDG **1146094**: The following samples required dilutions: 14ST037-Q4-OU5SP02-SP-0 (VOA 1/10X), PAH (1/10X) and 14ST037-Q4-OU5SP01-SP-0(VOA 1/10X), PAH (1/10X).

The VOA MS and MSD were performed on sample 14ST037-Q4-BPSW01-SW-0 (1146094006) and all recoveries and RPDs were within QC limits.

Sample 14ST037-Q4-TB01-SW-0 is the trip blank and all QC criteria were met.

Samples 14ST037-Q4-OU5CP01-SP-0/-1 and 14ST037-Q4-BPSW01-SW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters.

No data qualification was required for the VOA analyses for this project.

For SDG **1146095**: A VOA MS and MSD were not performed for Prep Batch VXX 26896, therefore, matrix affect could not be determined. However, an LCS and LCSD were performed and all QC criteria were met. Impact to data usability is minimal.

Sample 14LF04-Q4-TB01-SP-0 is the trip blank and all QC criteria were met. A field duplicate was not submitted with this SDG.

1250245 CCV (associated samples –ALL) recovery for cis-1,3-dichloropropane (123%) recovered above QC limits of 80-120%. The non-detected results for cis-1,3-dichloropropane were estimated (UJ) in all samples, direction of bias uncertain.

No other data qualification was required for the VOA analyses for this project.

For SDG **320-6549-1**: Volatile sample 14ST037Q1-WCSW02-SW-0 (RA2) and 14ST037Q1-BPSW01-SW-0 (RA2) were analyzed outside of holding time. The laboratory flagged these results with "H". Since these results were not used, no qualifications were necessary.

The following sample was analyzed at a dilution: 14ST037Q1-OU5SP01-SW-0 (VOA 5X).

In VOA Batch 38709 MB 320-38709/15 (associated samples -4, -10 through -15) trichloroethene (0.201 ug/l) was detected. The laboratory did not flag associated sample results. The positive result for trichloroethene was flagged by the validator with a "B" in sample -10 (14ST037Q1-BPSW01-SW-1) since result is below 5 times the method blank level. No action was necessary for sample -4 since it was reanalyzed in Batch 38807 or -11 and -12 since above 5 times, or -14 and -15 since not detected. No flag was required for the positive result (1.8) in sample -13 because the concentration in the sample is more than five times the method blank level.

The VOA Batch 38709 MS and MSD were performed on sample 14ST037Q1-WCSW02-SW-0 (320-6549-4) and several compounds had recoveries and RPDs outside QC limits. The samples including the MS and MSD were reanalyzed on 3/21/14 in Batch 38807 with a clean MB320-38807/19 and all QC criteria being met except for the acetone RPD of 52. The non-detected acetone result in sample 14ST037Q1-WCSW02-SW-0 (320-6549-4)-RA was estimated (UJ) by the laboratory and the validator agree; direction of bias uncertain.

14ST037Q1-TB01-SW-0 is the trip blank and all QC criteria were met. Samples 14ST037Q1-BPSW01-SW-0 and 14ST037Q1-BPSW01-SW-1 are field duplicates. All %RPDs were within less than 30% criteria for water samples.

No other data qualification was required for the VOA analyses for this project.

For SDG **320-9506-1**: It was noted in the case narrative that the container label for the following sample did not match the COC: the COC lists one vial for 8260 preserved with methanol for all three samples. The lab received two containers preserved with NAHSO4 for the trip blank and 14WTC-WCDS09-SO-1 and the lab received 6 containers with NAHSO4 for sample 14WTC-WCSD09-SO-0.

MB320-53312/12 contained naphthalene (0.852 µg/kg). Since the associated samples 320-9506-2RA and -3RA were not reported, no qualifications were made.

The VOA MS and MSD were performed on sample14ST037-WCSD09-SE-0 and several recoveries and RPDs were outside QC limits. Since all results in the parent sample were already estimated due to low surrogate and internal standard recoveries, no further action was needed. The laboratory did flag these affected compounds with a "J" in the parent sample and the validator agreed. The laboratory flagged parent sample results with a "Q" to indicate internal standard failure. The validator replaced the Q with a "J" since all positive and non-detected results are considered estimated due to low bias.

Surrogate 4-bromofluorobenzene recovered below QC limits in samples 14ST037-WCSD09-SE-0 (76%) and 14ST037-WCSD09-SE-1 (84%) and -3RA (82%). The laboratory flagged the surrogate failed recovery with a "Q" but not the sample results. The validator estimated all results (J/UJ) in samples 14ST037-WCSD09-SE-0 and 14ST037-WCSD09-SE-1 due to potential low bias.

Sample 14LTM-TB09-SO-0 is the trip blank and all QC criteria were met. Samples 14ST037-WCSD09-SE-0 and 14ST037-WCSD09-SE-1 are field duplicates and all %RPDs were less than the 50% criteria for soils.

No other data qualification was required for the VOA analyses for this project.

4.2 Polycyclic Aromatic Hydrocarbons (PAH) – EPA Method SW8270C SIM

For **SDG 1143022**: The following samples required dilutions: 14ST037Q2-OU5SP01-SP-0 (VOA 10x, PAH 10x), 14ST037Q2-OU5SP02-SP-0 (VOA 10x, PAH 10x).

The PAH MS and MSD were performed on sample 14ST037Q2-BPSW01-SW-0 and all QC criteria were met.

Samples 14ST037Q2-WCSW02-SP-0/14ST037Q2-WCSW02-SP-1 and 14ST037Q2-BPSW01-SW-0/14ST037Q2-BPSW01-SW-1 are field duplicate pairs. All calculated %RPDs were less than the 30% criteria for waters.

No data qualification was required for the PAH analyses for this project.

For SDG **1143023**: Not analyzed for this project.

For SDG **1144325**: Not analyzed for this project.

For SDG **1144413**: The following samples required dilutions: 14ST037-OU5SP02-SP-0 and 14ST037-OU5SP01-SP-0 (1,2,4-trimethylbenzene 5x, naphthalene 10x, 1-methylnapthalene 10x, 2-methyl naphthalene 10x in both samples).

The PAH MS and MSD were performed on samples 1144413026 and 1144413019 and all QC criteria were met.

PAH surrogate 2-fluorobiphenyl (49.7%) recovered slightly below the QC limits of 50-110 in sample 14ST037-BPSW03-SW-0. The positive and non-detected results were estimated (J/UJ) in this sample due to potential low bias.

Samples 14ST037-OU5MW8-GW-0/-1, 14ST037-WCSW02-SW-0/-1 and 14ST037-BPSW01-SW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters.

No other data qualification was required for the SVOA analyses for this project.

For **SDG 1144476**: The PAH MS and MSD were performed on samples 1144476009 and all QC criteria were met with the following exceptions: 1-methylnapthalene (6/6%), 2-methylnapthalene (38/20%) and naphthalene (-43/-42%). These three compounds were also out of QC limits in the CCV 1234956 (1-methylnapthalene 133%, 2-methylnapthalene 130%, and naphthalene 136%-associated samples 144476009 and 020). The positive results for 1-methylnapthalene, 2-methylnapthalene and naphthalene were estimated (J) in samples 144476009 and 020 due to potential high bias.

The PAH LCS 1233533 (associated samples 1144476012 & 019) recovered above QC limits of 55-110 for Chrysene (114%). Since chrysene was not detected in the associated samples, no qualifications were necessary.

Samples 14LF04-LF04SP02-GW-0 and 14LF04-LF04SP02-GW-1 (PAH) are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

No other data qualification was required for the SVOA analyses for this project.

For SDG **1144643**: Not analyzed for this project.

For SDG **1144644**: Not analyzed for this project.

For SDG **1145515**: Not analyzed for this project.

For SDG **1145639**: Not analyzed for this project.

For **SDG 1146094**: The PAH MS and MSD were performed on sample 14ST037-Q4-BPSW01-SW-0 (1146094006) and all recoveries and RPDs were within QC limits.

PAH surrogate terpheny-d14 (174%) recovered slightly below the QC limits of 50-135 in sample 14ST037-Q4-WCSW04-SW-0. Since results were less than LOQ and already estimated (J) or non-detect, no action was necessary.

Samples 14ST037-Q4-OU5CP01-SP-0/-1 and 14ST037-Q4-BPSW01-SW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters.

No data qualification was required for the SVOA analyses for this project.

For **SDG 1146095**: Not analyzed for this project.

For **SDG 320-6549-1**: The following sample was analyzed at a dilution: 14ST037Q1-OU5SP01-SW-0 (PAH 20x).

Surrogate nitrobenzene-d5 recovered below QC limits (0%) in sample 14ST037-Q1-OU5SP01-SW-0 (320-6549-8). All positive results and non-detected results (except for 1-methylnapthlene, 2-methylnapthalene and naphthalene results reported from –DL analysis) were estimated (J,UJ) due to potential low bias. Nitrobenzene-d5 had 0% recovery in –DL analysis also due to 20 fold dilution, however, no qualifications were made for samples diluted 20 fold or greater.

Samples 14ST037Q1-BPSW01-SW-0 and 14ST037Q1-BPSW01-SW-1 are field duplicates. All %RPDs were within less than 30% criteria for water samples.

No data qualification was required for the PAH analyses for this project.

For SDG **320-9506-1:** Not analyzed for this project.

4.3 Semivolatile Organic Compounds (SVOC) – EPA Method SW8270D

For SDG **1143022**: Not analyzed for this project.

For SDG **1143023**: Not analyzed for this project.

For SDG **1144325**: Not analyzed for this project.

For SDG **1144413**: Not analyzed for this project.

For SDG **1144476**: The MS and MSD were performed on sample 14LF059-LF05909SEEPSE-GW-0 (1144476012) and all QC criteria were met.

Samples 14LF059-LF05909SEEPSE-GW-0 and 14LF059-LF05909SEEPSE-GW-1 (1144476012/1144476019) are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

No other data qualification was required for the SVOA analyses for this project.

For SDG **1144643**: Not analyzed for this project.

For SDG **1144644**: Not analyzed for this project.

For SDG **1145515**: Not analyzed for this project.

For SDG **1145639**: Not analyzed for this project.

For SDG **320-6549-1**: Not analyzed for this project.

For SDG **320-9506-1:** Not analyzed for this project.

4.4 Total Metals – EPA Method SW6020/SW6020A

For SDG **1143022**: Not analyzed for this project.

For SDG **1143023**: Not analyzed for this project.

For SDG **1144325**: Not analyzed for this project.

For SDG **1144413**: Not analyzed for this project.

For SDG **1144476**: The metals MS and MSD were performed on sample 1144476012 (associated samples 1144476012 and 019) and all QC criteria were met. The metals MS and MSD were also performed on sample 1144476015 (associated samples 1144476015 and 018) and had manganese recovery (72/-%) below QC limits in the MS. The positive Manganese results were estimated (J) in samples 1144476015 and 018 due to potential low bias.

Samples 14LF059-LF05909SEEPSE-GW-0 and 14LF059-LF05909SEEPSE-GW-1 (1144476012/019 total metals and 015/018 dissolved metals) are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

No other data qualification was required for the metals analyses for this project.

For SDG **1144643**: Not analyzed for this project.

For SDG **1144644**: Not analyzed for this project.

For SDG **1145515**: Not analyzed for this project.

For SDG **1145639**: Not analyzed for this project.

For SDG **1146094**: Not analyzed for this project.

For SDG **1146095**: Not analyzed for this project.

For SDG **320-6549-1**: Not analyzed for this project.

For SDG **320-9506-1:** Not analyzed for this project.

Table C-5 Analytical Results Qualified due to Matrix Spike Recoveries Exceeding QC Limits (continued)

5.0 COMPLETENESS

Completeness is a measure of the amount of valid data obtained compared with the amount that was expected to be obtained under correct, normal conditions. For completeness requirements, valid results are all results not qualified with an R-flag after a usability assessment has been performed. Completeness should not be determined only on the basis of laboratory data qualifiers.

Completeness is calculated and reported for each method, matrix, and analyte combination using the formula below:

$$\%\ Completeness = 100\ x\ (\frac{V}{n})$$

Where: V = number of measurements judged valid
n = total number of measurements

The goal for completeness is 95 percent for aqueous samples and 90 percent for sediment samples. 89 samples were collected and no samples were rejected. 89/89*100=100%. All completeness goals were met for the project.

6.0 OVERALL DATA ASSESSMENT

In general, the overall quality of the project data was acceptable. No data were rejected. All data are considered acceptable for use, with the limitations discussed within this QA/QC report and the ADEC Laboratory Data Review Checklists regarding the qualifiers applied to the results.

7.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2002. *Underground Storage Tanks Procedures Manual*. November.

Department of Defense (DoD), 2010. *Quality Systems Manual for Environmental Laboratories*. October.

U.S. Environmental Protection Agency (EPA), 2007. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. EPA Publication *SW-846* (3rd edition through Final Update IV). February.

U.S. Air Force (USAF), 2014a. *Remedial Action-Operations and Monitoring Letter Work Plan Addendum.* Joint Base Elmendorf-Richardson, Alaska. August.

Table C-5 Analytical Results Qualified due to Matrix Spike Recoveries Exceeding QC Limits (continued)

USAF, 2014b. *Basewide Uniform Federal Policy-Quality Assurance Project Plan.* Joint Base Elmendorf-Richardson, Alaska. August.

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: May 22, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: April 3, 2014

Consultant Firm: Weston Solutions, Inc.

Laboratory Name: TestAmerica West Sacramento Laboratory Report Number: 320-6549-1

ADEC File Number: ADEC RecKey Number:

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

      All samples were analyzed by TestAmerica West Sacramento.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      xYes No NA (Please explain.) Comments:

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

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

      Samples were received within accepted range of 4° ± 2° C.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

xYes No NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
xYes No NA (Please explain.) Comments:

All samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
xYes No NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect.

4. Case Narrative
a. Present and understandable?
xYes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
x Yes No NA (Please explain.) Comments:

c. Were all corrective actions documented?
xYes No NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

There was no effect on data quality or usability.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
xYes No NA (Please explain.) Comments:

b. All applicable holding times met?

Volatile sample 14ST037Q1-WCSW02-SW-0 (RA2) and 14ST037Q1-BPSW01-SW-0 (RA2) were analyzed outside of holding time. The laboratory flagged these results with "H". Since these results were not used, no qualifications were necessary.

Yes x No NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?
Yes No x NA (Please explain.) Comments:

Dry weight is not applicable for aqueous samples.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
xYes No NA (Please explain.) Comments:

However, the following sample was analyzed at a dilution: 14ST037Q1-OU5SP01-SW-0 (VOA 5X, PAH 20x).

e. Data quality or usability affected?
Comments:

Impact on data is minimal.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      xYes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
      Yes xNo NA (Please explain.) Comments:

In VOA Batch 38709 MB 320-38709/15 (associated samples -4, -10 through -15) trichloroethene (0.201 ug/l) was detected. The laboratory did not flag associated sample results. The positive result for trichloroethene was flagged by the validator with a "B" in sample -10 (14ST037Q1-BPSW01-SW-1) since result is below 5 times the method blank level. No action was necessary for sample -4 since it was reanalyzed in Batch 38807 or -11 and -12 since above 5 and 10 times, or -14 and -15 since not detected. No flag was required for the positive result (1.8) in sample -13 because the sample concentration was more than five times the method blank level.

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

See discussion in ii above.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      x Yes No NA (Please explain.) Comments:

See explanation in ii and iii above.

      v. Data quality or usability affected? (Please explain.)

No affect except as noted above.

Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)/Matrix Spike (MS)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

xYes No NA (Please explain.) Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes No xNA (Please explain.) Comments:

Metals not performed.

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 x No NA (Please explain.) Comments:

The VOA Batch 38709 MS and MSD were performed on sample 14ST037Q1-WCSW02-SW-0 (320-6549-4) and several compounds had recoveries and RPDs outside QC limits. The samples including the MS and MSD were reanalyzed on 3/21/14 in Batch 38807 with a clean MB320-38807/19 and all QC criteria being met except for the acetone RPD of 52. The non-detected acetone result in sample 14ST037Q1-WCSW02-SW-0 (320-6549-4)-RA was estimated (UJ) by the laboratory and the validator agree; direction of bias uncertain.

iv. Precision – All relative percent differences (RPD) 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 x No NA (Please explain.) Comments:

See discussion above iii.

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

Comments:

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

xYes No NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Minimal effect as noted above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
xYes No NA (Please explain.) Comments:

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 xNo NA (Please explain.) Comments:

Surrogate nitrobenzene-d5 recovered below QC limits (0%) in sample14ST037-Q1-OU5SP01-SW-0 (320-6549-8). All positive results and non-detected results (except for 1-methylnapthlene, 2-methylnapthalene and naphthalene results reported from –DL analysis) were estimated (J,UJ) due to potential low bias. Nitrobenzene-d5 had 0% recovery in –DL analysis also due to 20 fold dilution, however, no qualifications were made for samples diluted 20 fold or greater.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
xYes No NA (Please explain.) Comments:

Failed surrogate recoveries were flagged "Q" by the laboratory, however, actual sample results were not flagged.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect except as mentioned above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
x Yes No NA (Please explain.) Comments:

14ST037Q1-TB01-SW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
x Yes No NA (Please explain.) Comments:

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

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

xYes No NA (Please explain.) Comments:

Samples 14ST037Q1-BPSW01-SW-0 and 14ST037Q1-BPSW01-SW-1 are field duplicates.

ii. Submitted blind to lab?

x Yes No NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

x Yes No NA (Please explain.) Comments:

All %RPDs were within less than 30% criteria for water samples.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

Yes x No NA (Please explain.) Comments:

No equipment blanks were collected due to disposable equipment.

i. All results less than PQL?

Yes No xNA (Please explain.) Comments:

An equipment blank was not analyzed.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

Not applicable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      x Yes No NA (Please explain.) Comments:

The laboratory qualified results with a "J" to indicate result is estimated due to result above the DL but below the LOQ.

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: November 6, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: October 8, 2014

Consultant Firm: Weston Solutions

Laboratory Name: TestAmerica, West Sacramento, CA Laboratory Report Number: 320-9506-1

ADEC File Number: 2101.38.005.01 RecKey Number: ADEC

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

      TestAmerica, West Sacramento, CA

   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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

It was noted in the case narrative that the container label for the following sample did not match the COC: the COC lists one vial for 8260 preserved with methanol for all three samples. The lab received two containers preserved with NAHSO4 for the trip blank and 14WTC-WCDS09-SO-1 and the lab received 6 containers with NAHSO4 for sample 14WTC-WCSD09-SO-0.

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

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:

e. Data quality or usability affected?
Comments:

No affect.

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:

MB320-53312/12 contained naphthalene (0.852 ug/kg). Since the associated samples 320-9506-2RA and -3RA were not reported, no qualifications were made.

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

Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

No affect.

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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on sample14ST037-WCSD09-SE-0 and several recoveries and RPDs were outside QC limits. Since all results in the parent sample were already estimated due to low surrogate and internal standard recoveries, no further action was needed. The laboratory did flag these affected compounds with a "J" in the parent sample and the validator agreed.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
xYes No NA (Please explain.) Comments:

The laboratory flagged parent sample results with a "Q" to indicate internal standard failure. The validator replaced the Q with a "J" since all positive and non-detected results are considered estimated due to low bias.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect except as noted above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

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:

Surrogate 4-bromofluorobenzene recovered below QC limits in samples 14ST037-WCSD09-SE-0 (76%) and 14ST037-WCSD09-SE-1 (84%) and -3RA (82%). The laboratory flagged the surrogate failed recovery with a "Q" but not the sample results. The validator estimated all results (J/UJ) in samples 14ST037-WCSD09-SE-0 and 14ST037-WCSD09-SE-1 due to potential low bias.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect except as noted above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒ Yes ☐ No ☐NA (Please explain.) Comments:

Sample 14LTM-TB09-SO-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒ Yes ☐ No ☐NA (Please explain.) Comments:

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

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect except as noted above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037-WCSD09-SE-0 and 14ST037-WCSD09-SE-1 are field duplicates and all %RPDs were less than the 50% criteria for soils.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

See discussion above i.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: September 15, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: July 29, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1143022

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

The following samples required dilutions: 14ST037Q2-OU5SP01-SP-0 (VOA 10x, PAH 10x), 14ST037Q2-OU5SP02-SP-0 (VOA 10x, PAH 10x).

e. Data quality or usability affected?
Comments:

No affect.

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?
Comments:

Not applicable.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

No affect.

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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on sample 11439022012 and all recoveries were within QC limits with the following exceptions: chloromethane (133/128%). Since chloromethane was not detected above the LOQ in parent sample 11439022012, no action was necessary.

iv. Precision – All relative percent differences (RPD) 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:

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

Comments:

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?
☐ Yes ☐ No ☒NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒ Yes ☐ No ☐NA (Please explain.) Comments:

Sample 14ST037Q2-TB02-SW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒ Yes ☐ No ☐NA (Please explain.) Comments:

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

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

Not applicable.

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

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037Q2-WCSW02-SP-0/14ST037Q2-WCSW02-SP-1 and 14ST037Q2-BPSW01-SW-0/14ST037Q2-BPSW01-SW-1 are field duplicate pairs.

ii. Submitted blind to lab?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

All calculated %RPDs were less than the 30% criteria for waters.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

No affect.

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

VOA CCV 1220429 had a high recovery for chloromethane (125%). Since associated sample results did not have chloromethane results above the LOQ, no action was necessary.

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: September 16, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: July 30, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1143023

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

e. Data quality or usability affected?
Comments:

No affect.

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?
      Comments:

      Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

      No affect.

   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:

No metals analysis was performed.

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:

The LCS/LCSD RPD for chloromethane (25) exceeded the QC limits. Since associated sample results for chloromethane were below LOQ, no qualifications were necessary. The VOA MS and MSD were performed on sample 1143023013 and all recoveries and RPDs were within QC limits with the following exceptions: chloromethane (RPD 23), 1,1-dichloroethane (RPD 29), and methyl-t-butyl ether (RPD 29). Since these compounds were detected in parent sample 1143023013, no action was necessary.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14ST037-TB01-GW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037-OU5MW12-GW-0/14ST037-OU5MW12-GW-1 and 14ST037-OUMW31-GW-0/14ST037-OUMW31-GW-1 are field duplicate pairs.

ii. Submitted blind to lab?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

All calculated %RPDs were less than the 30% criteria for waters.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

No affect.

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: September 30, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: September 16, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1144325

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

Sample Receipt Form noted that container for sample 1144325006 was labeled 14ST037-OU5MW403WL01-GW-0 but COC did not have "OU5MW". Sample was logged in per COC.

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

e. Data quality or usability affected?
Comments:

No affect.

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?
Comments:

Not applicable.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

No affect.

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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on sample 1144325001 and all recoveries and RPDs were within QC limits.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

Not applicable.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14LTM-TB03-GW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037-OU5MW38-GW-0 and 14ST037-OU5MW38-GW-1 are field duplicates.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

All calculated %RPDs were less than the 30% criteria for waters.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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

a. Defined and appropriate?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: October 7, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: September 25, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1144413

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

However, the following samples required dilutions: 14ST037-OU5SP02-SP-0 and 14ST037-OU5SP01-SP-0 (1,2,4-trimethylbenzene 5x, naphthalene 10x, 1-methylnapthalene 10x, 2-methyl naphthalene 10x in both samples).

e. Data quality or usability affected?
Comments:

No affect.

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?
      Comments:

      Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

      No affect.

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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on samples 1144413005 and 1144413026 and all recoveries and RPDs were within QC limits with the following exception: RPD for chloroethane (27) was outside QC limits in sample1144413026. Since chloroethane was not detected in the parent sample, no qualifications were necessary.
The PAH MS and MSD were performed on samples 1144413026 and 1144413019 and all QC criteria were met.
The VOA LCS/LCSD 123449 (assoc. samples 1144413004, 015, 017-026, 029-034) had the RPD for acetone (22) outside QC limits. Since acetone was not detected in the associated samples, no qualifications were necessary.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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:

PAH surrogate 2-fluorobiphenyl (49.7%) recovered slightly below the QC limits of 50-110 in sample 14ST037-BPSW03-SW-0. The positive and non-detected results were estimated (J/UJ) in this sample due to potential low bias.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect except as noted above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14LTM-TB04-GW-0 is the trip blank and all QC criteria were met with the following exception: acetone (3.34 ug/l). The positive acetone result in assoc. sample 1144413008 was qualified by the validator with a "B" since sample concentration was less than 10 times the trip blank level.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

See discussion above i.

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect except as noted above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037-OU5MW8-GW-0/-1, 14ST037-WCSW02-SW-0/-1 and 14ST037-BPSW01-SW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters with the following exceptions: 1,1,2,2-tetrachloroethane (124%), chloroform (66%) and trichloroethene (42%) in samples 14ST037-OU5MW8-GW-0/-1 and cis-1,2-dichloroethene (107%) in samples 14ST037-WCSW02-SW-0/-1. The positive results for 1,1,2,2-tetrachloroethane, chloroform and trichloroethene were estimated in samples 14ST037-OU5MW8-GW-0/-1. The positive results for cis-1,2-dichloroethene were estimated in samples 14ST037-WCSW02-SW-0/-1. Direction of bias uncertain; however, since the higher of the two results were used in making field decisions, impact to data quality is minimal.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

See discussion above i.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

See discussion above i.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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

a. Defined and appropriate?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: October 20, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: September 30, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1144476

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

The laboratory inadvertently included TCLP leaching blank pages which were not part of this SDG. The laboratory was contacted and the package was resubmitted.

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

However, the following samples required dilutions: 14ST041-ST4110R-GW-0 (VOA 5X/10X), 14ST041-ST4128-GW-0 (VOA 100X), 14ST041-ST4128-GW-1 (VOA 100X), 14LF04-LF04SP02-GW-0 (VOA 5X, SVOA 10X), 14LF059-LF05909SEEPSE-GW-0 (METALS 5X), 14SD015-OU6MW17-GW-0 (VOA 5X), 14LF059-LF05909SEEPSE-GW-0 (METALS 5X), 14LF059-LF05909SEEPSE-GW-1 (METALS 5X), 14LF059-LF05909SEEPSE-GW-1 (METALS 5X), 14LF04-LF04SP02-GGW-1 (SVOA 10X).

e. Data quality or usability affected?

Comments:

No affect.

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?

Comments:

Not applicable.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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:

The metals MS and MSD were performed on sample 1144476012 (assoc. samples 1144476012 and 019) and all QC criteria were met. The metals MS and MSD were also performed on sample 1144476015 (assoc. samples 1144476015 and 018) and had manganese recovery (72/-%) below QC limits in the MS. The positive Manganese results were estimated (J) in samples 1144476015 and 018 due to potential low bias.
The VOA LCS/D RPD 1234499 for n-butylbenzene (23) was above QC limits of less than 20. The positive n-butylbenzene results were estimated (J) in associated samples 1144476001-003, 006-014; direction of bias uncertain.
The VOA MS and MSD were performed on samples 1144476003 and all recoveries and RPDs were within QC limits.
The PAH LCS 1233533 (assoc. samples 1144476012 & 019) recovered above QC limits of 55-110 for Chrysene (114%). Since chrysene was not detected in the associated samples, no qualifications were necessary.
The PAH MS and MSD were performed on samples 1144476009 and all QC criteria were met with the following exceptions: 1-methylnapthalene (6/6%), 2-methylnapthalene (38/20%) and naphthalene (-43/-42%). These three compounds were also out of QC limits in the CCV 1234956 (1-methylnapthalene 133%, 2-methylnapthalene 130%, and naphthalene 136%-assoc. samples 144476009 and 020). The positive results for 1-methylnapthalene, 2-methylnapthalene and naphthalene were estimated (J) in samples 144476009 and 020 due to potential high bias.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

Comments:

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?
☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14LTM-TB06-GW-0 is the trip blank and all QC criteria were met with the following exception: acetone (6.26 ug/l) and chloromethane (0.780 ug/l). The positive acetone result in assoc. sample 11444476010 and positive chloromethane result in 014 were qualified by the validator with a "B" since acetone sample concentration was less than 10 times and chloromethane less than five times the trip blank level.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐NA (Please explain.) Comments:

iii. All results less than PQL?

☐ Yes ☒ No ☐NA (Please explain.) Comments:

See discussion above i.

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect except as noted above.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

Samples 14ST041-ST4128-GW-0/14ST041-ST4128-GW-1 (VOA); 14LF04-LF04SP02-GW-0/14LF04-LF04SP02-GW-1 (PAH) and 14LF059-LF05909SEEPSE-GW-0/ 14LF059-LF05909SEEPSE-GW-1 (1144476012/019 total metals and SVOA and 015/018 dissolved metals) are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters for the duplicates with the following exceptions: isopropylbenzene (159%), n-propylbenzene (190%), 1,2,4-trimethylbenzene (54%) and 1,3,5-trimethylbenzene (56%) in duplicate pair 14ST041-ST4128-GW-0/14ST041-ST4128-GW-1. The positive results for isopropylbenzene , n-propylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene were estimated (J) in volatile samples14ST041-ST4128-GW-0 and14ST041-ST4128-GW-1. Direction of bias uncertain; however, since the higher of the two results were used in making field decisions, impact to data quality is minimal.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐ Yes ☒ No ☐NA (Please explain.) Comments:

See discussion above i.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

See discussion above i.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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

a. Defined and appropriate?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: October 8, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: September 29, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1144643

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

However, the following samples required a 10 fold dilution for volatiles: 14FT023-OU4W11-GW-0 and 14FT023-OU4W11-GW-1.

e. Data quality or usability affected?
Comments:

No affect.

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?
      Comments:

      Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

      No affect.

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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on samples 1144643003 and all recoveries and RPDs were within QC limits with the following exceptions: chloroethane (142%/-), 1,3,5-trimethylbenzene (64/65%) and 2-chlorotoluene (176/171%). Since chloroethane and 2-chlorotoluene were not detected in the parent sample 14FT023-OU4W11-GW-0, no qualifications were necessary. The positive result for 1,3,5-trimethylbenzene was estimated (J) in parent sample 14FT023-OU4W11-GW-0 due to potential low bias.
The VOA LCS/LCSD 1236137/1236138 (assoc. samples all samples) recoveries and RPD outside QC limits for chloroethane (-/141%, RPD 29). Since chloroethane was not detected in the associated samples, no qualifications were necessary.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect except as noted above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14LTM-TB11-GW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

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

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14FT023-OU4W11-GW-0/ and 14FT023-OU4W11-GW-1 are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Not applicable.

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

It was noted in the case narrative that CCV 1236828 had chloromethane recovery above QC limits. Since chloromethane was not reported from this analysis run but from CCV1236140 (and all QC criteria were met), no action was taken.

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: October 9, 2014

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: September 29, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1144644

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

Although most samples were aqueous and this does not apply, samples 1144644023 and 1144644026 were soil samples with % solids less than 70% but above 30%. No qualifications were made.

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:

However, the following samples required a ilution for volatiles: 14SD025-OU4MW8R-GW-0 (1/20/200X), 14ST041-ST4125-GW-0 (1/20/50X), ST041-ST4116-GW-0 (1/20/200X), 14DP098-41`755WL05-GW-0 (1/5/100X), 14DP098-41755WL05-GW-1 (1/10/100X), 14DP098-41755WL04-GW-0 (1/20X), 14DP098-41755WL03-GW-0 (1/20X), 14DP098-41755WL02-GW-0 (1/100X), 14DP098-DP98INJ02-GW-0 (1/20/100/10000X), DP098-41755WL08-GW-0 (1/10X).

e. Data quality or usability affected?

Comments:

No affect.

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?

Comments:

Not applicable.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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:

No metals analysis was performed.

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:

The VOA soil MS and MSD were performed on samples 1236131 (not Weston sample, therefore no evaluation performed) and 1144644023. The aqueous MS and MSD were performed on sample 114464003. All recoveries and RPDs were within QC limits.
The VOA LCS/LCSD 1236586/1236587 and 1236825/1236826 (assoc. samples 1144644001, 002, 003. 006-010, 011-022) had RPD outside limits for chloroethane (RPD 22 and 32 respectively). LCS/LCSD 1236825/1236826 also had %recovery of chloromethane (-/135%) above QC limits. Since chloroethane and chloromethane were not detected in the associated samples, no qualifications were necessary.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect except as noted above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14LTM-TB07-GW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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

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

Not applicable.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

Samples 14LF059-LF59MW02-GW-0/14LF059-LF59MW02-GW-1, 14DP098-41755WL05-GW-0/14DP098-41755WL05-GW-1 and 14ST037-WCSD09-SE-0/14ST037-WCSD09-SE-1 (soil) are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters and less than 50% for soils with the following exception: cis-1,2-dichloroethene (76%) in samples 14DP098-41755WL05-GW-0/14DP098-41755WL05-GW-1.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐ Yes ☒ No ☐NA (Please explain.) Comments:

The positive results for cis-1,2-dichloroethene in aqueous samples14DP098-41755WL05-GW-0/14DP098-41755WL05-GW-1 were estimated (J) due to %RPD greater than <30% criteria for waters.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Since the higher of the two results were used in making field decisions, impact to data is minimal.

f. Decontamination or Equipment Blank (If not used explain why).

☒ Yes ☐ No ☐NA (Please explain.) Comments:

Sample JBER-LTMEQUIP-EB-0 was the equipment blank and all QC criteria were met.

i. All results less than PQL?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Soil CCV1236135 (assoc. samples 1144644023, 026 and 027) had %R for acetone (75%) below QC limits of 80-120% and chloroethane (127%) above QC limits. The non-detected results for acetone were estimated (UJ) in samples 1144644023, 026 and 027 due to potential low bias. No action was necessary for chloroethane since it was not detected in the assoc. samples. Aqueous CCV1236828 (assoc. samples 1144644007-009, 011-015, 017) had %R for chloromethane (121%) above QC limits. Since chloromethane was not detected in the assoc. samples, no qualifications were necessary.

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: January 9, 2015

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: November 21, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1145515

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

However, the following samples required dilutions: 14WP014-OU6MW92-GW-0 (VOA 2/10X).

e. Data quality or usability affected?
Comments:

No affect.

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?
Comments:

Not applicable.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

No affect.

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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on samples 14WP014-OUMW67-GW-0 (1145515002) and all recoveries and RPDs were within QC limits with the following exception: RPD for bromomethane (20) and chloromethane (36) were outside QC limits. Since bromomethane was not detected in the parent sample and chloromethane was below LOQ and already (J), no qualifications were necessary. The recoveries for 1,1,2-trichloroethane (182/179%) and 4-Isopropyltoluene (144/149%) were above QC limits. Since 1,1,2-trichloroethane was not detected in the parent sample, no action was necessary. The positive result for 4-Isopropyltoluene was estimated (J) in parent sample 14WP014-OUMW67-GW-0 (1145515002) due to potential high bias.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect except as noted above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14WP014-TB01-GW-0 is the trip blank and all QC criteria were met with the following exception: acetone (3.63 ug/l). The positive acetone result in assoc. sample 14WP014-OU6MW93-GW-01-1 was qualified by the validator with a "B" since sample concentration was less than 10 times the trip blank level.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

See discussion above i.

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

No affect except as noted above.

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14WP014-OU6MW93-GW-0 and 14WP014-OU6MW93-GW-1 are field duplicates. All calculated RPDs were less than the 30% criteria for waters.

ii. Submitted blind to lab?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

See discussion above i.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

See discussion above i.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: January 9, 2015

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: November 24, 2014

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1145639

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

c. Were all corrective actions documented?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

e. Data quality or usability affected?
Comments:

No affect.

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?
      Comments:

      Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

      No affect.

   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:

No metals analysis was performed.

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:

The VOA MS and MSD were performed on sample 14ST037-SP2605-GW-0 and all recoveries and RPDs were within QC limits.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

See discussion above iii.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

No affect.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14ST037-TB02-GW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☐ Yes ☒ No ☐ NA (Please explain.) Comments:

See discussion above i.

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037-OU5MW45-GW-0/-1 and 14ST037-OU5MW13-GW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

See discussion above i.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

See discussion above i.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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

a. Defined and appropriate?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: January 14, 2015

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: January 6, 2015

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1146094

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

It was not mentioned in the case narrative but the original chain of custody was submitted with sample id errors. Weston PM requested by email sample ids be changed; email was included in data package. No action taken.

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

However, the following samples required dilutions: 14ST037-Q4-OU5SP02-SP-0 (VOA 1/10X), PAH (1/10X) and 14ST037-Q4-OU5SP01-SP-0(VOA 1/10X), PAH (1/10X).

e. Data quality or usability affected?
Comments:

No affect.

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?
      Comments:

      Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

      No affect.

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:

No metals analysis was performed.

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:

The VOA and PAH MS and MSD were performed on sample 14ST037-Q4-BPSW01-SW-0 (1146094006) and all recoveries and RPDs were within QC limits.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

Not applicable.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐ NA (Please explain.) Comments:

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:

PAH surrogate terpheny-d14 (174%) recovered slightly below the QC limits of 50-135 in sample 14ST037-Q4-WCSW04-SW-0. Since results were less than LOQ and already estimated (J) or non-detected, no action was necessary.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

No affect except as noted above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14ST037-Q4-TB01-SW-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Samples 14ST037-Q4-OU5CP01-SP-0/-1 and 14ST037-Q4-BPSW01-SW-0/-1 are field duplicate pairs. All calculated RPDs were less than the 30% criteria for waters.

ii. Submitted blind to lab?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

No affect.

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Laboratory Data Review Checklist

Completed by: Diane Quigley

Title: WESTON Senior Technical Manager Date: January 14, 2015

CS Report Name: 2014 Annual Field Activities Report, CERCLA-regulated sites Report Date: January 6, 2015

Consultant Firm: Weston Solutions

Laboratory Name: SGS-Anchorage, AK Laboratory Report Number: 1146095

ADEC File Number: 2101.38.005.01 ADEC RecKey Number:

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 (Please explain.) Comments:

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, Volatile Chlorinated Solvents, etc.)?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

No affect except as mentioned in this report.

4. Case Narrative
a. Present and understandable?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

It was not mentioned in the case narrative but the original chain of custody was submitted with sample id errors. Weston PM requested by email sample ids be changed; email was included in data package. No action taken.

c. Were all corrective actions documented?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?
Comments:

No affect except as noted.

5. Samples 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:

These are water 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:

e. Data quality or usability affected?
Comments:

No affect.

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?
      Comments:

      Not applicable.

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      ☐ Yes ☐ No ☒ NA (Please explain.) Comments:

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

      No affect.

   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:

No metals analysis was performed.

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:

A VOA MS and MSD were not performed for Prep Batch VXX 26896, therefore, matrix affect could not be determined. However, an LCS and LCSD were performed and all QC criteria were met. Impact to data usability is minimal.

iv. Precision – All relative percent differences (RPD) 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:

See discussion above iii.

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

See discussion above iii.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No x NA (Please explain.) Comments:

Not applicable.

vii. Data quality or usability affected? (Use comment box to explain.)
Comments:

No affect.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

☐ Yes ☐ No ☒ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

No affect except as noted above.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

Sample 14LF04-Q4-TB01-SP-0 is the trip blank and all QC criteria were met.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

See discussion above i.

v. Data quality or usability affected? (Please explain.)

Comments:

No affect.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

☒ Yes ☐ No ☐ NA (Please explain.) Comments:

However, a field duplicate was not submitted with this SDG.

ii. Submitted blind to lab?

☐ Yes ☐ No ☒NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☐ Yes ☐ No ☒NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

No affect.

f. Decontamination or Equipment Blank (If not used explain why).

☐ Yes ☐ No ☒NA (Please explain.) Comments:

No decon/equipment blanks were required for this project since disposable equipment was used.

i. All results less than PQL?

☐ Yes ☐ No ☒NA (Please explain.) Comments:

See discussion above.

ii. If above PQL, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected? (Please explain.)

Comments:

No affect.

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

a. Defined and appropriate?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

1250245 CCV (assoc. samples –ALL) recovery for cis-1,3-dichloropropane (123%) recovered above QC limits of 80-120%. The non-detected results for cis-1,3-dichloropropane were estimated (UJ) in all samples, direction of bias uncertain.

Historical Data DP089 and Mann Kendall Outcome

Historical Data DP098 and Mann Kendall Outcome					
41755WL-01					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1999	ND [0.5]	0.8	---	---	---
2000	R	**7.29 J**	0.94	R	R
2001	**9.5 J**	**ND [5.9]**	ND [5.8]	ND [6]	**ND [10.6]**
2004	ND [0.2]	0.36	2.5	ND [0.28]	ND [0.27]
2005	ND [7.6]	**ND [6.2]**	ND [2]	**ND [7.2]**	**ND [2.4]**
2006	ND [0.31]	ND [0.31]	0.87 J	ND [0.31]	ND [0.31]
2007	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
8/2012	ND [0.45]	0.18 J	0.41 J	ND [0.45]	ND [0.45]
41755WL-02					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1999	**2,800**	**2,300**	**4,200**	**9.1**	---
2000	**2,989**	**2,288**	**2,490**	6.9	0.61 J
2001	**6,400**	**4,400**	**4,000**	R	R
2004	**1,100**	**1,000**	**2,600**	**10**	1.2
2005	**1,300**	**1,100**	**2,500**	R	R
2006	**1,240**	**1,870**	**6,370**	**12.7 J**	1.36
2007	**1,020**	**1,230**	**2,910**	**7.59**	ND[0.31]
2009	**1,300**	**1,300**	**2,000**	5.1	0.62 J
2010	**650**	**1,200**	**2,100**	2.8	ND [0.25]
2011	**1,300 J**	**1,100 J**	**2,900 J**	**ND [20] J**	**ND [20] J**
8/2012	**450**	**570**	**1,400**	2.4	0.31 J
8/2013	**650**	**720**	**1,200**	**ND [20]**	**ND [20]**
7/2014	**390**	**445**	**1,690**	4.18	0.510 J
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing	Decreasing	NS	NS
41755WL-03					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1999	---	**47**	**2,100**	---	---
2000	ND [0.12]	**9.19**	**1,054**	2.58	0.95 J
2001	R	**120**	**2,200**	6.5 J	R
2006	ND [0.31]	1.65	**423**	2.12 J	1.95
2007	ND [0.31]	**5.46**	**753**	3.01	**1.61**
2009	ND [1]	1.2	**1,100**	3.7	**ND [50]**
2010	0.26	1.6	**580**	1.9	**0.91**
2011	ND [2]	1.4	**410**	1.7	**ND [4]**
8/2012	1 J	**22 J**	**490**	1.3 J	**1.2 J**
7/2014	ND [0.5]	0.8 J	**499**	1.45	1.17
2014 Mann-Kendall Test Outcome	NS[1,4]	Decreasing	Decreasing	Decreasing	NS

41755WL-04					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1999	---	**5,000**	**2,200**	**9.40**	---
2000	1.20 J	**3,778**	**2,480**	**11.7 J**	0.54 J
2001	R	**3,800**	**3,200**	**19.0 J**	R
2006	ND [0.31]	**620**	**7,660**	**28.4**	**5.27**
2007	ND [0.31]	**182**	**3,430**	**15.7**	**5.25**
2009	ND [1]	**310**	**2,400**	**14**	**4.5**
2011	**ND [5]**	**ND [10]**	**1,500**	**7.1**	**1,200**
8/2012	0.24 J	**8.9**	**1,200**	4.9	**1500**
8/2013	**ND [8]**	**ND [16]**	**880 J**	**ND [16]**	**1,400 J**
7/2014	ND [0.5]	**6.95**	**585**	2.63	**553**
2014 Mann-Kendall Test Outcome	NS[1,4]	Decreasing	Decreasing	NS	NS
41755WL-05					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1999	ND [0.5]	**5.7**	**5,700**	---	---
2000	**10.17**	**8.9**	**3,899**	5.88	**12.3**
2001	**ND [11]**	**ND [12]**	**4,700**	**ND [12]**	**ND [22]**
2004	**6.2**	**29**	**3,300**	4.9	**15**
2005	**ND [38]**	**ND [31]**	**4,000**	**ND [36]**	**17 J**
2006	ND [0.31]	ND [0.31]	**3,290**	5.4	1.36
2007	ND [0.31]	0.630 J	**2,320**	4	**13.8**
2009	ND [1]	0.62 J	**2,300**	6.1	**15**
2010	ND [0.15]	0.94	**1,700**	3	**9.5**
2011	**ND [20]**	**ND [40]**	**3,900**	**ND [40]**	**ND [40]**
8/2012	ND [0.45]	2.9	**2,000**	2.7	**18 J**
8/2013	ND [0.20]	1.4 J	**1,400**	1.5 J	**7 J**
7/2014	ND [0.5]	ND [0.5]	**4680 J**	3.54	**7.1**
7/2014	ND [0.5]	0.52 J	**2100 J**	3.37	**6.54 J**
2014 Mann-Kendall Test Outcome	NS[1,4]	NS	Decreasing	Decreasing	NS
41755WL-07					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2000	3.26	1.05	0.51 J	ND [0.13]	ND [0.13]
2001	0.31 J	ND [0.12]	ND [0.12]	ND [0.12]	ND [0.22]
2006	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2007	ND [0.31]	ND [0.31]	2.52	ND [0.31]	ND [0.31]
2008	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2009	ND [1]	ND [1]	0.74 J	ND [1]	ND [1]
2010	ND [0.15]	ND [0.15]	ND [0.2]	ND [0.15]	ND [0.25]
2011	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
8/2012	ND [0.45]	ND [0.45]	3.2	ND [0.45]	0.48 J
8/2013	ND [0.2]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.4]
7/2014	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]
2014 Mann-Kendall Test Outcome	NS[1,3]	NS[1,3]	NS	Increasing[1,2]	Increasing[1,3]

41755WL-08					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1997	---	**9.96**	---	---	---
1999	---	**22**	---	---	---
2000	ND [0.12]	**30.2**	15.6	ND [0.13]	ND [0.13]
2001	ND [0.11]	**52**	15	ND [0.12]	ND [0.22]
2006	0.35 J	**149**	44.9	ND [0.31]	ND [0.31]
2007	ND [0.31]	**164**	67	ND [0.31]	ND [0.31]
2009	ND [1]	**290**	**170**	0.94 J	ND [1]
2009	ND [1]	ND [1]	**175**	0.71 J	ND [1]
2010	ND [0.15]	**250**	**160**	ND [0.15]	ND [0.25]
2011	ND [1]	**260**	**220**	0.94	**ND [2.0]**
8/2012	ND [0.45]	**280**	**290**	0.74 J	ND [0.45]
8/2013	ND [0.2]	**270**	**240**	0.72 J	ND [0.40]
7/2014	ND [0.5]	**299**	**275**	0.630 J	ND [0.5]
2014 Mann-Kendall Test Outcome	NS[1,3]	Increasing	Increasing	Increasing	Increasing[1,2]
41755WL-09					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2000	1.13	0.48	0.18	ND [0.13]	ND [0.13]
2001	0.29	ND [0.12]	ND [0.12]	ND [0.12]	ND [0.22]
2006	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2007	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2008	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
2011	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
8/2012	ND [0.45]	0.33 J	0.2 J	ND [0.45]	ND [0.45]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
7/2014	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]	ND [0.5]
2014 Mann-Kendall Test Outcome	NS[1,4]	NS[1,4]	Increasing[1,4]	Increasing[1,2]	Increasing[1,2]
41755WL-12					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
1997	ND [0.5]	ND [0.5]	---	---	---
1999	ND [0.5]	ND [0.2]	---	---	---
2000	ND [0.12]	ND [0.15]	ND [0.13]	ND [0.13]	ND [0.13]
2001	ND [0.11]	ND [0.12]	ND [0.12]	ND [0.12]	ND [0.22]
2004	ND [0.2]	ND [0.18]	ND [0.07]	ND [0.28]	ND [0.27]
2005	ND [0.38]	ND [0.31]	ND [0.1]	ND [0.36]	ND [0.12]
2010	ND [0.15]	ND [0.15]	0.28	ND [0.15]	ND [0.25]
8/2012	ND [0.45]	ND [0.45]	ND [0.45]	ND [0.45]	ND [0.45]

41755WL-15					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2000	0.14 J	ND [0.15]	ND [0.13]	ND [0.13]	ND [0.13]
2001	ND [0.11]	ND [0.12]	ND [0.12]	ND [0.12]	ND [0.22]
2007	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
41755WL-16					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2000	ND [0.12]	ND [0.15]	1.8	ND [0.13]	ND [0.13]
2001	ND [0.16]	ND [0.12]	ND [0.12]	ND [0.12]	ND [0.22]
2004	ND [0.2]	ND [0.18]	ND [0.07]	ND [0.28]	ND [0.27]
2005	ND [0.38]	ND [0.31]	ND [0.1]	ND [0.36]	ND [0.12]
2007	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
41755WL-17					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2000	ND [0.12]	ND [0.15]	0.14	ND [0.13]	ND [0.13]
2001	ND [0.11]	ND [0.12]	0.24	ND [0.12]	ND [0.22]
2004	ND [0.2]	ND [0.18]	0.39	ND [0.28]	ND [0.27]
2005	ND [0.38]	ND [0.31]	0.32 J	ND [0.36]	ND [0.12]
2010	ND [0.15]	ND [0.15]	0.38	ND [0.15]	ND [0.25]
8/2012	ND [0.45]	ND [0.45]	0.49 J	ND [0.45]	ND [0.45]
41755WL-23					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2002	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
2007	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
8/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
DP98SW-03					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2000	ND [0.12]	ND [0.12]	ND [0.12]	ND [0.09]	ND [0.13]
2010	ND [0.15]	ND [0.15]	0.18	ND [0.15]	ND [0.25]
9/17/14	ND [0.5]	ND [0.5]	1.56	ND [0.5]	ND [0.5]
DP98SW-10					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2002	ND [0.11]	**8.9**	1.1	ND [0.12]	ND [0.22]
2010	ND [0.15]	**8.9**	57	0.26	ND [0.25]
9/17/14	0.31 J	**15.3**	60.5	ND [0.5]	ND [0.5]

DP98INJ-02					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2005-1	**ND [9.2]**	**4,920**	**6,340**	**22**	**ND [6.2]**
2005-2	**ND [9.2]**	**1,980**	**4,690**	ND [4.4]	**ND [6.2]**
2006-1	**ND [6.0]**	**ND [5.4]**	**11,100**	**44**	**74**
2006-2	**ND [15]**	**ND [13.5]**	**7,820**	**ND [23]**	**ND [19]**
2008	ND [1]	**15**	**11,000**	**44**	**200**
2009	ND [1]	0.66 J	**11,000**	**38**	**79**
2011	**ND [40]**	**ND [80]**	**8,600**	**29**	**260**
8/2012	ND [0.45] J	1.3 J	**9,300**	**18 J**	**400 J**
9/2013	**ND [40]**	**ND [80]**	**5,400**	**ND [80]**	**940**
7/2014	ND [0.5]	1.14	**3,990**	**18.9**	**2960**
2014 Mann-Kendall Test Outcome	NS[1,2]	NS	NS[1]	NS	Increasing
DP98SW-01					
Year	PCE	TCE	cis-DCE	1,1-DCE	VC
2005	ND [0.38]	ND [0.31]	ND [0.1]	ND [0.36]	ND [0.12]
2006	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2007	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2008	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]	ND [0.31]
2009	ND [1]	ND [1]	ND [1]	ND [1]	ND [1]
2010	0.16	ND [0.15]	ND [0.2]	ND [0.15]	ND [0.25]
2011	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
8/2012	ND [0.2]	ND [0.4]	ND [0.4]	ND [0.4]	ND [0.4]
9/2013	ND [0.20]	ND [0.40]	ND [0.40]	ND [0.40]	ND [0.40]
7/2014	ND [0.5]	ND [0.5]	1.00	ND [0.5]	ND [0.5]
2014 Mann-Kendall Test Outcome	NS[1,4]	NS[1,2]	Increasing[1,3]	NS[1,2]	Increasing[1,2]

Notes:

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

[1]Trend analysis not reliable indicator of GW trends because of high censoring

[2]No detections

[3]Only one detection

[4]Only two detections

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

Historical Data FT023 and Mann Kendall Outcome

Historical Data FT023 and Mann-Kendall Outcome				
GW-5A				
Date	Benzene	TCE	PCE	cis-1,2-DCE
10/9/86	ND [0.25]	---	---	---
5/25/93	0.95	**46**	2.2	20
7/31/93	**20.5**	**16**	1.2	9.7
6/13/08	0.8	**49**	4.1	20
6/16/08	ND [0.12]	**31**	2.7	41
6/16/09	ND [0.12]	**29**	2.2	32
9/18/14	0.59	**33.2**	3.1	38.4
2014 Mann-Kendall Test Outcome	NS	NS	NA	NA
407MW-01				
Date	Benzene	TCE	PCE	cis-1,2-DCE
6/23/09	1	1.5	0.19 F	1.7
6/11/10	ND [0.2]	1	ND [0.2]	1.5
9/15/11	0.24 J	1.5	ND [0.2]	1.6
8/9/12	ND [0.2]	0.91 J	ND [0.2]	ND [0.4]
9/13/13	ND [0.2]	0.63 J	ND [0.2]	0.62 J

OU4W-11				
Date	Benzene	TCE	PCE	cis-1,2-DCE
7/28/93	**142**	**33**	**78**	**741**
8/19/93	ND [1.8]	---	---	---
8/30/93	**104**	**25**	**41**	**476**
6/7/95	**192**	**56**	**52**	**904**
6/7/95	**136**	---	---	---
9/12/95	**35**	**65**	**44**	**241**
9/12/95	**29**	---	---	---
6/5/96	**22**	**12**	**21**	**462**
6/5/96	**28**	---	---	---
10/2/96	**13**	**37**	**21**	**182**
10/2/96	**12**	**28**	**20**	**195**
10/2/96	**13**	---	---	---
10/2/96	**13**	---	---	---
5/22/97	**22**	**28**	**50**	**470**
8/29/97	**15**	**45**	**27**	**170**
5/28/98	**20**	**77**	**56**	**247**
5/28/98	**19**	**78**	**56**	**239**
5/28/98	**18**	---	---	---
5/28/98	**19**	---	---	---
8/13/98	**10**	**94**	**50**	**125**
8/13/98	**11**	---	---	---
6/6/99	**11**	**68**	**43**	**260**
8/12/99	**6.1**	**48**	**29**	**400**
6/3/00	**ND [11]**	**96**	**53**	**340**
8/8/00	**6.3**	**59**	**43**	**320**
8/8/00	**7.5**	**75**	**52**	**460**
6/11/01	4.3	**78**	**38**	**400**
6/11/01	4.4	**73**	**41**	**410**
8/21/01	ND [1.1]	**37**	**30**	**360**
6/25/02	3.8	**53**	**33**	**390**
6/25/02	3.8	**49**	**33**	**400**
8/21/02	3.2	**20**	**22**	**340**
8/21/02	3.4	**24**	**24**	**360**
8/21/02	3.2	**19**	**21**	**330**
6/16/03	3.3	**12**	**17**	**410**
7/13/04	3.1	**11**	**12**	**340**
7/13/04	3.4	**11**	**11**	**350**
7/11/05	2.1	**15**	**16**	**200**
7/11/05	2.2	**13**	**15**	**210**
7/10/06	2.2	**7.3**	**5.7**	**220**
7/10/06	2.4	**6.8**	**5.8**	**230**
6/19/07	3.5	---	---	---
6/19/07	1.7	**30**	**26**	**140**
6/13/08	2.6	**12**	**13**	**160**
6/16/09	2.1	**13**	**14**	**140**
8/1/12	0.88 J	**6.7**	**7.7**	**81**
9/12/13	0.96 J	**22**	**16**	**73**
9/18/2014	1.23	**15**	**18**	**110**
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing	Decreasing	Decreasing

Notes:

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

NA= Mann-Kendall Test not preformed.

[1]Trend analysis not reliable indicator of GW trends because of high censoring

[2]No detections

[3]Only one detection

[4]Only two detections

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

Historical Data LF002

Historical Data LF002

LF02SP-01

Year	DRO	GRO	TAH	TAqH	BEHP	PCA	TCE	Selenium	Thallium
2002	---	---	---	---	---	0.44 J	---	---	---
2004	---	---	---	---	---	0.5	---	---	---
2005	---	---	---	---	---	ND [0.37]	---	---	---
2006	---	---	---	---	---	ND [0.15]	---	---	---
2007	---	---	---	---	---	ND [0.15]	ND [0.3]	---	---
2009	---	---	---	---	ND [5]	ND [1]	ND [1]	0.35 J	0.27 B
2010	100	ND [44]	1.0	1.7	**ND [6]**	ND [0.15]	0.16	---	---
2011	56	17 J	---	---	---	---	---	---	---
9/2013	---	---	1.32	1.91	---	ND [0.20]	0.17 J	---	---

53WL-02

Year	DRO	GRO	BEHP	PCA	TCE	Selenium	Thallium
1993-1	---	ND	---	1 J	**ND [10]**	15	---
1994-1	---	---	ND [0.8]	**4.63**	0.72	21.5	**25**
1994-2	---	---	ND [0.9]	**4.66**	0.74	1.02	**55.6**
2009-1	---	---	ND [5]	0.53 J	1.4	0.31 J	0.21 B
2010-1	ND[57]	ND [44]	---	---	---	---	---
2011-1	ND [71]	ND [25]	---	---	---	---	---

65WL-04R

Year	DRO	GRO	PCA	TCE
2009-1	---	---	ND [1]	ND [1]
2010-1	46	ND [44]	---	---
2011-1	ND [73]	ND [25]	---	---

53WL-05

Year	DRO	GRO	BEHP	MeCl	PCA	TCE	Selenium	Thallium
1993-1	---	ND [0.05]	---	**ND [10]**	**ND [10]**	**ND [10]**	30	---
1994-1	---	---	ND [0.78]	0.53	ND [0.17]	ND [0.04]	13.1	**8.9**
1996-1	ND [0.0446]	ND [0.00543]	---	---	ND [0.227]	---	---	---
1997-1	ND [0.25]	ND [0.1]	---	---	ND [0.34]	---	---	---
1997-2	ND [0.25]	ND [0.1]	---	---	ND [0.34]	---	---	---
1998-1	ND [0.0221]	ND [0.00427]	---	---	ND [0.102]	---	---	---
1998-2	ND [0.0219]	ND [0.0106]	---	---	ND [0.102]	---	---	---
1999-1	ND [0.5]	ND [0.025]	---	---	ND [0.17]	---	---	---
1999-2	0.06	ND [0.025]	---	---	ND [0.17]	---	---	---
2000-1	ND [0.5]	0.035	---	---	ND [0.14]	---	---	---
2000-2	ND [0.02]	0.071	---	---	ND [0.138]	---	---	---
2001-1	0.023	0.0389	---	---	ND [0.138]	---	---	---
2001-2	ND [0.019]	ND [0.0206]	---	---	ND [0.138]	---	---	---
2002-1	---	---	---	---	ND [0.138]	---	---	---
2002-2	---	---	---	---	ND [0.138]	---	---	---
2003-1	---	---	---	---	ND [0.13]	---	---	---
2006-1	---	---	---	---	ND [0.15]	---	---	---
2007-1	---	---	---	---	ND [0.15]	---	---	---
2009-1	---	---	ND [4.9]	ND [1]	ND [1]	ND [1]	0.3 J	0.17 B
2010-1	ND [58]	ND [44]	---	---	---	---	---	---
2011-1	ND [71] J	ND [25]	---	---	---	---	---	---

OU6MW-49				
Year	DRO	GRO	PCA	TCE
1994-1	---	---	**45.1**	**5.39**
1994-2	---	---	**10.8**	4.49
1996-1	---	---	**34.8**	---
1996-2	---	---	**7.09**	---
1997-1	---	---	ND [0.34]	---
1997-2	---	---	**6.80**	---
1998-1	---	---	**7.93**	---
1998-2	---	---	**27.5**	---
1999-1	---	---	**45**	---
1999-2	---	---	**24**	---
2000-1	---	---	**20**	---
2000-2	---	---	**26**	---
OU6MW-49R				
2001-2	0.044	---	**9.6**	4.50
2002-1	---	---	**12**	3.80
2002-2	---	---	**9.5**	3.80
2003-1	---	---	2.6	---
2006-1	---	---	ND [0.15]	---
2007-1	---	---	0.73	1.86
2009-1	---	---	1	2.1
2010-1	ND [57]	ND [44]	---	---
2011-1	ND [72]	ND [25]	---	---

Historical Data LF004 and Mann Kendall Outcome				
OU6MW-67				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
1994-1	**9.65**	9.05	11.40	ND [0.23]
1994-2	**42.5**	18.8	83.80	**ND [9.89]**
1996-1	**7.22**	4.41	6.07	ND [0.87]
1996-2	4.28	2.04	1.76	ND [2.5]
1997-1	2.1	1.9	0.64	ND [0.15]
1997-2	2.5	1.7	0.93	ND [0.15]
1998-1	3.55	1.21	0.62	ND [0.03]
1998-2	4.15	1.24	0.66	ND [0.03]
1999-1	**12**	2.5	0.73	ND [0.16]
1999-2	**11**	4.2	0.70	ND [0.16]
2000-1	ND [0.11]	8.8	0.88	ND [0.11]
2000-2	3.1	5.9	0.48	ND [0.11]
2001-1	2.8	2.9	0.61	ND [1.1]
2001-2	ND [0.53]	2.3	0.70	ND [0.58]
2002-1	1.7	1.3	---	ND [0.11]
2002-2	1.6	1.7	---	ND [0.11]
2007	ND [0.12]	ND [0.31]	ND [0.31]	---
2009	1.5	0.77 J	0.35 J	ND [1]
2011	2.1	1	0.43 J	ND [0.4]
8/2013	5.2	0.86 J	0.38 J	ND [0.40]
11/2014	**8.22**	2.48	ND [0.5]	ND [0.25]
2014 Mann-Kendall Test Outcome	NS	Decresing	Decreasing	NA
LF04SP-02				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2002-1	**37**	220	86	ND [0.46]
2002-2	**9.5**	4.7	0.15 J	ND [0.1]
2003	**70**	150	40	---
2004	**50**	34	7.8	---
2005	**30**	36	10	---
2006	ND [0.12]	0.32 J	ND [0.31]	---
2007	2.0	ND [0.31]	ND [0.31]	---
2008	**89 E**	207 E	8.32	---
2009	4.5	94	4.8	ND [1]
2010	**56**	640	24	ND [0.2]
2011	4	15	ND [0.4]	ND [0.4]
8/2012	2	2.5	ND [0.4]	ND [0.4]
9/2013	1.9	9.4	ND [0.4]	ND [0.4]
9/2014	**17.0**	127	ND [0.5]	ND [.25]
2014 Mann-Kendall Test Outcome	decreasing	NS	NS	NS[1,2]

OU6MW-61				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
1994-1	**3,140**	24.8	52.4	**32.6**
1994-2	**3,400**	15.3	38.1	**38.7 J**
2010	**1,300**	63	280	ND [0.2]
2011	**1,100**	45	150	**ND [10]**
OU6MW-63				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
1994-1	**337**	451	27	2.52
1994-2	**206**	344	9.87	0.63
1996-1	**5.7**	10.1	0.17	ND [0.12]
1996-2	**5.15**	34.5	ND [0.6]	ND [1.25]
1997	**21**	110	0.89	ND [0.15]
1998-1	**15.2**	31.6	ND [0.05]	ND [0.03]
1998-2	4.52	29.1	0.196	ND [0.03]
1999-1	**27**	10	0.48	0.58
1999-2	**12 M**	13	0.48	ND [0.16]
2000-1	**42 M**	39	1.5	ND [0.11]
2000-2	**5.3**	36	0.27	ND [0.11]
2001-1	**8.7**	12	0.29	ND [0.11]
2001-2	**7.8**	24	1.2	ND [0.11]
2002	**6.7**	7	0.35 J	ND [0.11]
2003	3.1	---	---	---
2004	**5.6**	---	---	---
2005	**10**	---	---	---
2006	2.27	---	---	---
2007	0.55	0.78	ND [0.31]	---
2009	1	3.7	0.24 J	ND [1]
2010	0.92	2.7	0.57	ND [0.2]
2011	0.41	0.11	ND [0.4]	ND [0.4]
8/2012	0.3 J,B	ND [0.2]	ND [0.4]	ND [0.4]

LF04SP-02DG				
Year	Benzene	Ethyl-benzene	Toluene	1,2-DCA
2002	ND [0.105]	ND [0.1]	ND [0.1]	ND [0.1]
2003	ND [0.14]	---	---	---
2004	1.3	---	---	---
2005	0.6	---	---	---
2006	ND [0.12]	ND [0.31]	ND [0.31]	ND [0.31]
2007	ND [0.12]	ND [0.31]	ND [0.31]	---
2009	0.27 J	2.8	ND [1]	ND [1]
2010	0.15	1.4	0.12	ND [0.2]
2011	ND [0.2]	0.19 J	ND [0.4]	ND [0.4]
8/2012	0.15 J	0.37 J	ND [0.4]	ND [0.4]
9/2013	0.48 J	2.2	ND [0.4]	ND [0.4]
9/2014	ND [0.2]	0.510 J	ND [0.5]	ND [.25]
2014 Mann-Kendall Test Outcome	NS	NS	Increasing[1,3]	NS[1,2]

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

[1]Trend analysis not reliable indicator of GW trends because of high censoring

[2]No detections

[3]Only one detection

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

Historical Data LF059 and Mann Kendall Outcome

Historical Data LF059 and Mann Kendall Outcomes							
LF59MW-03		**LF05GW-2B**		**LF59MW-06R**		**LF59MW-02**	
Date	TCE	Date	TCE	Date	TCE	Date	TCE
9/25/92	**6.2**	10/6/86	2.3	9/26/01	0.57	6/23/09	**6.4**
9/25/92	**6.0**	8/9/88	3.0	6/12/02	0.31	6/1/10	**6.3**
5/25/95	**8.0**	9/9/91	**8.2**	6/16/03	ND [0.12]	8/27/11	**6.4 J**
10/30/95	**7.4**	9/9/91	**5.5**	7/7/04	0.34	8/9/12	**6.8**
10/30/95	**7.4**	6/26/92	3.7	7/21/05	0.37	8/7/13	**7.1**
5/9/96	**8.8**	10/2/92	4.8	7/21/05	0.37	9/15/14	4.96
5/9/96	**8.5**	10/2/92	**6.0**	6/29/06	0.35	9/15/14	**5.26**
5/14/97	**9.9**	5/23/95	**5.8**	6/18/07	0.46	2014 Mann-Kendall Test Outcome	NS
5/14/97	**9.8**	10/25/95	**7.9**	6/13/08	0.27 F		
8/22/97	**7.6**	5/10/96	4.6				
6/9/98	**9.9**	9/11/96	3.8				
6/9/98	**9.9**	5/8/97	2.6				
8/26/98	**10.1**	8/18/97	1.8				
6/16/99	**11.0**	10/12/06	**12.0**				
8/20/99	**8.4**	1/19/07	**13.0**				
6/14/00	**9.0**	1/21/08	**6.8**				
8/22/00	**9.9**						
6/20/01	**9.0**						
6/12/02	**9.9**						
6/25/03	**10.0**						
6/25/03	**9.5**						
7/6/04	**8.8**						
7/6/04	**8.9**						
7/14/05	**8.2**						
7/5/06	**8.0**						
6/13/07	**6.9**						
6/13/07	**6.6**						
6/13/08	ND [0.22]						
6/23/09	**6.8**						
6/1/10	**8.1**						
8/27/11	**9.3 J**						
8/8/12	**8.8**						
8/7/13	**6.2**						
9/12/14	4.37						
2014 Mann-Kendall Test Outcome	NS						

LF59-09SEEP-SE	
Date	TCE
9/11/14	2.29

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

SD015 Historical Data and Mann Kendall Outcome

Historical Data SD015 and Mann-Kendall Outcomes								
OU6MW-17			OU6MW-90			OU6MW-18		
Date	Benzene	TCE	Date	Benzene	TCE	Date	Benzene	TCE
8/8/94	**182**	**23.4**	5/13/98	4.7	**5.5**	8/7/94	**1,380**	**143**
8/8/94	**162**	**23.5**	5/13/98	**5.37**	---	8/7/94	**1,430**	---
8/8/94	**183**	---	9/6/98	**47.1**	**13.1**	8/31/94	**1,180**	**140**
8/8/94	**128**	---	9/6/98	**51.2**	---	8/31/94	**1,000**	---
9/1/94	**204**	**23.9**	6/3/99	**7.9**	**12**	6/11/96	**521**	**151**
9/1/94	**178**	---	8/6/99	4.3	**11**	6/11/96	**814**	---
6/10/96	**174**	**19.5**	5/23/00	ND [0.11]	ND [0.12]	9/11/98	0.11	0.9
6/10/96	**171**	**21.1**	8/7/00	**11**	**6.9**	9/11/98	0.12	---
6/10/96	**172**	---	6/6/01	1	**8.3**	6/3/99	**43**	**33**
6/10/96	**179**	---	8/15/01	ND [0.105]	**10**	8/9/99	**39**	**38**
5/13/98	**75.9**	**21.3**	6/19/02	1.3	**6.1**	5/22/00	**110**	**54**
5/13/98	**84.3**	---	8/14/02	0.37	**8.5**	8/7/00	**9**	**6.4**
6/4/98	**110**	**23.2**	6/24/03	0.15	**7.6**	6/5/01	**41**	**27**
6/4/98	**110**	---	7/21/04	0.81	**7.1**	8/15/01	**41**	**20**
6/3/99	**9.3**	4.5	7/13/05	**10**	**7.4**	6/23/03	**10**	**20**
8/6/99	**78**	**14**	7/13/06	0.27	**7.5**	7/14/04	0.9	**6.6**
5/22/00	**160**	**19**	7/13/06	0.25	**7.1**	7/13/05	**5.9**	**18**
8/7/00	**160**	**18**	10/11/06	ND [0.12]	2.2	7/17/06	4.2	**24**
6/5/01	**64**	**11**	6/20/07	0.76	---	6/20/07	**14**	---
6/5/01	**70**	**11**	6/20/07	0.58	0.22	6/20/07	**15**	**49**
8/16/01	**39**	**11**	6/11/08	Well Dry		6/11/08	**18**	**40**
6/19/02	**13**	**10**	6/24/09	0.99	**5.7**	6/17/09	2.6	**18**
6/19/02	**13**	**11**				6/8/10	0.37 F	**6**
8/14/02	**23**	**9**						
8/14/02	**22**	**8.7**						
6/24/03	**100**	**13**						
7/13/05	**180**	**12**						
7/13/06	**86**	**12**						
10/5/06	**81**	**7.2**						
6/20/07	**120**	---						
6/20/07	**150**	**11**						
6/11/08	**100**	**11**						
6/11/08	**100**	**11**						
6/16/09	**89**	**9.1**						
6/19/09	**88**	**9.1**						
6/7/10	**89**	**8.7**						
9/16/11	**100**	**8.1**						
8/10/12	**110**	**11**						
8/1/13	**92**	**8.7**						
9/12/14	**79.2**	**7.96**						
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing						

Mann-Kendall test for trend performed at significance level of α=0.05

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

SD024 Historical Data

Historical Data SD024	
OU4MW-04	
Date	Benzene
7/1/93	**238**
11/1/93	**266**
7/1/96	**88.6**
11/1/96	**9.92**
4/1/97	**96**
11/1/97	**130**
7/1/98	**45.2**
11/1/98	**36.6**
7/1/99	**21**
11/1/99	**7.8**
7/1/00	**69**
11/1/00	**57**
7/1/01	**41**
11/1/01	**37**
7/1/02	**28**
6/21/07	**7.2**
6/21/07	**9.2**
6/20/08	**7**
6/17/09	**6.2 J**
6/11/10	4.2
9/22/11	1.4
8/14/12	3.3

SD025 Historical Data and Mann-Kendall Outcome

Historical Data SD025 and Mann-Kendall Outcomes							
OU4MW-08R				421MW-01			
Date	Toluene	Benzene	Ethylbenzene	Date	Toluene	Benzene	Ethylbenzene
10/12/2003	6,800	1500 J	1,100	8/1/12	0.4 J	1.2	5.4
10/12/2003	6,800	1,500	1,000	11/18/13	0.33 J	0.56 J	5.9
7/12/2004	16,000	4,400	1,400				
7/11/2005	15,000	4,300	1,500				
7/10/2006	5,200	980	800 J				
6/19/2007	4000 J	540 J	870 R				
6/19/2007	7,400	540 R	870				
6/10/2008	11000 J	350	1,200				
6/15/2009	10000 J	360	1,300				
6/8/2010	11,000	560	1,500				
6/8/2010	10,000	740	1,700				
9/16/2011	12,000	800	1,500				
8/13/2012	31,000	610	1,600				
9/27/13	170 J	ND [2.0]	96				
4/10/2014	4,500	30	630				
9/15/2014	2,220	14.6	499				
2014 Mann-Kendall Test Outcome	NS	Decreasing	NS				

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

SD029 Historical Data and Mann-Kendall Outcome

Historical Data SD029 and Mann-Kendall Outcomes		
IS6-01		
Date	TCE	PCE
8/18/88	**8.1**	**12**
6/9/93	**21**	**20**
7/31/93	**17**	**17**
8/26/93	**23**	**18**
7/29/96	**17**	**14**
10/21/96	**11**	**12**
7/2/02	**10**	**7.5**
8/22/02	**12**	**7.2**
10/14/05	**5.4**	3.8
6/11/08	**6.3**	**5.2**
6/17/09	**5.7 J**	3.8 J
6/16/10	**5.1**	4.1
9/19/11	**5.8**	4.4
9/9/13	3.7	2.9
9/16/14	**6.53**	4.86
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing

Mann-Kendall test for trend performed at significance level of α=0.05

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

ST037 Beaver Ponds Historical Data and Mann-Kendall Outcome

Historical Data Beaver Ponds and Mann-Kendall Outcomes				
BPSW-01				
Date	Benzene	TAH	TAqH	TCE
3/16/10	ND [0.2]	ND	ND	0.26 F
6/5/10	ND [0.2]	ND	3.0	0.52 F
9/7/10	ND [0.2]	0.25 F	0.25 F	0.76 F
12/1/10	ND [0.2]	ND	0.11 F	0.46 F
3/16/11	ND	ND	ND	0.59 F
6/24/11	ND [0.2]	ND	0.2753 F	0.49 F
6/24/11	ND [0.2]	ND	0.0054 F	0.42 F
9/23/11	ND [0.2]	ND	ND	0.67 J
9/23/11	ND [0.2]	ND	0.0364 J	0.67 J
1/11/12	ND [0.2]	ND	0.01	0.85
3/27/12	ND [0.2]	2	2.22	0.67 B
6/25/12	ND [0.2]	2	2.2	1.4
8/16/12	ND [0.45]	2.7	2.91	0.94
12/18/12	ND [0.2]	2	2.18	0.83
3/11/13	ND [0.20]	2.0	2.18	0.32 J
7/1/13	ND [0.20]	2.0	2.18	0.87 J
9/19/13	0.15 J	1.58	1.75	0.77 J
12/12/13	ND [0.20]	2.0	2.18	0.41 J
3/10/14	ND [0.20]	1.44	1.63	0.53 J
3/10/14 FD	ND [0.2]	2	2.19	0.67 J,B
7/8/2014	ND [0.2]	2.7	3.1	0.93 J
7/8/14 FD	ND [0.2]	2.7	3.1	1.07
9/9/14	ND [0.2]	4.2	4.647	ND [0.5]
9/9/14 FD	ND [0.2]	4.2	4.651	ND [0.5]
12/16/14	ND [0.2]	2.7	3.2	0.77 J
12/16/14 FD	ND [0.2]	2.7	3.16	0.76 J

BPSW-03				
Date	Benzene	TAH	TAqH	TCE
3/16/10	ND [0.2]	ND	ND	**5.1**
6/5/10	ND [0.2]	ND	ND	ND [0.2]
9/7/10	ND [0.2]	0.31 F	0.31 F	ND [0.2]
NS	NS	NS	NS	NS
6/24/11	ND [0.2]	ND	0.85	0.22 F
9/23/11	ND [0.2]	ND	7.25	0.23 J
1/11/12	ND [0.2]	ND	0.004	0.84 J
3/27/12	0.49	2.29	7.51	0.57 B
6/25/12	ND [0.2]	2	2.19	0.67
8/16/12	ND [0.45]	2.7	2.89	0.65
12/19/12	ND [0.2]	2	2.28	0.77
3/11/13	0.22 J	2.02	2.22	0.33 J
7/2/13	ND [0.20]	2.0	4.34	1.5
9/19/13	0.22 J	1.56	6.0	1.4
12/13/13	0.19 J	1.99	2.16	0.72 J
3/10/14	0.18 J	1.98	2.24	1.8
7/8/2014	ND [0.2]	2.7	3.1	1.88
9/9/14	ND [0.2]	4.2	4.647	ND [0.5]
12/16/14	Frozen, not sampled			

BPSW-05				
Date	Benzene	TAH	TAqH	TCE
3/16/10	ND [0.2]	ND	ND	**5.1**
3/16/10	ND [0.2]	ND	ND	**5.0**
6/5/10	ND [0.2]	ND	ND	4.6
6/5/10	ND [0.2]	ND	ND	4.3
9/7/10	ND [0.2]	0.24 F	0.24 F	**5.1**
9/7/10	ND [0.2]	ND	ND	**5.1**
12/1/10	ND [0.2]	ND	ND	3.7
12/1/10	ND [0.2]	ND	0.42 F	3.8
3/16/11	ND	ND	ND	3.7
6/24/11	ND [0.2]	ND	ND	4.7
9/23/11	ND [0.2]	ND	0.0108 J	4.5
1/11/12	ND [0.2]	ND	0.02	3.1
3/27/12	ND [0.2]	2	2.22	2.6
6/25/12	ND [0.2]	2	2.2	**6.4**
8/16/12	ND [0.45]	2.7	2.91	2.7
12/19/12	ND [0.2]	2	2.28	4.5
3/11/13	ND [0.20]	2.0	2.18	4.5
7/1/13	0.20 J	1.86	2.04	**6.1**
9/19/13	ND [0.20]	2.0	2.18	**6.5**
12/12/13	ND [0.20]	2.0	2.18	**5.5**
3/10/14	ND [0.20]	2	2.18	**7.3**
7/8/2014	ND [0.2]	2.7	3.1	**7.18**
9/9/14	ND [0.2]	4.2	4.644	**8.31**
12/16/14	ND [0.2]	2.7	3.17	**5.98**
2014 Mann Kendall				Increasing

BPSW-04				
Date	Benzene	TAH	TAqH	TCE
3/16/10	ND [0.2]	ND	ND	4.7
6/5/10	ND [0.2]	ND	ND	**6.9**
9/7/10	ND [0.2]	0.26 F	0.26 F	**7.1**
12/1/10	ND [0.2]	ND	ND	**5.6**
3/16/11	ND	ND	ND	**5.2**
6/24/11	ND [0.2]	ND	ND	**6.5**
9/23/11	ND [0.2]	ND	ND	**7.6**
1/11/12	ND [0.2]	ND	0.01	**6.3**
3/27/12	ND [0.2]	2	2.22	**5.9**
6/25/12	ND [0.2]	2	2.2	**8.4**
8/16/12	ND [0.45]	2.7	2.9	**8.8**
12/19/12	ND [0.2]	2	2.28	**6.3**
3/11/13	ND [0.20]	2.0	2.18	**6.9**
7/1/13	ND [0.20]	2.0	2.18	**8.7**
9/19/13	ND [0.20]	2.0	2.18	**7.9**
12/12/13	ND [0.20]	2.0	2.18	**6.7**
3/10/14	ND [0.20]	2	2.18	**5.6**
7/8/14	ND [0.2]	2.7	3.1	**8.96**
9/9/14	ND [0.2]	4.2	4.644	**6.87**
12/16/14	ND [0.2]	2.7	3.17	**7.61**
2014 Mann Kendall				Increasing

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

Green highlighted values are nondetects and shown on Mann-Kendall graph
markers with no fill or are duplicate samples removed from the trend analys

ST037 OU5 Seeps Historical Data and Mann-Kendall Outcome

Historical Data OU5 seeps and Mann-Kendall Outcomes				
OU5CP-01				
Date	Benzene	TAH	TAqH	TCE
1/19/10	1.10	4.6	6.6	ND [0.2]
2/16/10	ND [0.2]	ND	0.19	ND [0.2]
3/15/10	1.2	8.9	9.2	ND [0.2]
5/3/10	1.4	**11.0**	13.0	ND [0.2]
5/19/10	1.00	5.7	7.7	ND [0.2]
5/19/10	0.93	6.0	7.8	ND [0.2]
6/6/10	1.2	5.3	6.5	ND [0.2]
6/6/10	0.99	4.9	5.8	ND [0.2]
7/7/10	0.39 F	0.85 F	1.16	ND [0.2]
7/29/10	0.31 F	0.31 F	0.31 F	ND [0.2]
9/8/10	0.46	0.97	0.97	ND [0.2]
9/8/10	0.49	0.96	0.96	ND [0.2]
12/2/10	ND [0.2]	0.73 F	0.73 F	ND [0.2]
4/4/11	0.42	3.8	4.6	ND [0.2]
6/27/11	0.36 F	0.46	0.98	0.40 U
9/23/11	0.21 J	0.21 J	1.336	ND [0.2]
1/11/12	0.4 J	3.25	4.82	ND [0.4]
6/25/12	0.4	2.3	3.48	ND [0.4]
8/16/12	0.34 J	1.84	3.75	ND [0.45]
2013 Q1	Frozen, not sampled			
7/2/13	1.1	**13.5**	**17.4**	ND [0.40]
9/19/13	0.80 J	9.31	13.28	ND [0.40]
12/13/13	0.35 J	2.84	3.82	ND [0.40]
3/10/14	Frozen, not sampled			
7/8/14	1.03	**14**	**17.4**	ND [0.5]
9/9/14	ND [0.2]	**12.44**	14.544	ND [0.5]
12/16/14	0.17 J	2.73	3.41	ND [0.5]
12/16/14 FD	0.18 J	2.75	3.37	ND [0.5]

OU5CP-02				
Date	Benzene	TAH	TAqH	TCE
5/19/10	ND [0.2]	0.66 F	0.94	ND [0.2]
6/6/10	ND [0.2]	1.00 F	1.00 F	ND [0.2]
7/7/10	ND [0.2]	0.94	1.38	ND [0.2]
7/29/10	ND [0.2]	0.26 F	0.46	ND [0.2]
9/8/10	0.26 F	0.52 F	0.52 F	ND [0.2]
12/2/10	0.39 F	1.86 F	2.19	ND [0.2]
3/15/11	1.9 F	9.1	10.4	ND [0.2]
4/4/11	0.89	7.9	9.5	ND [0.2]
6/25/12	ND [0.2]	3.3	3.66	ND [0.4]
8/16/12	ND [0.45]	1.82	2.54	ND [0.45]
2013 Q1	Frozen, not sampled			
7/2/13	0.36 J	3.73	5.41	ND [0.40]
9/19/13	0.15 J	2.29	2.94	ND [0.40]
12/13/13	0.14 J	2.6	3.96	ND [0.40]
3/10/14	ND [0.2]	1.41	1.77	ND [0.40]
7/8/14	0.28 J	4.9	6.1	ND [0.5]
9/9/14	ND [0.2]	3.94	4.801	ND [0.5]
12/16/14	0.23 J	3.44	4.47	ND [0.5]

WCSW-02				
Date	Benzene	TAH	TAqH	TCE
1/19/10	ND [0.2]	0.51 F	0.51 F	0.31 F
2/16/10	ND [0.2]	ND	ND	0.34 F
3/15/10	ND [0.2]	ND	ND	0.25 F
3/15/10	ND [0.2]	ND	ND	0.23 F
5/3/10	ND [0.2]	ND	0.13 F	ND [0.2]
6/5/10	ND [0.2]	ND	ND	ND [0.2]
9/8/10	ND [0.2]	0.44 F	0.44 F	ND [0.2]
12/2/10	ND [0.2]	ND	0.19	0.36 F
12/2/10	ND [0.2]	ND	ND	0.41 F
3/15/11	ND	ND	ND	0.59 F
6/24/11	ND [0.2]	ND	0.2552	0.40 U
9/23/11	ND [0.2]	ND	0.0179 J	0.15 J
1/11/12	ND [0.2]	ND	0.07	0.79 J
3/27/12	ND [0.2]	1.9	2.2	ND [0.4]
6/25/12	ND [0.2]	1.93	2.11	ND [0.4]
8/16/12	ND [0.45]	2.2	2	0.55 B
12/18/12	ND [0.2]	2	2.2	0.59
3/11/13	ND [0.20]	2	2.27	0.70 J
7/1/13	ND [0.20]	2	2.18	0.15 J
9/17/13	0.17 J	1.72	1.91	0.33 J
12/13/13	ND [0.20]	2	2.19	0.64 J
3/10/14	ND [0.2]	2.00	2.19	0.55 J
7/8/14	ND [0.2]	2.7	3.1	ND [0.5]
9/9/14	ND [0.2]	4.2	4.641	ND [0.5]
9/9/14 FD	ND [0.2]	4.2	4.637	ND [0.5]
9/9/14	ND [0.2]	2.7	3.17	ND [0.5]

WCSW-03				
Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	3.2
6/5/10	ND [0.2]	ND	ND	4.3
9/7/10	ND [0.2]	0.42 F	0.42 F	2.6
12/2/10	ND [0.2]	ND	0.13 F	4.2
3/15/11	ND	ND	ND	2.6
6/24/11	ND [0.2]	ND	ND	4.6
9/23/11	ND [0.2]	ND	ND	4.4
1/11/12	ND [0.2]	ND	0.03	**7.5**
3/27/12	ND [0.2]	2	2.2	4.5
6/25/12	ND [0.2]	2	2.19	0.67
8/16/12	ND [0.45]	1.8	2.01	ND [0.45]
12/18/12	ND [0.2]	2	2.2	2.9
3/11/13	ND [0.20]	2	2.19	3.1
7/1/13	ND [0.20]	2	2.18	4.5
9/17/13	0.21 J	2.24	2.41	5.2 J
12/13/13	ND [0.20]	2	2.18	2.7
3/10/14	ND [0.2]	2.00	2.19	2
7/8/14	ND [0.2]	2.7	3.1	0.37 J
9/9/14	ND [0.2]	4.2	4.637	ND [0.5]
12/16/14	ND [0.2]	2.7	3.13	0.42

OU5SP-01				
Date	Benzene	TAH	TAqH	TCE
6/6/10	**5.6 J**	**116.0**	**135.0**	ND [0.2]
12/2/10	0.27 F	0.27 F	0.27 F	ND [0.2]
6/24/11	4.4	**149.1**	**174.1**	ND[0.4]
6/26/12	4	**131.9**	**147.2**	ND [0.4]
8/16/12	4.1	**12.7**	**76.2**	ND [0.45]
2013 Q1	Frozen, not sampled			
7/1/13	3.1	**112.3**	**119.6**	ND [0.40]
9/19/13	2.8 J	**100.5**	**109.0**	ND [0.40]
2013 Q4	Frozen, not sampled			
3/10/14	3.2	120.36	153.55	ND [0.5]
7/8/14	3.38	141	146.4	ND [0.5]
9/9/14	2.77	**222.49**	**234.18**	ND [0.5]
12/16/14	3.8	140.04	156.7	ND [0.5]

OU5SP-02				
Date	Benzene	TAH	TAqH	TCE
3/15/10	**18 J**	**166.0**	**181.0**	ND [0.2]
6/6/10	**18 J**	**156.0**	**170.0**	ND [0.2]
9/8/10	**22**	**109.0**	**122.0**	ND [0.2]
12/2/10	**23 J**	**130 J**	**146.0**	ND [0.2]
4/4/11	**12**	**131.0**	**145.0**	ND [0.2]
6/24/11	**21**	**110.0**	**124.0**	0.40 U
6/24/11	**19**	**135.5**	**156.5**	0.40 U
1/11/12	**13**	**128.9**	**144.0**	ND [0.4]
3/27/12	**15**	**132.7**	**157.0**	ND [0.2]
6/26/12	**26**	**163.8**	**186.8**	ND [0.4]
8/16/12	**16**	**22.4**	**53.2**	ND [0.45]
3/11/13	**24**	**143.3**	**162.0**	ND [1.6]
7/1/13	**23**	**140.8**	**161.0**	ND [0.40]
9/19/13	**21**	**115.7**	**138.3**	ND [2.0]
12/13/13	**16**	**115.7**	**129.4**	ND [0.40]
3/10/14	Frozen, not sampled			
7/8/14	20.8	122.5	133.6	ND [0.5]
9/9/14	**18.6**	187.5	199.31	ND [0.5]
12/16/14	18.8	**110.58**	**120.52**	ND [0.5]
2014 Mann-Kendall				NS

WCSW-04				
Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	ND [0.2]
6/5/10	ND [0.2]	ND	ND	0.26 F
9/8/10	ND [0.2]	0.38 F	0.38 F	0.39 F
12/2/10	ND [0.2]	ND	ND	ND [0.2]
3/15/11	ND	ND	ND	ND
6/24/11	ND [0.2]	ND	0.0066 F	0.4 F
9/23/11	ND [0.2]	ND	0.018 J	0.39 J
1/11/12	ND [0.2]	ND	0.03	0.27 J
3/27/12	ND [0.2]	2	2.22	0.28
6/25/12	ND [0.2]	2	2.19	0.67
8/16/12	ND [0.45]	1.8	2	0.46 J
12/18/12	ND [0.2]	2	2.21	0.54
3/11/13	ND [0.20]	2	2.24	0.43 J
7/1/13	0.16 J	2	3.82	0.68 J
9/17/13	ND [0.20]	2	2.18	0.29 J
12/13/13	ND [0.20]	2	2.18	0.54 J
3/10/14	ND [0.2]	2.00	2.19	0.43 J
7/8/14	ND [0.2]	2.7	3.1	0.5 J
9/9/14	ND [0.2]	4.2	4.637	ND [0.5]
12/16/14	ND [0.2]	2.7	3.16	ND [0.5]

OU5SP-07				
Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	4.6
6/5/10	ND [0.2]	ND	ND	**5.0**
9/8/10	ND [0.2]	0.55 F	0.55 F	4.2
12/2/10	ND [0.2]	ND	ND	**5.4**
3/15/11	ND	ND	ND	**6.2**
6/27/11	ND [0.2]	ND	ND	4.9
1/11/12	ND [0.2]	ND	0.08	**5.4**
3/27/12	ND [0.2]	2	2.19	3.6
6/25/12	ND [0.2]	2	2.2	**7.7**
8/16/12	ND [0.45]	1.8	1.98	4.5
12/18/12	ND [0.2]	2	3.33	2.8
3/11/13	ND [0.20]	2	2.18	2.5
7/1/13	ND [0.20]	1.42	1.61	2.2
9/17/13	0.33 J	3.43	3.60	2.4
12/13/13	ND [0.20]	2	2.19	2.1
3/10/14	ND [0.2]	2.00	2.18	1.8
7/8/14	ND [0.2]	2.7	3.2	3.65
9/9/14	ND [0.2]	4.2	4.683	ND [0.5]
12/16/14	ND [0.2]	2.7	3.15	1.92

OU5SP-09				
Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	2.6
6/5/10	0.21F	0.21 F	0.21 F	3.4
8/16/12	0.15 J	1.5	1.68	2
9/18/13	0.32 J	2.64	2.83	2.4
9/9/14	ND [0.20]	4.2	4.652	1.75

OU5SP-11				
Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	**6.4**
6/5/10	ND [0.2]	ND	ND	**8.2**
9/7/10	ND [0.2]	0.65 F	0.65 F	**6.9**
12/2/10	ND [0.2]	ND	ND	**9.0**
3/15/11	ND	ND	ND	**9.8**
6/24/11	ND [0.2]	ND	ND	**8.5**
Q3 2011	NS	NS	NS	NS
1/11/12	ND [0.2]	ND	0.02	**9.3**
3/27/12	ND[0.2]	2	2.2	**9**
6/25/12	ND[0.2]	2	2.19	**9.8**
8/16/12	ND [0.45]	1.8	2	**9.2**
3/11/13	ND [0.20]	2	2.19	**8.8**
7/1/13	ND [0.20]	2	2.19	**8.5**
9/17/13	ND [0.20]	2	2.18	**8.2**
12/13/13	ND [0.20]	2	2.19	**7.1**
3/10/14	ND [0.2]	2.00	2.19	**7.8**
7/8/14	ND [0.2]	2.7	3.1	**9.63**
9/9/14	ND [0.2]	4.2	4.646	**8.56**
12/16/14	ND [0.2]	2.7	3.13	**9.7**
2014 Mann-Kendall				NS

OU5SP-10				
Date	Benzene	TAH	TAqH	TCE
3/15/10	ND [0.2]	ND	ND	**6.2**
6/5/10	ND [0.2]	ND	ND	**8.2**
9/7/10	ND [0.2]	0.68 F	0.68 F	**6.6**
12/2/10	ND [0.2]	ND	ND	**8.8**
3/15/11	ND	ND	ND	**9.1**
6/24/11	ND [0.2]	ND	ND	**6.6**
Q3 2011	NS	NS	NS	NS
1/11/12	ND [0.2]	ND	0.01	**7.4**
1/11/12	ND [0.2]	ND	0.01	**7.4**
3/27/12	ND[0.2]	2	2.19	**7.5**
6/25/12	ND[0.2]	2	2.19	**7.7**
8/16/12	ND [0.45]	1.8	2.2	**8.5**
3/11/13	ND [0.20]	2	2.19	**8.1**
7/1/13	ND [0.20]	2	2.18	**7.6**
9/17/13	0.17 J	2.21	2.39	**6.1 J**
12/13/13	Frozen, not sampled			
3/10/14	Frozen, not sampled			
7/8/14	ND [0.2]	2.7	3.1	**7.86**
9/9/14	ND [0.2]	4.2	4.644	**6.62**
12/16/14	ND [0.2]	2.7	3.15	**6.42**
2014 Mann-Kendall				NS

OU5SP-03				
Date	Benzene	TAH	TAqH	TCE
6/5/10	0.7	0.7	0.7	1.2
8/16/12	0.49 J	1.84	2.12	1.5
9/18/13	0.51 J	5.1	5.28	0.39 J
9/9/14	ND [0.20]	4.2	4.639	ND [0.5]

OU5SP-15				
Date	Benzene	TAH	TAqH	TCE
6/5/10	0.99	2.0	2.0	ND [0.2]
8/16/12	0.31 J	1.66	1.91	ND [0.45]
9/18/13	0.44 J	3.56	4.57	ND [0.40] J
9/9/14	ND [0.20]	4.2	4.656	ND [0.5]

OU5SP-17				
Date	Benzene	TAH	TAqH	TCE
6/5/10	ND [0.2]	ND	ND	2.7
8/16/12	ND [0.45]	1.8	1.98	2.5
9/17/13	0.26 J	2.48	2.71	2.7 J
9/9/14	ND [0.20]	4.2	4.666	ND [0.5]

OU5SP-18				
Date	Benzene	TAH	TAqH	TCE
6/5/10	ND [0.2]	ND	ND	0.56 F
8/16/12	ND [0.45]	1.8	2.16	0.64 J
9/17/13	0.23 J	2.32	4.83	0.84 J
9/9/14	ND [0.20]	4.2	4.637	ND [0.5]

WCSD-09 (ug/kg)		
Date	Benzene	TCE
6/28/10	ND	ND
12/30/11	ND	ND
8/28/12	ND [13]	ND [13]
10/11/13	ND [23]	ND [23]
10/11/13	1.9 J	0.77 J
9/16/2014 [1]	0.83 J	ND [1.2]
9/16/2014 [2]	ND [34.4]	ND [34.4]

[1] Sample analyzed using low-level VOC method.

[2] Sample analyzed using medium level (MeOH preserved) VOC method.

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are

ST037 Sentry –Early Warning Wells Historical Data

Historical Data Sentry -Early Warning Wells and Mann Kendall Outcomes

SP2/6-05		NS3-02		SP4/11-03		516MW-02	
Date	TCE	Date	TCE	Date	TCE	Date	TCE
4/14/10	ND [0.2]	4/14/10	0.35 F	4/15/10	0.33 F	10/3/11	0.4 U
7/9/10	ND [0.2]	7/9/10	2.8	7/9/10	0.25 F	6/26/12	ND [0.4]
8/11/11	ND [1.0]	8/11/11	3.4	8/11/11	0.23 F	7/31/12	NS
10/3/11	ND [0.40]	10/3/11	3.7	10/3/11	0.20 J	7/17/13	ND [0.40]
6/26/12	ND [0.4]	6/26/12	1.3	6/26/12	ND [0.4]	11/13/13	ND [0.40]
7/17/13	ND [0.40]	7/17/13	0.17 J	7/31/13	ND [0.40]	7/9/14	ND [0.5]
11/13/13	ND [0.40]	11/13/13	ND [0.40]	11/13/13	0.13 J	11/12/14	ND [0.5]
7/9/14	ND [0.5]	7/9/14	2.66	7/9/14	ND [0.5]		
11/12/14	ND [0.5]	11/12/14	2.98	11/12/14	ND [0.5]		

OU5MW-33		OU5MW-14		OU5MW-31		OU5MW-13	
Date	TCE	Date	TCE	Date	TCE	Date	TCE
4/15/10	0.25 F	4/14/10	ND [0.2]	4/14/10	0.77 F	4/14/10	ND [0.2]
7/9/10	0.47 F	7/9/10	0.25 F	7/9/10	2.3	7/9/10	ND [0.2]
7/9/10	0.42 F	8/11/11	0.33 F	8/11/11	2.4	8/11/11	ND [1.0]
8/11/11	0.41 F	10/3/11	0.33 J	10/3/11	1.8	10/3/11	ND [0.40]
10/3/11	0.33 J	6/26/12	ND [0.4]	6/26/12	1.2	6/26/12	0.17
6/26/12	0.18 J	11/14/12	0.32 J	11/14/12	0.99 J	11/14/12	0.2
7/17/13	0.37 J	7/17/13	0.32 J	7/17/13	0.80 J	7/17/13	ND [0.40]
11/13/13	0.45 J	11/13/13	0.40 J	11/13/13	0.98 J	11/13/13	ND [0.40]
7/9/14	0.51 J	7/9/14	0.41J	7/9/14	1.7	7/9/14	ND [0.5]
11/12/14	0.57 J	11/12/14	0.44 J	11/12/14	1.02	11/12/14	ND [0.5]

OU5MW-05
Non-detect from 1996 through 2014

OU5MW-09
Non-detect from 1992 through 2014

OU5MW-10
Non-detect from 1992 through 2014

OU5MW-11
Non-detect from 1992 through 2014

OU5MW-12
Non-detect from 1992 through 2014

401WL-03
Non-detect from 1992 through 2014

401WL-04
Non-detect from 1992 through 2014

OU5MW-45
Non-detect from 2004 through 2014

OU5MW-01
Non-detect from 1992 through 2012

76WL-01
Non-detect from 1998 through 2011

ST037 Ship Creek Historical Data

Historical Data Ship Creek			
SC-01B		SC-08	
Date	TCE	Date	TCE
6/6/10	ND [0.2]	6/6/10	ND [0.2]
9/23/11	ND [0.2]	6/6/10	ND [0.2]
8/16/12	ND [0.45]	9/23/11	ND [0.2]
9/20/13	ND [0.40]	8/16/12	ND [0.45]
9/9/2014	ND [0.5]	9/19/13	ND [0.40]
		9/9/2014	ND [0.5]

ST037 Slammer Avenue Plume Historical Data and Mann-Kendall Outcome

Historical Data Slammer Avenue Plume and Mann Kendall Outcomes							
OU5MW-06		**OU5MW-07**		**OU5MW-08**		**GW-4A**	
Date	TCE	Date	TCE	Date	TCE	Date	TCE
6/22/95	**45**	6/22/95	**19.0**	6/19/95	0.48	6/20/95	**6.8**
9/19/95	**45**	9/19/95	**18.0**	9/20/95	1.9	9/21/95	**6.8**
6/3/96	**44**	6/3/96	**19.0**	5/31/96	4.7	5/28/96	**6.1**
9/26/96	**46**	9/26/96	**20.0**	5/31/96	3.6	9/25/96	**5.2**
5/28/97	**46**	5/28/97	**17.0**	9/25/96	2.8	5/29/97	**5.5**
9/16/97	**39**	9/9/97	**19.0**	5/29/97	2.3	9/11/97	**8.0**
5/21/98	**36**	5/20/98	**23.0**	9/9/97	2.4	5/16/98	**6.5**
8/10/98	**38**	8/10/98	**31.0**	9/9/97	2.5	5/16/98	**6.5**
8/10/98	**47**	5/14/99	**20.0**	5/18/98	2.6	8/6/98	**6.9**
5/18/99	**34**	7/28/99	**21.0**	8/6/98	3.5	6/3/99	4.9
7/27/99	**33**	5/15/00	**22.0**	5/14/99	2.9	7/28/99	4.2
5/15/00	**28**	7/24/00	**18.0**	5/14/99	2.9	5/16/00	**5.1**
7/24/00	**26**	5/24/01	**19.0**	7/28/99	3.3	8/3/00	**8.4**
5/24/01	**25**	8/6/01	**23.0**	7/28/99	3.2	5/23/01	**11.0**
8/6/01	**29**	6/6/02	**20.0**	5/15/00	4.0	8/2/01	**13.0**
6/10/02	**30**	8/19/02	**24.0**	5/15/00	3.8	6/6/02	**11.0**
8/19/02	**37**	6/30/03	**20.0**	7/18/00	4.4	8/20/02	**11.0**
6/27/03	**30**	7/7/04	**14.0**	7/18/00	4.3	6/25/03	**11.0**
7/7/04	**22**	7/7/05	**16.0**	5/23/01	4.3	6/25/03	**11.0**
7/6/05	**18**	7/20/06	**20.0**	8/2/01	**5.1**	10/12/03	**8.0**
6/27/06	**23**	6/12/07	**16.0**	6/6/02	4.1	7/8/04	4.7
6/27/06	**23**	6/19/08	**17.0**	8/19/02	4.8	7/7/05	4.4
6/11/07	**19**	6/22/09	**15.0**	6/25/03	4.9	7/19/06	**5.1**
6/11/07	**19**	6/2/10	**17.0**	7/8/04	3.6	6/12/07	3.2
6/17/08	**19**	8/27/11	**18 J**	7/7/05	3.5	6/18/08	3.8
6/22/09	**16**	8/20/12	**20.0**	7/19/06	4.4	6/22/09	3.2
6/2/10	**15**	9/4/13	**17.0**	6/13/07	3.7	6/2/10	3.2
6/2/10	**17**	9/8/14	**15.8**	6/18/08	3.3	8/27/11	4.2 J
8/27/11	**14 J**	Mann-Kendall	Decreasing	10/5/09	2.6	8/21/12	4.7
8/21/12	**15**			10/5/09	2.8	9/4/13	**5.0**
9/5/13	**11**			6/2/10	2.1	9/5/14	4.08
9/8/14	**8.61**			8/27/11	1.7 J	Mann-Kendall	Decreasing
Mann-Kendall	NS			8/21/12	1.8		
				9/4/13	2.5		
				9/8/14	2.46 J		
				Mann-Kendall	Decreasing		

Notes:

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from

ST037 Western Plume Historical Data and Mann-Kendall Outcome

Historical Data Western ST037 Plume and Mann-Kendall Outcome					
OU3MW-11		**SP1-02**		**OU5SP-11**	
Date	TCE	Date	TCE	Date	TCE
9/9/93	**140.0**	8/10/92	**33.0**	3/21/08	**7.6**
10/14/93	**100.0**	6/21/95	**33.0**	6/24/08	**7.8**
6/6/95	**98.0**	9/19/95	**49.0**	9/18/08	**7.6**
6/6/95	**97.0**	5/30/96	**50.0**	12/10/08	**7.2**
9/11/95	**88.0**	10/1/96	**34.0**	12/10/08	**7.3**
6/7/96	**51.0**	5/30/97	**30.0**	3/25/09	**8.8**
10/4/96	**92.0**	9/8/97	**21.0**	3/25/09	**9.4**
5/27/97	**94.0**	5/15/98	**17.0**	6/2/09	**9.4**
9/5/97	**76.0**	5/15/98	**17.0**	9/25/09	**7.8**
5/26/98	**103.0**	8/7/98	**22.0**	3/15/10	**6.4**
8/11/98	**99.0**	5/18/99	**20.0**	6/5/10	**8.2**
6/6/99	**88.0**	7/27/99	**18.0**	9/7/10	**6.9**
8/11/99	**72.0**	5/17/00	**19.0**	12/2/10	**9.0**
6/1/00	**94.0**	7/21/00	**30.0**	3/15/11	**9.8**
8/4/00	**79.0**	6/7/01	**21.0**	6/24/11	**8.5**
6/11/01	**86.0**	6/7/01	ND [0.12]	1/11/12	**9.3**
8/22/01	**81.0**	8/1/01	**16.0**	8/16/12	**9.2**
6/5/02	**70.0**	6/11/02	**16.0**	3/11/13	**8.8**
6/5/02	**68.0**	8/20/02	**12.0**	7/1/13	**8.5**
8/16/02	**85.0**	6/30/03	**64.0**	9/17/13	**8.2**
8/16/02	**78.0**	10/12/03	**22.0**	12/13/13	**7.1**
6/30/03	**23.0**	7/1/04	**16.0**	2014 Q1	**7.8**
7/27/05	**52.0**	12/15/04	**22.0**	2014 Q2	**9.63**
7/17/06	**77.0**	6/29/05	**33.0**	9/9/2014	**8.56**
6/5/07	**71.0**	7/21/06	**25.0**	Mann-Kendall	NS
6/16/08	**52.0**	6/13/07	**19.0**		
6/18/09	**49.0**	6/20/08	**16.0**		
6/18/09	**50.0**	6/23/09	**9.1**		
6/3/10	**20.0**	6/7/10	**7.0**		
8/26/11	**45 J**	8/26/11	**6.2 J**		
8/21/12	**48.0**	8/21/12	**5.4**		
11/13/13	**38.0**	9/4/13	**5.3**		
9/5/2014	**18.8**	7/6/05	**9.0**		
Mann-Kendall	Decreasing				

OU5MW-46	
Date	TCE
6/27/08	ND [0.22]
6/27/08	ND [0.22]
6/19/09	ND [0.22]
6/4/10	ND [0.2]
8/6/11	0.40 UJ
8/20/12	ND [0.45]
7/17/13	ND [0.40]
9/4/2014	ND [0.5]

OU5MW-43	
Date	TCE
8/5/04	ND [0.18]
6/28/05	ND [0.31]
7/18/06	ND [0.22]
6/20/08	ND [0.22]
6/4/10	ND [0.2]
8/26/11	0.40 UJ
9/4/13	ND [0.40]

OU5MW-15	
Date	TCE
9/16/92	ND [1]
6/14/07	ND [0.2]
6/23/08	ND [0.2]
6/22/09	ND [0.22]
6/7/10	ND [0.2]
8/27/11	0.40 UJ
8/21/12	ND [0.45]
9/5/13	ND [0.40]
9/8/2014	ND [0.5]

OU5MW-34	
Date	TCE
9/10/02	**42.0**
9/10/02	**42.0**
10/13/03	**44.0**
7/1/04	**39.0**
7/1/04	**41.0**
6/28/05	**45.0**
7/18/06	**51.0**
7/18/06	**52.0**
6/5/07	**43.0**
6/5/07	**44.0**
6/17/08	**35.0**
6/18/09	**34.0**
6/3/10	**40.0**
8/26/11	**34 J**
8/20/12	**40**
9/3/13	**35**
2014	---

OU5SP-15	
Date	TCE
1/18/02	ND [0.12]
9/25/02	ND [0.12]
1/15/03	ND [0.12]
8/12/03	ND [0.18]
7/14/04	ND [0.18]
7/27/05	ND [0.31]
7/26/06	ND [0.22]
6/11/07	0.29
6/24/08	ND [0.22]
6/2/09	ND [0.22]
6/2/09	ND [0.2]
6/5/10	ND [0.2]
8/21/12	ND [0.45]
9/18/13	ND [0.40] J
9/9/2014	ND [0.5]

OU3MW-02	
Date	TCE
9/7/93	**17.0**
9/7/93	**17.0**
10/12/93	**20.0**
10/12/93	**14.0**
7/25/96	**15.0**
10/15/96	**17.0**
7/6/04	**12.0**
7/6/05	**13.0**
7/21/06	**17.0**
6/6/07	**15.0**
6/18/08	**13.0**
6/19/09	**11.0**
6/2/10	**11.0**
8/26/11	**11 J**
8/20/12	**11.0**
9/4/13	**9.9**
9/4/2014	**9.1**
Mann-Kendall	Decreasing

OU5SP-10	
Date	TCE
3/21/08	**6.8**
6/24/08	**7.6**
9/18/08	**7.2**
12/10/08	**6.4**
3/25/09	**7.2**
6/2/09	**6.8**
6/2/09	**7.1**
9/25/09	**8.9**
3/15/10	**6.2**
6/5/10	**7.7**
9/7/10	**6.6**
12/2/10	**8.8**
3/15/11	**9.1**
6/24/11	**6.6**
1/11/12	**7.4**
8/16/12	**8.5**
3/11/2013	**8.1**
7/1/2013	**7.6**
9/17/13	**6.1 J**
2014 Q1	---

403WL-01	
Date	TCE
Summer 2001	**66.0**
6/3/02	**53.0**
10/12/03	**44.0**
6/29/04	**41.0**
7/5/05	**35.0**
7/20/06	**56.0**
8/22/06	**36.0**
9/19/06	**34.0**
5/23/07	**42.0**
5/30/07	**25.0**
6/6/07	**47.0**
9/13/07	**35.0**
6/20/08	**35.0**
6/19/09	**25.0**
6/2/10	**23.0**
8/26/11	**23 J**
8/20/12	**29.0**
9/4/13	**18.0**
9/9/2014	**9.3**
Mann-Kendall	Decreasing

OU5MW-45	
Date	TCE
8/5/04	ND [0.2]
6/29/05	ND [0.3]
7/20/06	ND [0.2]
1/9/07	ND [0.2]
6/12/07	ND [0.2]
3/24/08	ND [0.2]
3/24/08	ND [0.2]
6/12/08	ND [0.2]
3/23/09	ND [0.22]
10/19/09	ND [0.2]
4/15/10	ND [0.2]
7/9/10	ND [0.2]
8/11/11	ND [1.0]
10/3/11	ND [0.4]
6/26/12	ND [0.4]
11/14/12	ND [0.4]
7/17/13	ND [0.4]
11/13/13	ND [0.4]
7/9/14	ND [0.5]
11/12/14	ND [0.5]

OU5MW-44	
Date	TCE
8/5/04	**26.0**
7/6/05	**25.0**
7/21/06	**35.0**
7/21/06	**35.0**
6/7/07	**30.0**
6/18/08	**27.0**
6/23/09	**22.0**
6/23/09	**21 J**
6/4/10	**24.0**
6/4/10	**23.0**
9/28/11	**23.0**
8/21/12	**25.0**
9/5/13	**24.0**
9/8/2014	**21.8**
Mann-Kendall	Decreasing

OU5MW-38	
Date	TCE
7/1/04	**8.5**
6/29/05	**11.0**
7/18/06	**13.0**
6/6/07	**11.0**
6/16/08	**11.0**
6/18/09	**11 J**
6/3/10	**12.0**
8/26/11	**13 J**
8/20/12	**13**
9/3/13	**12**
9/4/2014	**10.9**
Mann-Kendall	NS

OU5SP-09	
Date	TCE
3/21/08	**7.8**
6/24/08	**8.3**
6/24/08	**8.2**
9/18/08	3.9
9/18/08	3.7
12/10/08	2.6
3/25/09	1.9
6/2/09	2.2
9/25/09	3.0
3/15/10	2.6
6/5/10	3.4
8/16/12	2.0
9/18/13	2.4
9/9/2014	1.75
Mann-Kendall	Decreasing

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

ST041 Historical Data and Mann-Kendall Outcome

Historical Data ST041 and Mann-Kendall Outcomes					
ST41SW-13					
Year	Benzene	Ethyl-benzene	Toluene	Xylene	TAH
1999	ND [0.1]	ND [0.1]	ND [0.2]	---	---
2000	**27.7**	**35.6**	4.4	---	---
2008	ND [0.12]	ND [0.31]	ND [0.31]	---	---
2009	ND [1]	ND [1]	ND [2]	---	---
2010	ND [0.15]	ND [0.15]	0.2	0.5	1.0
2011	ND [0.2]	ND [0.2]	ND [0.4]	ND [1.2]	ND [2.0]
8/2012	ND [0.2]	ND [0.2]	ND [0.4]	ND [1.2]	ND [2.0]
8/2013	ND [0.2]	0.12 J	0.44 J	0.66 J,B	1.42
9/2014	ND [0.2]	ND [0.5]	ND [0.5]	ND [1.5]	1.74
2014 Mann-Kendall Test Outcome	NS[1,3]	NS[1,4]	NS	NS	NS

ST41SP-01				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
2005	**93**	49	1.2 J	---
2006	**121**	30.9	0.94 J	---
2007	**100**	42.5	0.72	---
8/2012	**140**	140	ND [0.2]	282

ST41-10R				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
1991	**64**	130	7.7	20
1992-1	**82**	100	ND [2.7]	26
1992-2	**18**	7.7	ND [0.27]	ND [0.41]
1996-1	**330**	415	119	1310
1996-2	**261**	263	112	---
1997-1	**240**	420	190	---
1997-2	**200**	240	93	---
1998-1	**311**	428	67.2	1710
1998-2	**152**	56.5	2.03	291
1999-1	**310**	440	19	---
1999-2	**210**	370	65	---
2000-1	**130**	350	20	---
2000-2	**130**	210	2.6	---
2001-1	**120**	270	3.5	---
2001-2	**130**	170	2.5	---
2002	**90**	210	9.2	---
2003	**82**	180	---	---
2004	**72**	240	---	---
2005	**41**	180	---	---
2006	**45**	129	ND [3.1]	---
2007	**23.5**	101	ND [0.31]	---
2009	**51**	78	0.61 J	340
8/2012	**54**	170	ND [8]	806.4
9/2014	**49**	144	1.27	308
2014 Mann-Kendall Test Outcome	Decreasing	NS	Decreasing	NS

ST41-28				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
1996-1	**651**	**1,470**	**2270**	6,370
1996-2	**737**	**1,360**	**2730**	35
1997-1	**460**	**1,100**	**1700**	---
1997-2	**540**	**1,200**	**1900**	---
1998-1	**367**	**809**	311	2,760
1998-2	**356**	**754**	870	3,450
1999-1	**310**	**1,000**	170	---
1999-2	**270**	**700**	180	---
2000-1	**270**	680	160	---
2000-2	**300**	**950**	230	---
2001-1	**190**	510	63	---
2001-2	**260**	**770**	81	---
2002	**270**	**830**	76	---
2009	**170**	600	10	1,680
2010	**130**	530	8	1,275
2011	**130**	490	ND [4.0]	1,157
8/2012	**80**	440	0.94	---
8/2013	**32**	420	4.9	1,430
9/2014	**90**	**766**	ND [50]	2,190
9/2014	**102**	634	41.0 J	1,950
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing	Decreasing	NS
ST41-16				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
1992-1	**30,000**	**6,100**	**18,000**	**21,000**
1992-2	**18,000**	**4,700**	**20,000**	**15,000**
1996-1	**15,100**	**1,960**	**14,700**	9,040
1996-2	**13,500**	**1,660**	**13,600**	6,500
1997-1	**14,000**	**2,700**	**15,000**	---
1997-2	**16,000**	**2,600**	**16,000**	---
1998-1	**13,600**	**2,480**	**16,300**	8,930
1998-2	**17,600**	**1,840**	**18,900**	7,740
1999-1	**17,000**	**23,000**	**ND [1100]**	---
1999-2	**13,000**	**1,600**	**13,000**	---
2000-1	**13,000**	**2,700**	**17,000**	---
2000-2	**16,000**	**2,200**	**19,000**	---
2001-1	**14,000**	**1,800**	**17,000**	---
2001-2	**11,000**	**1,500**	**12,000**	---
2002	**13,000**	**1,700**	**16,000**	---
2009	**12,000**	**2,200**	**16,000**	8,800
2010	**8,000**	**1,500**	**11,000**	7,500
2011	**7,700**	**1,600**	**9,400**	7,100
8/2012	**5,300**	**1,400**	**7,200**	7,800
8/2013	**6,400**	**1,800**	**10,000**	7,800
9/2014	**5,950**	**1,760**	**7,190**	8,890
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing	Decreasing	NS

ST41-25				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
1991	ND [0.5]	660	ND [1]	460
1992-1	**120**	**1,100**	27	1500
1992-2	**40**	**820**	ND [2.7]	670
1996-1	**80.1**	648	20.6	368
1996-2	**73.4**	**733**	18.3	373
1997-1	**94**	**860**	4.9	---
1997-2	**190**	**800**	5.8	---
1998-1	**154**	**845**	10	453
1998-2	**118**	682	6.88	369
1999-1	**54**	690	ND [5]	---
1999-2	**48**	600	9	---
2000-1	**34**	600	6	---
2000-2	**110**	**960**	250	---
2001-1	**27**	630	6.4	---
2001-2	**33**	590	7.2	---
2002	**8**	66	0.99	---
2006	**53**	240	4.5 J	---
2007	**24.9**	195	3.6	---
2009	**20**	190	4.2	32
2010	**11**	95	4.6	19.5
2011	**18**	74	ND [20]	32
8/2012	**ND [20]**	57 J	ND [40]	ND [120]
8/2013	**29**	49	10	22.3
9/2014	**24.3**	39	3.9	10.6
2014 Mann-Kendall Test Outcome	Decreasing	Decreasing	NS	Decreasing
ST41-20				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
8/2012	ND [0.2]	ND [0.2]	ND [0.4]	ND [1.2]
ST41-30				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
8/2012	ND [0.2]	ND [0.2]	ND [0.4]	ND [1.2]
ST41-34				
Year	Benzene	Ethyl-benzene	Toluene	Xylene
8/2012	ND [0.45]	ND [0.45]	ND [0.45]	---

Notes:

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

TAH = Total Aromatic Hydrocarbons

[1]Trend analysis not reliable indicator of GW trends because of high censoring

[2]No detections

[3]Only one detection

[4]Only two detections

Green highlighted values are nondetects and shown on Mann-Kendall graphs with markers with no fill or are duplicate samples removed from the trend analysis.

WP014 Historical Data and Mann-Kendall Outcome

Historical Data WP014 and Mann-Kendall Outcomes			
LF04SP-03			
Year	Benzene	Ethyl-benzene	Toluene
2002	**9.1**	0.22 J	0.11 J
2007	**22.9**	ND [0.31]	ND [0.31]
2008	0.90	ND [0.31]	ND [0.31]
2009	**25**	ND [1]	ND [1]
2010	**33**	0.33	0.13
2011	**16**	0.2 J	ND [0.4]
6/2012	**7.4**	0.13 J	ND [0.4]
8/2012	2.5	0.1 J	ND [0.4]
12/2012	2.9	ND [0.2]	ND [0.4]
3/2013	3.2	ND [0.20]	ND [0.40]
7/2013	**7.2**	0.24 J	0.48 J
9/2013	3.9 J	11	ND [2.0]
12/2013	0.67 J	ND [0.20]	ND [0.40]
3/2014	4.3	ND [0.20]	ND [0.50]
7/2014	**14.8**	ND [0.5]	ND [0.5]
9/2014	0.340 J	ND [0.5]	ND [0.5]
12/2014	3.29	ND [0.5]	ND [0.5]
2014 Mann-Kendall Test Outcome	Decreasing	NS	Increasing[1,5]
NOTE: Data from 2003 through 2006 are not provided. A location downgradient from the true LF04SP-03 seep was used in 2006 and probably in 2003 through 2005 as well. The discrepancy was discovered in 2007 when signs of surface water were traced up the hill to the true seep, which contains a PVC standpipe.			
LF04SP-04			
Year	Benzene	Ethyl-benzene	Toluene
2002	**5.9**	25.0	1.3
2003	**5.4**	21	1.3
2004	ND [0.044]	ND [0.25]	ND [0.10]
2005	ND [0.18]	8	ND [0.10]
2006	**5.18**	16.8	1.2
2007	**7.7**	14.6	0.96 J
2008	3.79	13.7	1.06
2009	3.9	16	1.1
2010	4.2	18	2.3
2011	1.4 J	5.4	ND [0.80]
8/2012	3.8	16	ND [0.4]
9/2013	**5.1**	0.12 J	ND [0.40]
3/2014	2.7	6.9	0.41 J
7/2014	0.380 J	0.870 J	ND [0.5]
9/2014	**5.12**	16.2	ND [0.8]
12/2014	**5.03**	ND [0.5]	0.71 J
2014 Mann-Kendall Test Outcome	NS	Decreasing	NS

OU6MW-93			
Year	Benzene	Ethyl-benzene	Toluene
2001	ND [0.4]	ND [0.6]	0.27 J
2009	0.13 J	1.4	ND [1]
2010	ND [0.15]	0.72	1.6
2011	ND [0.2]	ND [0.2]	ND [0.4]
8/2012	ND [0.45]	0.18 J	ND [0.45]
8/2013	0.23 J	0.20 J	0.60 J
11/2014	0.22	ND [0.5]	ND [0.5]
2014 Mann-Kendall Test Outcome	NS	NS	NS[1,5]
OU6MW-92			
Year	Benzene	Ethyl-benzene	Toluene
2001	**74**	240	13
2009	**90**	490	13
2010	**59**	**800**	32
2011	**39**	480	9.7
8/2012	**6.2**	91	ND [0.8]
8/2013	**18 J**	550	7.2 J
11/2014	**46.3**	518	6.72
2014 Mann-Kendall Test Outcome	NS	NS	Decreasing
14MW-120			
Year	Benzene	Ethyl-benzene	Toluene
2000	**71**	---	---
2001-1	**170**	310	280
2001-2	**30**	100	45
2002-1	**100**	250	630
2002-2	**170**	410	530
2003	**87**	230	274
2004	**13**	42	23
2005	**12**	37	51
2006	**43.9**	190	190
2007	3.2	21.6	23.9
8/2012	3.6	20	24

14MW-121			
Year	Benzene	Ethyl-benzene	Toluene
2000-1	**19**	---	---
2001-1	**36**	240	440
2001-2	**90**	190	340
2002-1	**190**	530	690
2002-2	**46**	410	440
2003	**18**	190	160
2004	**7.5**	46	68
2005	**7.9 J**	39	58
2006	**14**	50.1	87.9
2007	3.2	38	60.2
8/2012	1	73	55
OU6MW-91			
Year	Benzene	Ethyl-benzene	Toluene
2001	**ND [10.5]**	**1,200**	**3,100**
2002-1	**6.5**	**850**	400
2002-2	3.3	180	110
2003	4.4	51	420
2004	2.6	300	19
2005	**44**	**860**	92
2006	ND [1.2]	185	8.1 J
2007	**11.5**	216	12.2
2009	0.67	230	8.8
2011	**ND [5]**	340	16
8/2013	2.1	490	50

OU6MW-46			
Year	Benzene	Ethyl-benzene	Toluene
1994-1	**1,020**	352	392
1994-2	**1,390**	587	792
1996-1	**979**	546	268
1996-2	**695**	410	164
1997-1	**690**	380	300
1997-2	**500**	130	46
1998-1	**819**	**731**	767
1998-2	**937**	**894**	**1,330**
1999-1	**560**	430	100
1999-2	**470 M**	460	320
2000-1	**400 M**	410	150
2000-2	**390**	520	340
2001-1	**580**	570	580
2001-2	**700**	**720**	**1,000**
2002-1	**480**	650	560
2002-2	**600**	**870**	900
2003	**550**	**700**	---
2004	**400**	480	---
2005	**630**	**810**	---
2006	**406**	603	---
2007	**360**	**714**	869
2009	**330**	570	340
2011	**520**	**1,100**	70
8/2013	**160**	**910**	45 J
OU6MW-13			
Year	Benzene	Ethyl-benzene	Toluene
8/2012	ND [0.2]	ND [0.2]	ND [0.4]

Notes:

Mann-Kendall test for trend performed at significance level of α=0.05

NS = Not Significant; no statistically significant trend identified

[1]Trend analysis not reliable indicator of GW trends because of high censoring.

[2]No detections

[3]Only one detection

[4]Only two detections

[5]Only three detections

Green highlighted values are nondetects and shown on Mann-Kendall markers with no fill or are duplicate samples removed from the trend

C-2 JBER-Richardson

- Analytical Laboratory Data Reports (on CD only)
- Analytical Data QA/QC Summary Report
- ADEC Laboratory Data Review Checklists

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Joint Base Elmendorf-Richardson
Auto Vehicle Maintenance Area Site DA089 and Poleline Line Road Site CG039 Long-Term Monitoring and Treatability Study October 2013 – September 2014 Data Quality Evaluation Report

Introduction

The objective of this data quality evaluation (DQE) report is to assess the data quality of analytical results for groundwater samples collected at the Joint Base Elmendorf-Richardson (JBER) Auto Vehicle Maintenance Area Site DA089 and Poleline Road Site CG039. Samples were collected and analyzed in support of the Preliminary Assessment/Site Investigation at this site. The data may also be used to support future activities such as feasibility studies, risk assessments, fate and transport modeling and remedial actions. Individual method requirements and guidelines from *the United States Air Force, Joint Base Elmendorf-Richardson, Alaska, Environmental Restoration Program, Basewide Uniform Federal Policy Quality Assurance Project Plan (March 2013) (*JBER QAPP) were used in this assessment.

This report is intended as a general data quality assessment designed to summarize data issues.

Analytical Data

This DQE report covers 33 primary samples, 6 field duplicates (FD), 4 equipment blanks (EB) and 13 trip blanks (TB). All samples were collected October 15, 2013 through September 15, 2014. A list of samples associated with this DQE is included in Appendix A.

The Work Plan requires a collection frequency of 10 percent for FDs and 5 percent for MS/MSD sets and EBs; collection frequencies are outlined by method in Table 2-1 below. The required frequency was met for each method with the following exceptions:

- A FD and MS/MSD were not collected for Methods AK101 and AK102.
- The laboratory does not perform MS/MSD analysis for Methods E310.1 or RSK175.

Table 1

Percentage of FD, EB and MS/MSD Collected by Method

Method	Matrix	Count of Primary Samples	Count of FD	Percent of FD	Count of MS/MSD	Percent of MS/MSD	Count of EB	Percent of EB
AK101	Groundwater	1	0	0	0	0	1	100
AK102	Groundwater	1	0	0	0	0	1	100
E300.0	Groundwater	33	6	18	6	18	4	12
E300.0M	Groundwater	17	3	18	3	18	2	12
E310.1	Groundwater	18	2	11	0	0	2	11

Table 1

Percentage of FD, EB and MS/MSD Collected by Method

E353.2	Groundwater	33	6	18	7	21	4	12
E376.2	Groundwater	18	4	22	5	28	3	17
RSK-175	Groundwater	33	6	18	0	0	4	12
SW6010B/C	Groundwater	33	6	18	6	18	4	12
SW8260C	Groundwater	33	6	18	5	15	4	12
SW9060	Groundwater	18	4	22	5	28	3	17

The sample results were reported as 12x sample delivery groups (SDG) presented in Table 2. The analyses were performed by Applied Sciences Laboratory in Corvallis, Oregon.

Table 2
Sample Delivery Groups

M3042
M3043
N1080
N1081
N1694
N1695
N2614
N2617
N2648
N2655
N2664
N2692

Eleven methods were used to analyze the environmental samples. Samples were collected and shipped via overnight carrier to the laboratory. Selected samples were analyzed for one or more of the following analytes/methods in Table 3.

Table 3
Analytical Parameters

Parameter	Method
Gasoline Range Organics (GRO)	AK101
Diesel Range Organics (DRO)	AK102
Chloride and Sulfate	E300

Table 3
Analytical Parameters

Parameter	Method
Volatile Fatty Acids	E300.0M
Alkalinity	E310.1
Nitrate+Nitrite	E353.2
Sulfide	E376.2
Dissolved Gases	RSK-175
Iron and Manganese	SW6010B
Volatile Organic Compounds	SW8260C
Total Organic Carbon (TOC)	SW9060

The assessment of data includes a review of: (1) the chain-of-custody (COC) documentation; (2) holding-time compliance; (3) the required quality control (QC) samples at the specified frequencies; (4) method blanks; (5) laboratory control sample/laboratory control sample duplicates (LCS/LCSD); (6) surrogate spike recoveries; (7) matrix spike/matrix spike duplicate (MS/MSD) samples; and (8) initial and continuing calibration information and other method-specific criteria as defined by the JBER QAPP.

Field samples were also reviewed to ascertain field compliance and data quality issues. This included a review of FDs, EBs and TBs.

Data flags were assigned according to the JBER QAPP. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will be only one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

The data flags are defined below:

- J = The analyte was positively identified, and the quantitation is an estimation because of discrepancies in meeting certain analyte-specific quality control criteria. Or the analyte was positively identified, but the associated concentration is estimated above the method detection limit and below the limit of quantitation (LOQ).

- R = The data are rejected because of deficiencies in meeting QC criteria and may not be used for decision making.

- B = The analyte was detected in the sample at a concentration less than or equal to five times (10 times for common laboratory contaminants) the blank concentration.

- U = The analyte was analyzed for, but the analyte was not detected.

- UJ = The analyte was not detected; however, the result is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

Findings

The overall summaries of the data validation findings are contained in the following sections and Table 4.

Also included as documentation of data validation findings is the Alaska Department of Environmental Conservation Laboratory Data Review Checklist (Version 2.7, January 2010). A checklist is provided for each laboratory SDG and can be found in Appendix B to this DQE.

Holding Times

All holding-time criteria were met.

Calibration

All initial and continuing calibration criteria were met with one exception.

The recovery of bromoform was greater than JBER QAPP criteria in a continuing calibration verification for Method SW8260C lot WB1-0421. All associated samples were not detected for bromoform and no data were qualified.

Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination with the following exceptions:

GRO was detected below the LOQ in a method blank for Method AK101 lot WB2-0917. One associated sample result detected less than five times the blank concentration was qualified as estimated and flagged "B".

Methane was detected below the LOQ in the method blanks for Method RSK-175 lots XB1-0421, XB1-0909, XB1-0912, XB1-0915, XB1-0922, XB1-1022 and XB1-1023. Sixteen associated sample results detected less than five times the blank concentrations were qualified as estimated and flagged "B". Sixteen associated results detected greater than five times the blank concentrations were not qualified.

Hexachlorobutadiene was detected below the LOQ in the method blanks for Method SW8260C lots WB1-0909, WB1-0912, WB1-0915, WB1-0919, WB1-1022, WB1-1023 and WB1-1024. Twenty-nine associated nondetected results were not qualified.

Calibration Blanks

Lactic acid was detected below and above the LOQ in the continuing calibration blanks (CCB) for Method E300.0M lot 091914J1VF. One associated result detected greater than five times the blank concentrations, and 16 associated nondetected results, were not qualified.

TOC was detected below the LOQ in a CCB for Method SW9060 lot 042314TOCW. Three associated results detected greater than five times the blank concentration were not qualified.

Trip Blanks

Thirteen TBs were collected and were free of contamination with the following exceptions:

GRO was detected below the LOQ in TB 14Q3DA089-GWTB03 for Method AK101. One associated sample result detected less than five times the blank concentration was qualified as estimated and flagged "B".

Methane was detected below the LOQ in TBs 14Q2DA085-TB01-SO-0, 13Q4CG039-TB01-GW-0 and 13Q4DA085-GWTB01 for Method RSK-175. Three associated sample results detected less than five times the blank concentrations were qualified as estimated and flagged "B". Eight associated results detected greater than five times the blank concentrations were not qualified.

Acetone was detected below the LOQ in TB 14Q3CG039-GWTB02 for Method SW8260C. Four associated nondetected results were not qualified.

Equipment Blanks

Four EBs were collected and were free of contamination with the exceptions listed below. EBs were not collected in the January and April 2014 events.

GRO was detected below the LOQ in EB 14Q3DA089-GWEB01 for Method AK101. One associated sample result detected less than five times the blank concentration was qualified as estimated and flagged "B".

Sulfate and chloride were detected above the LOQ in EBs 13Q4CG039-GWEB01 and 13Q4DA085-EB01-GW-0 for Method E300.0. Three associated sample results detected less than five times the blank concentrations were qualified as estimated and flagged "B". One associated sample result detected greater than five times the blank concentrations, and six associated nondetected results, were not qualified.

Nitrate+nitrite was detected above the LOQ in EBs 14Q3DA089-GWEB01, 14Q3CG039-GWEB01, 13Q4CG039-GWEB01 and 13Q4DA085-EB01-GW-0 for Method E353.2. Five associated sample results detected less than five times the blank concentrations were qualified as estimated and flagged "B". Twenty-one associated sample results detected greater than five times the blank concentrations, and one associated nondetected result, were not qualified.

Sulfide was detected above the LOQ in EB 13Q4DA085-EB01-GW-0 for Method E376.2. One associated sample result detected less than five times the blank concentration was qualified as estimated and flagged "B". One associated nondetected result was not qualified.

Methane was detected below the LOQ in EBs 14Q3DA089-GWEB01, 14Q3CG039-GWEB01, 13Q4CG039-GWEB01 and 13Q4DA085-EB01-GW-0 for Method RSK-175. Fifteen associated sample results detected less than five times the blank concentration were qualified as estimated and flagged "B". Twelve associated sample results detected greater than five times the blank concentrations were not qualified.

Dissolved manganese and dissolved iron were detected below and/or above the LOQ in EBs 14Q3DA089-GWEB01, 14Q3CG039-GWEB01, 13Q4CG039-GWEB01 and 13Q4DA085-EB01-GW-0 for Method SW6010B/C. Nine associated sample results detected less than five times the blank concentrations were qualified as estimated and flagged "B". Seventeen associated sample results detected greater than five times the blank concentrations, and three associated nondetected results, were not qualified.

Acetone, chloromethane, ethylbenzene, m,p-xylene, o-xylene, tetrachloroethene, total xylenes and toluene were detected below or above the LOQ in EBs 14Q3DA089-GWEB01, 14Q3CG039-

GWEB01, 13Q4CG039-GWEB01 and 13Q4DA085-EB01-GW-0 for Method SW8260C. Two associated sample results detected less than five times (10 times for acetone) the blank concentrations were qualified as estimated and flagged "B". Five associated sample results detected greater than five times (10 times for acetone) the blank concentrations, and 122 associated nondetected results, were not qualified.

TOC was detected above and below the LOQ in EBs 14Q3DA089-GWEB01, 14Q3CG039-GWEB01 and 13Q4DA085-EB01-GW-0 for Method SW9060. Four associated sample results detected less than five times the blank concentrations were qualified as estimated and flagged "B". Six associated sample results detected greater than five times the blank concentrations were not qualified.

Field Duplicates

Six FD sets were collected. Precision was acceptable with the following exceptions:

The relative percent differences (RPD) of 1,1-dichloroethene and chloroform were greater than JBER QAPP criteria in FD set 13Q4CG039-AP4550-GW-0/13Q4CG039-AP4550-GW-1 for Method SW8260C. Two associated detected results were qualified as estimated and flagged "J"; two associated nondetected results were qualified as estimated and flagged "UJ".

The RPDs of chloride and sulfate were greater than JBER QAPP criteria in FD set 13Q4DA085-AP4413-GW-0/13Q4DA085-AP4413-GW-1 for Method E300.0. Three associated detected results were qualified as estimated and flagged "J"; one associated nondetected result was qualified as estimated and flagged "UJ".

The RPD of sulfide was greater than JBER QAPP criteria in FD set 13Q4DA085-AP4413-GW-0/13Q4DA085-AP4413-GW-1 for Method E376.2. One associated detected result was qualified as estimated and flagged "J"; one associated nondetected result was qualified as estimated and flagged "UJ".

Matrix Spike Samples

The results of MS/MSD analyses provide information about the possible influence of the matrix on either accuracy or precision of the measurements. The field crew designated samples for MS/MSD analysis. All acceptance criteria were met with the following exceptions:

The recovery dissolved iron was outside of JBER QAPP criteria in the MSs and or MSDs of samples 14Q3CG039-AP4550-GW-0, 14Q2CG039-AP4550-GW-0 and 14Q1CG039-AP3983R-GW-0 for Method SW6010B/C. The associated detected results were not qualified because the sample concentrations were greater than four times the spike concentrations.

The recoveries of 1,1,2,2-tetrachloroethane and cis-1,2-dichloroethene were less than JBER QAPP criteria in the MS and MSD of sample 14Q3CG039-AP4550-GW-0 for Method SW8260C. The associated detected results were not qualified because the sample concentrations were greater than four times the spike concentrations.

The recovery of trichloroethene was less than JBER QAPP criteria in the MSD of sample 14Q3CG039-AP4550-GW-0 for Method SW8260C. The associated detected result was qualified as estimated and flagged "J".

The RPD of chloroethane was greater than JBER QAPP criteria in the MS/MSD set of sample 14Q3DA089-AP4413-GW-0 for Method SW8260C. The associated nondetected result was not qualified.

The recoveries of cis-1,2-dichloroethene, trichloroethene and 1,1,2,2-tetrachloroethane were outside of JBER QAPP criteria in the MS and MSD of sample 14Q1CG039-AP3983R-GW-0 for Method SW8260C. The associated detected results were not qualified because the sample concentrations were greater than four times the spike concentrations.

The recovery of tetrachloroethene was greater than JBER QAPP criteria in the MS of sample 13Q4DA085-AP4413-GW-0 for Method SW8260C. The associated detected result was qualified as estimated and flagged "J".

The recovery of hexachlorobutadiene was greater than JBER QAPP criteria in the MS and MSD of sample 13Q4DA085-AP4413-GW-0 for Method SW8260C. The associated nondetected result was not qualified.

The recovery of TOC was greater than JBER QAPP criteria in the MSD of sample 14Q1CG039-AP3983R-GW-0 for Method SW9060. The associated detected result was not qualified because the sample concentration was greater than four times the spike concentration.

The recovery of TOC was greater than JBER QAPP criteria in the MS and MSD of sample 13Q4DA085-AP4413-GW-0 for Method SW9060. The associated detected result was qualified as estimated and flagged "J".

Surrogates

Surrogates were added to all samples for the methods requiring their use. Surrogate recoveries met criteria.

Laboratory Control Samples

LCS/LCSDs were analyzed and all accuracy and precision criteria were met with the following exception:

The recovery of chloroethane was greater than JBER QAPP criteria in a LCS for Method SW8260C lot WB1-0919. The associated nondetected results were not qualified.

Internal Standards

All internal standard acceptance criteria were met.

Tentatively Identified Compounds

Tentatively identified compounds were not reported.

Chain of Custody and Sample Receipt Discrepancies

SDG M3042

No discrepancies noted.

SDG M3043

No discrepancies noted.

SDG N1080

The chain of custody requested Method E376.1 for sulfide; samples analyzed by equivalent method E376.2.

SDG N1081

The chain of custody requested Method E376.1 for sulfide; samples analyzed by equivalent method E376.2.

SDG N1694

The chain of custody was not relinquished.

SDG N1695

The chain of custody was not relinquished.

The chain of custody requested Method E376.1 for sulfide; samples analyzed by equivalent method E376.2.

SDG N2614

No discrepancies noted.

SDG N2617

No discrepancies noted.

SDG N2648

No discrepancies noted.

SDG N2655

No discrepancies noted.

SDG N2664

No discrepancies noted.

SDG N2692

The containers for SW6010B for sample 14Q3DA089-AP4413-GW-1 and E353.2 for sample 14Q3DA089-AP4413-GW-0 were received frozen. The associated data were qualified as estimated and flagged "J".

Overall Assessment

The final activity in the data quality evaluation is an assessment of whether the data meet the data quality objectives. The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the resulting analytical data can be used to support the decision making process. The precision, accuracy, representativeness, completeness and comparability are addressed in the JBER QAPP. The following summary highlights the data evaluation findings for the above defined events:

1. No data were rejected and completeness was 100 percent for all method/matrix/analyte combinations.
2. One hundred percent of the AK101 data were qualified due to low-level detections in the laboratory blank, TBs and EBs. The degree to which blank contamination was observed is within reasonable method expectations considering the small size of the dataset.
3. Approximately five percent of the E300.0 data, and five percent of the E376.2 data, were qualified due to low-level detections in the EBs. The degree to which blank contamination was observed is within reasonable method expectations considering the small size of the dataset.
4. Approximately nine percent of the E353.2 data were qualified due to low-level detections in the EBs. The degree to which blank contamination was observed suggests a contamination issue during sample collection.
5. Approximately 16 percent of the RSK-175 data were qualified due to low-level detections in the laboratory blanks, TBs and EBs. The degree to which blank contamination was observed suggests a contamination issue at the laboratory and/or during sample collection.
6. Approximately 11 percent of the SW6010B data were qualified due to low-level detections in the EBs. The degree to which blank contamination was observed suggests a contamination issue during sample collection.
7. Less than one percent of the SW8260C data were qualified due to low-level detections in the EBs. The degree to which blank contamination was observed is within reasonable method expectations.
8. Approximately 18 percent of the SW9060 data were qualified due to low-level detections in the EBs. The degree to which blank contamination was observed suggests a contamination issue during sample collection.
9. Two sample containers were received frozen; three results were qualified as estimated.
10. FD RPD exceedances were observed for Methods E300.0, E376.2 and SW8260C; 11 results were qualified as estimated.
11. MS/MSD recovery exceedances were observed for Methods SW9060 and SW8260C; three results were qualified as estimated.
12. Although data were qualified as estimated due to QC exceedances as noted, overall precision and accuracy of the data, as measured by field and laboratory QC indicators suggest that data are usable for projects objectives.

Table 4 – Validation Flags

NativeID	Method	Analyte	Final Result	Units	Final Flag	Reason	Comment
13Q4CG039-AP3983R-GW-0	SW8260C	Acetone	7.58	µg/L	B	EB<LOQ	blank target = 0.83UG/L
13Q4CG039-AP4550-GW-0	SW8260C	1,1-DCE	1.94	µg/L	J	FD>RPD	RPD 64% vs 30%
13Q4CG039-AP4550-GW-0	SW8260C	Chloroform	3.02	µg/L	J	FD>RPD	RPD 120% vs 30%
13Q4CG039-AP4550-GW-1	SW8260C	1,1-DCE	1.25	µg/L	UJ	FD>RPD	RPD 64% vs 30%
13Q4CG039-AP4550-GW-1	SW8260C	Chloroform	1.25	µg/L	UJ	FD>RPD	RPD 120% vs 30%
13Q4CG039-AP4551-GW-0	E353.2	Nitrate/Nitrite-N	0.0302	mg/L	B	EB<LOQ	blank target = 0.0061MG/L
13Q4CG039-AP4551-GW-0	RSK-175	Methane	0.364	µg/L	B	TB<LOQ	blank target = 0.223UG/L
13Q4DA085-AP4413-GW-0	E300.0	Chloride	38.9	mg/L	B	FD>RPD	RPD 199% vs 30%
13Q4DA085-AP4413-GW-0	E300.0	Chloride	38.9	mg/L	B	EB>LOQ	blank target = 40.1MG/L
13Q4DA085-AP4413-GW-0	E300.0	Sulfate	21.8	mg/L	B	EB>LOQ	blank target = 22.1MG/L
13Q4DA085-AP4413-GW-0	E300.0	Sulfate	21.8	mg/L	B	FD>RPD	RPD = 137% vs 30%
13Q4DA085-AP4413-GW-0	E353.2	Nitrate/Nitrite-N	0.0195	mg/L	B	EB>LOQ	blank target = 0.0178MG/L
13Q4DA085-AP4413-GW-0	E376.2	Sulfide	0.241	mg/L	B	FD>RPD	RPD = 177% vs 30%
13Q4DA085-AP4413-GW-0	E376.2	Sulfide	0.241	mg/L	B	EB>LOQ	blank target = 0.22MG/L
13Q4DA085-AP4413-GW-0	RSK-175	Methane	0.0417	µg/L	B	EB<LOQ	blank target = 0.0527UG/L
13Q4DA085-AP4413-GW-0	RSK-175	Methane	0.0417	µg/L	B	LB<LOQ	blank target = 0.0678UG/L
13Q4DA085-AP4413-GW-0	RSK-175	Methane	0.0417	µg/L	B	TB<LOQ	blank target = 0.0994UG/L
13Q4DA085-AP4413-GW-0	SW6010B	Manganese, dissolved	543	µg/L	B	EB>LOQ	blank target = 545UG/L
13Q4DA085-AP4413-GW-0	SW8260C	Tetrachloroethylene	125	µg/L	J	MS>UCL	%R = 207 LCL=45 UCL=150
13Q4DA085-AP4413-GW-0	SW9060	Total Organic Carbon	1.34	mg/L	B	MS>UCL	%R = 252 LCL=75 UCL=125
13Q4DA085-AP4413-GW-0	SW9060	Total Organic Carbon	1.34	mg/L	B	SD>UCL	%R = 265 LCL=75 UCL=125
13Q4DA085-AP4413-GW-0	SW9060	Total Organic Carbon	1.34	mg/L	B	EB>LOQ	blank target = 0.697MG/L
13Q4DA085-AP4413-GW-1	E300.0	Chloride	0.05	mg/L	UJ	FD>RPD	RPD 199% vs 30%
13Q4DA085-AP4413-GW-1	E300.0	Sulfate	4.09	mg/L	B	EB>LOQ	blank target = 22.1MG/L
13Q4DA085-AP4413-GW-1	E300.0	Sulfate	4.09	mg/L	B	FD>RPD	RPD = 137% vs 30%
13Q4DA085-AP4413-GW-1	E353.2	Nitrate/Nitrite-N	0.0223	mg/L	B	EB>LOQ	blank target = 0.0178MG/L
13Q4DA085-AP4413-GW-1	E376.2	Sulfide	0.015	mg/L	UJ	FD>RPD	RPD = 177% vs 30%
13Q4DA085-AP4413-GW-1	RSK-175	Methane	0.0436	µg/L	B	TB<LOQ	blank target = 0.0994UG/L
13Q4DA085-AP4413-GW-1	RSK-175	Methane	0.0436	µg/L	B	LB<LOQ	blank target = 0.143UG/L
13Q4DA085-AP4413-GW-1	RSK-175	Methane	0.0436	µg/L	B	EB<LOQ	blank target = 0.0527UG/L

NativeID	Method	Analyte	Final Result	Units	Final Flag	Reason	Comment
13Q4DA085-AP4413-GW-1	SW6010B	Manganese, dissolved	1.26	µg/L	B	EB>LOQ	blank target = 545UG/L
13Q4DA085-AP4413-GW-1	SW9060	Total Organic Carbon	1.25	mg/L	B	EB>LOQ	blank target = 0.697MG/L
14Q2DA085-AP4413-GW-0	RSK-175	Methane	0.198	µg/L	B	LB<LOQ	blank target = 0.0781UG/L
14Q2DA085-AP4413-GW-1	RSK-175	Methane	0.218	µg/L	B	LB<LOQ	blank target = 0.0781UG/L
14Q3CG039-AP3744-GW-0	RSK-175	Methane	0.104	µg/L	B	EB<LOQ	blank target = 0.133UG/L
14Q3CG039-AP3744-GW-0	RSK-175	Methane	0.104	µg/L	B	LB<LOQ	blank target = 0.0743UG/L
14Q3CG039-AP3744-GW-0	SW9060	Total Organic Carbon	1.01	mg/L	B	EB<LOQ	blank target = 0.256MG/L
14Q3CG039-AP3747-GW-0	RSK-175	Methane	0.0961	µg/L	B	EB<LOQ	blank target = 0.133UG/L
14Q3CG039-AP3747-GW-0	RSK-175	Methane	0.0961	µg/L	B	LB<LOQ	blank target = 0.0919UG/L
14Q3CG039-AP3747-GW-0	SW6010B	Manganese, dissolved	0.000529	mg/L	B	EB<LOQ	blank target = 0.634UG/L
14Q3CG039-AP3747-GW-0	SW9060	Total Organic Carbon	0.859	mg/L	B	EB<LOQ	blank target = 0.256MG/L
14Q3CG039-AP3748-GW-0	RSK-175	Methane	0.0662	µg/L	B	LB<LOQ	blank target = 0.0919UG/L
14Q3CG039-AP3748-GW-0	RSK-175	Methane	0.0662	µg/L	B	EB<LOQ	blank target = 0.133UG/L
14Q3CG039-AP3983R-GW-0	SW8260C	Acetone	4.21	µg/L	B	EB<LOQ	blank target = 1.14UG/L
14Q3CG039-AP4344-GW-0	RSK-175	Methane	0.0356	µg/L	B	LB<LOQ	blank target = 0.0919UG/L
14Q3CG039-AP4344-GW-0	RSK-175	Methane	0.0356	µg/L	B	EB<LOQ	blank target = 0.133UG/L
14Q3CG039-AP4550-GW-0	SW8260C	Trichloroethene (TCE)	10.2	µg/L	J	SD<LCL	%R = 69 LCL=70 UCL=125
14Q3CG039-AP5246-GW-0	RSK-175	Methane	0.0607	µg/L	B	EB<LOQ	blank target = 0.133UG/L
14Q3CG039-AP5246-GW-0	SW6010B	Manganese, dissolved	0.00112	mg/L	B	EB<LOQ	blank target = 0.634UG/L
14Q3CG039-AP5683-GW-0	RSK-175	Methane	0.0915	µg/L	B	EB<LOQ	blank target = 0.133UG/L
14Q3CG039-AP5683-GW-0	SW6010B	Manganese, dissolved	0.00067	mg/L	B	EB<LOQ	blank target = 0.634UG/L
14Q3DA089-AP3468-GW-0	RSK-175	Methane	0.054	µg/L	B	LB<LOQ	blank target = 0.0876UG/L
14Q3DA089-AP3468-GW-0	RSK-175	Methane	0.054	µg/L	B	EB<LOQ	blank target = 0.0884UG/L
14Q3DA089-AP3468-GW-0	SW6010B	Manganese, dissolved	0.00311	mg/L	B	EB<LOQ	blank target = 0.000772MG/L
14Q3DA089-AP3534-GW-0	RSK-175	Methane	0.0599	µg/L	B	EB<LOQ	blank target = 0.0884UG/L
14Q3DA089-AP3534-GW-0	RSK-175	Methane	0.0599	µg/L	B	LB<LOQ	blank target = 0.0876UG/L
14Q3DA089-AP3774-GW-0	RSK-175	Methane	0.111	µg/L	B	EB<LOQ	blank target = 0.0884UG/L
14Q3DA089-AP3774-GW-0	RSK-175	Methane	0.111	µg/L	B	LB<LOQ	blank target = 0.0876UG/L
14Q3DA089-AP3774-GW-0	SW6010B	Manganese, dissolved	0.00082	mg/L	B	EB<LOQ	blank target = 0.000772MG/L
14Q3DA089-AP3871-GW-0	RSK-175	Methane	0.177	µg/L	B	LB<LOQ	blank target = 0.0743UG/L
14Q3DA089-AP3893-GW-0	RSK-175	Methane	0.229	µg/L	B	LB<LOQ	blank target = 0.136UG/L
14Q3DA089-AP3893-GW-0	RSK-175	Methane	0.229	µg/L	B	EB<LOQ	blank target = 0.0884UG/L

NativeID	Method	Analyte	Final Result	Units	Final Flag	Reason	Comment
14Q3DA089-AP4341-GW-0	AK101	TPH-Gasoline	52.1	µg/L	B	EB<LOQ	blank target = 34.3UG/L
14Q3DA089-AP4341-GW-0	AK101	TPH-Gasoline	52.1	µg/L	B	TB<LOQ	blank target = 48.6UG/L
14Q3DA089-AP4341-GW-0	AK101	TPH-Gasoline	52.1	µg/L	B	LB<LOQ	blank target = 32.3UG/L
14Q3DA089-AP4341-GW-0	RSK-175	Methane	0.0425	µg/L	B	EB<LOQ	blank target = 0.0884UG/L
14Q3DA089-AP4341-GW-0	RSK-175	Methane	0.0425	µg/L	B	LB<LOQ	blank target = 0.136UG/L
14Q3DA089-AP4341-GW-0	SW6010B	Manganese, dissolved	0.00134	mg/L	B	EB<LOQ	blank target = 0.000772MG/L
14Q3DA089-AP4411-GW-0	RSK-175	Methane	0.122	µg/L	B	EB<LOQ	blank target = 0.0884UG/L
14Q3DA089-AP4411-GW-0	RSK-175	Methane	0.122	µg/L	B	LB<LOQ	blank target = 0.136UG/L
14Q3DA089-AP4411-GW-0	SW6010B	Manganese, dissolved	0.00122	mg/L	B	EB<LOQ	blank target = 0.000772MG/L
14Q3DA089-AP4413-GW-0	E353.2	Nitrate/Nitrite-N	0.0375	mg/L	B	FROZEN	Received frozen
14Q3DA089-AP4413-GW-0	E353.2	Nitrate/Nitrite-N	0.0375	mg/L	B	EB>LOQ	blank target = 0.0337MG/L
14Q3DA089-AP4413-GW-0	RSK-175	Methane	0.0454	µg/L	B	EB<LOQ	blank target = 0.0884UG/L
14Q3DA089-AP4413-GW-0	RSK-175	Methane	0.0454	µg/L	B	LB<LOQ	blank target = 0.136UG/L
14Q3DA089-AP4413-GW-1	E353.2	Nitrate/Nitrite-N	0.0386	mg/L	B	EB>LOQ	blank target = 0.0337MG/L
14Q3DA089-AP4413-GW-1	SW6010B	Iron, dissolved	4.22	mg/L	J	FROZEN	Received frozen
14Q3DA089-AP4413-GW-1	SW6010B	Manganese, dissolved	9.98	mg/L	J	FROZEN	Received frozen

Notes:
mg/L = milligrams per liter
µg/L = micrograms per liter
EB<LOQ = Equipment blank concentration less than the limit of quantitation
EB>LOQ = Equipment blank concentration greater than the limit of quantitation
FD>RPD = Field duplicate relative percent difference criterion exceeded
FROZEN = Sample received frozen
LB<LOQ = Laboratory blank concentration less than the limit of quantitation
MS>UCL = Matrix spike recovery greater than the upper control limit
SD<LCL = Matrix spike duplicate recovery less than the lower control limit
SD>UCL = Matrix spike duplicate recovery greater than the upper control limit
TB<LOQ = Equipment blank concentration less than the limit of quantitation

Appendix A – Samples Associated with DQE

Sample ID	Sample Type	Sample Date	TB Associations	EB Associations
13Q4CG039-GWEB01	EB	10/16/2013		16101301
13Q4DA085-EB01-GW-0	EB	10/16/2013		16101302
14Q3CG039-GWEB01	EB	9/10/2014		10091401
14Q3DA089-GWEB01	EB	9/15/2014		15091401
13Q4CG039-AP4550-GW-1	FD	10/15/2013	16101301	16101301
13Q4DA085-AP4413-GW-1	FD	10/16/2013	16101302	16101302
14Q1CG039-AP4550-GW-1	FD	1/16/2014	16011401	noEB
14Q2DA085-AP4413-GW-1	FD	4/14/2014	15041401	noEB
14Q3CG039-AP4550-GW-1	FD	9/9/2014	09091401	10091401
14Q3DA089-AP4413-GW-1	FD	9/15/2014	15091401	15091401
13Q4CG039-AP4550-GW-0	N	10/15/2013	16101301	16101301
13Q4CG039-AP3983R-GW-0	N	10/16/2013	16101301	16101301
13Q4CG039-AP4551-GW-0	N	10/16/2013	16101301	16101301
13Q4DA085-AP4413-GW-0	N	10/16/2013	16101302	16101302
14Q1DA085-AP4413-GW-0	N	1/14/2014	14011401	noEB
14Q1CG039-AP3983R-GW-0	N	1/16/2014	16011401	noEB
14Q1CG039-AP4550-GW-0	N	1/16/2014	16011401	noEB
14Q1CG039-AP4551-GW-0	N	1/16/2014	16011401	noEB
14Q2DA085-AP4413-GW-0	N	4/14/2014	15041401	noEB
14Q2CG039-AP3983R-GW-0	N	4/15/2014	15041401	noEB
14Q2CG039-AP4550-GW-0	N	4/15/2014	15041401	noEB
14Q2CG039-AP4551-GW-0	N	4/15/2014	15041401	noEB
14Q3CG039-AP5246-GW-0	N	9/4/2014	04091401	10091401
14Q3CG039-AP5683-GW-0	N	9/4/2014	04091401	10091401
14Q3CG039-AP3747-GW-0	N	9/5/2014	05091401	10091401
14Q3CG039-AP3748-GW-0	N	9/5/2014	05091401	10091401
14Q3CG039-AP4344-GW-0	N	9/5/2014	05091401	10091401
14Q3CG039-AP4353-GW-0	N	9/5/2014	05091401	10091401
14Q3DA089-AP3870-GW-0	N	9/8/2014	08091401	15091401
14Q3DA089-AP3871-GW-0	N	9/8/2014	08091401	15091401
14Q3CG039-AP3744-GW-0	N	9/9/2014	09091401	10091401
14Q3CG039-AP3983R-GW-0	N	9/9/2014	09091401	10091401
14Q3CG039-AP3989-GW-0	N	9/9/2014	09091401	10091401
14Q3CG039-AP4550-GW-0	N	9/9/2014	09091401	10091401
14Q3CG039-AP4551-GW-0	N	9/10/2014	10091401	10091401
14Q3DA089-AP3468-GW-0	N	9/11/2014	11091401	15091401
14Q3DA089-AP3534-GW-0	N	9/11/2014	11091401	15091401
14Q3DA089-AP3774-GW-0	N	9/11/2014	11091401	15091401
14Q3DA089-AP3893-GW-0	N	9/12/2014	12091401	15091401
14Q3DA089-AP4341-GW-0	N	9/12/2014	12091401	15091401
14Q3DA089-AP4411-GW-0	N	9/12/2014	12091401	15091401

Sample ID	Sample Type	Sample Date	TB Associations	EB Associations
14Q3DA089-AP4342-GW-0	N	9/15/2014	15091401	15091401
14Q3DA089-AP4413-GW-0	N	9/15/2014	15091401	15091401
13Q4CG039-TB01-GW-0	TB	10/16/2013	16101301	
13Q4DA085-GWTB01	TB	10/16/2013	16101302	
14Q1DA085-GWTB01	TB	1/14/2014	14011401	
14Q1CG039-GWTB01	TB	1/16/2014	16011401	
14Q2DA085-TB01-SO-0	TB	4/15/2014	15041401	
14Q3CG039-GWTB01	TB	9/4/2014	04091401	
14Q3CG039-GWTB02	TB	9/5/2014	05091401	
14Q3DA089-GWTB01	TB	9/8/2014	08091401	
14Q3CG039-GWTB03	TB	9/9/2014	09091401	
14Q3CG039-GWTB04	TB	9/10/2014	10091401	
14Q3DA089-GWTB02	TB	9/11/2014	11091401	
14Q3DA089-GWTB03	TB	9/12/2014	12091401	
14Q3DA089-GWTB04	TB	9/15/2014	15091401	

Notes:
EB = equipment blank
FD= field duplicate
N = primary sample
TB = trip blank

ADEC Laboratory Data Review Checklists

Laboratory Data Review Checklist

CompletedBy	Jamie Beckett		
Title	Chemist	Date	Dec 31, 2013
CS Report Name		ReportDate	Dec 03, 2013
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	M3042
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

2.6C

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
FD RPD exceedances.
Target analytes detected in the EB and method blank.
RSK-175:
Target analytes detected in the EB, TB and method blank.
SW6010B:
Target analytes detected in the EB.
E300.0:
Target analtyes detected in the EB.
E353.2:
Nitrate detected in the EB.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Some data qualified as estimated;usable as qualified.

5. Samples 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:

No soil samples reported.

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:

For details, see site-specific report.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: Methane for RSK-175.

These analytes had Method Blank detects: Hexachlorobutadiene for SW8260C.

iii. If above PQL, what samples are affected?

Comments:

No samples affected

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).
Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Trip Blank detects: Methane for RSK-175.

iv. If above PQL, what samples are affected?

Comments:

13Q4CG039-AP4551-GW-0

v. Data quality or usability affected? (Please explain.)

Comments:

Associated sample results less than five times the blank concentration were flagged "B". Associated results detected greater than five times the blank concentration were not qualified.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

○ Yes ◉ No ○ NA (Please explain.) Comments:

These samples were out of control for SW8260C: 1,1-DCE (13Q4CG039-AP4550-GW-0/13Q4CG039-AP4550-GW-1, RPD 43 vs 30), Chloroform (13Q4CG039-AP4550-GW-0/13Q4CG039-AP4550-GW-1,

RPD 83 vs 30), associated sample results were flagged J and UJ.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

Data qualified as estimated; usable as qualified.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: Chloride, Sulfate for E300.

These analytes had Equipment Blank detects: Nitrate/Nitrite-N for E353.2.

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Iron, dissolved, Manganese, dissolved for SW6010B.

These analytes had Equipment Blank detects: Acetone, Chloromethane for SW8260C.

ii. If above PQL, what samples are affected?

13Q4CG039-AP3983R-GW-0, 13Q4CG039-AP4551-GW-0

iii. Data quality or usability affected? (Please explain.)

Associated sample results less than five times (10 times for acetone) the blank concentration were flagged "B". Associated results detected greater than five times (10 times for acetone) the blank concentration were not qualified.

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

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No other flags applied.

Laboratory Data Review Checklist

CompletedBy	Jamie Beckett		
Title	Chemist	Date	Dec 31, 2013
CS Report Name		ReportDate	Dec 03, 2013
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	M3043
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

4.2C

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
On analysis day 10/22/13, matrix spike/spike duplicate analysis in analytical batch 102213E1 was performed on JBER sample 13Q4TU073-SB1105-SO-1ST (M302109MS/M302110MSD).
Some compounds did not meet percent recovery acceptance criteria.
SW9060:
Matrix Spike/Matrix Spike Duplicate(s):
SW9060: MS recovery of Total Organic Carbon(252%) in 13Q4DA085-AP4413-GW-0MS did not meet acceptance criteria of 85-115%.
MSD recovery of Total Organic Carbon(265%) in 13Q4DA085-AP4413-GW-0SD did not meet acceptance criteria of 85-115%.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Some data qualified as estimated; usable as qualified.

5. Samples 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:

No soil samples reported.

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:

For details, see site-specific report.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: Methane for RSK-175.

These analytes had Method Blank detects: Hexachlorobutadiene for SW8260C.

iii. If above PQL, what samples are affected?

Comments:

13Q4DA085-AP4413-GW-0, 13Q4DA085-AP4413-GW-1

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample detects less than five times the blank concentration were flagged 'B'. Associated sample detects greater than five times the blank concentration and non-detects were not qualified.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Trip Blank detects: Methane for RSK-175.

iv. If above PQL, what samples are affected?

Comments:

13Q4DA085-AP4413-GW-0, 13Q4DA085-AP4413-GW-1

v. Data quality or usability affected? (Please explain.)

Comments:

Associated sample detects less than five times the blank concentration were flagged 'B'.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

○ Yes ◉ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

○ Yes ◉ No ○ NA (Please explain.) Comments:

These samples were out of control for E300.0: Chloride (13Q4DA085-AP4413-GW-0/3Q4DA085-AP4413-GW-1, %RPD 199.49 vs 30), Sulfate (13Q4DA085-AP4413-GW-0/13Q4DA085-AP4413-GW-1, %RPD = 136.81 vs 30), associated sample results were flagged J and UJ.

These samples were out of control for E376.2: Sulfide (13Q4DA085-AP4413-GW-0/13Q4DA085-AP4413-GW-1, %RPD = 176 vs 30), associated sample results were flagged J and UJ.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

Data qualified as estimated; usable as qualified.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: Chloride, Sulfate for E300.0.

These analytes had Equipment Blank detects: Nitrate/Nitrite-N for E353.2.

These analytes had Equipment Blank detects: Sulfide for E376.2.

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Manganese, dissolved for SW6010B.

These analytes had Equipment Blank detects: Acetone, Tetrachloroethylene for SW8260C.

These analytes had Equipment Blank detects: Total Organic Carbon for SW9060.

ii. If above PQL, what samples are affected?

13Q4DA085-AP4413-GW-0, 13Q4DA085-AP4413-GW-1

iii. Data quality or usability affected? (Please explain.)

Associated sample detects less than five times (10 times for acetone) the blank concentrations were flagged 'B'. Associated sample detects greater than five times (10 times for acetone) the blank concentrations and non-detects were not qualified.

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

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Matrix:

These samples were flagged for Matrix spike duplicate recovery criteria greater than the upper control limit:
Total Organic Carbon (13Q4DA085-AP4413-GW-0, %R = 265 LCL=75 UCL=125) for SW9060.
Data qualified as estimated and detected result flagged J.

Hexachlorobutadiene (13Q4DA085-AP4413-GW-0, %R = 190 LCL=50 UCL=140) for SW8260C. Associated nondetected result was not qualified.

These samples were flagged for Matrix spike recovery greater than the upper control limit:
Hexachlorobutadiene (13Q4DA085-AP4413-GW-0, %R = 183 LCL=50 UCL=140) for SW8260C. Associated nondetected result was not qualified.

Tetrachloroethylene (13Q4DA085-AP4413-GW-0, %R = 207 LCL=45 UCL=150) for SW8260C. Data qualified as estimated and detected result flagged J.

Total Organic Carbon (13Q4DA085-AP4413-GW-0, %R = 252 LCL=75 UCL=125) for SW9060. Data qualified as estimated and detected result flagged J.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/19/2014
CS Report Name		ReportDate	2/18/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N1080
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

COC requested Method E376.1 for sulfide; samples analyzed by equivalent method E376.2.

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Samples received at 5.5C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
Matrix Spike/Matrix Spike Duplicate(s):
Recovery of cis-1,2-Dichloroethene (0%) in 14Q1CG039-AP3983R-GW-0MS did not meet acceptance criteria of 70-125%. Recovery of cis-1,2-Dichloroethene (0%) in 14Q1CG039-AP3983R-GW-0SD did not meet acceptance criteria of 70-125%. Recovery of 1,1,2,2-Tetrachloroethane (137%) in 14Q1CG039-AP3983R-GW-0MS did not meet acceptance criteria of 65-130%. Recovery of 1,1,2,2-Tetrachloroethane (182%) in 14Q1CG039-AP3983R-GW-0SD did not meet acceptance criteria of 65-130%.
Surrogate Standard(s):
Analytical Exception(s):
Due to high levels of analytes in the native samples, matrix spike/spike duplicate analysis in batch 012214P1 could not be performed on a JBER sample. Another client sample was selected and acceptance criteria were met.
SW6010B:
Matrix Spike/Matrix Spike Duplicate(s):
SW6010C: MS and MSD recovery of Iron in 14Q1CG039-AP3983R-GW-0MS and 14Q1CG039-AP3983R-GW-0SD did not meet acceptance criteria of 80-120% because the concentration of Iron in the sample was significantly higher than the added spike concentration.
SW9060:
Matrix Spike/Matrix Spike Duplicate(s):
SW9060A: MSD recovery of Total Organic Carbon(287%) in 14Q1CG039-AP3983R-GW-0SD did not meet acceptance criteria of 80-120%.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No data affected.

v. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).
Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

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

All data are usable as reported.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain.) Comments:

Equipment blank not reported in this SDG.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

iii. Data quality or usability affected? (Please explain.)

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

a. Defined and appropriate?

○ Yes ◉ No ○ NA (Please explain.) Comments:

Matrix:

The recoveries of cis-1,2-dichloroethene, trichloroethene and 1,1,2,2-tetrachloroethane were outside of criteria in the MS and MSD of sample 14Q1CG039-AP3983R-GW-0 for Method SW8260C. The associated detected results were not qualified because concentrations were greater than four times the spike concentrations.

The recovery of dissolved iron was outside of criteria in the MS and MSD of sample 14Q1CG039-AP3983R-GW-0 for Method SW6010B. The associated detected result was not qualified because the concentration was greater than four times the spike concentration.

The recovery of total organic carbon was outside of criteria in the MSD of sample 14Q1CG039-AP3983R-GW-0 for Method SW9060. The associated detected result was not qualified because the concentration was greater than four times the spike concentration.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/19/2014
CS Report Name		ReportDate	2/18/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N1081
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

COC requested sulfide by Method E376.1; samples were analyzed by equivalent method E376.2.

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Samples received at 4.7C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
Due to high levels of analytes in the native samples, matrix spike/spike duplicate analysis in batch 012214P1 could not be performed on a JBER sample. Another client sample was selected and acceptance criteria were met.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No data affected.

v. Data quality or usability affected? (Please explain)

Comments:

All data are usable.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).
Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

All data are usable as reported.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain.) Comments:

Equipment blank not reported in this SDG.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

iii. Data quality or usability affected? (Please explain.)

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No other flags applied.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/19/2014
CS Report Name		ReportDate	5/6/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N1694
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

○ Yes ◉ No ○ NA (Please explain.) Comments:

COC not relinquished.

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:

Samples received at 3.8C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
Calibration Verification(s):
The %D for Bromoform (23%) in CV1-0421 exceeded acceptance criteria of 20%.
Matrix Spike/Matrix Spike Duplicate(s):
Due to high levels of compounds in the native sample, 14Q2CG039-AP4550-GW-0, client specified Matrix
Spike and Matrix Spike Duplicate samples could not be analyzed for risk of instrument contamination. MS/MSD analysis was performed on another client sample. All acceptance criteria were met.
SW6010B:
Matrix Spike/Matrix Spike Duplicate(s):
SW6010C: MS recovery of Iron(0%) in 14Q2CG039-AP4550-GW-0MS did not meet acceptance criteria of 80-120%. MSD recovery of Iron(0%) in 14Q2CG039-AP4550-GW-0SD did not meet acceptance criteria of 80-120%.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

Methane was detected in a method blank for Method RSK175.

iii. If above PQL, what samples are affected?

Comments:

No samples affected.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

TB associated to samples in this SDG is in N1695.

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

Methane was detected in the TB for Method RSK175.

iv. If above PQL, what samples are affected?

Comments:

No samples affected.

v. Data quality or usability affected? (Please explain.)

Comments:

All data are usable as reported.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

ii. Submitted blind to lab?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration

R2 = Field Duplicate Concentration

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No FD in this SDG.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain.) Comments:

Equipment blank not collected.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

iii. Data quality or usability affected? (Please explain.)

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

a. Defined and appropriate?

○ Yes ◉ No ○ NA (Please explain.) Comments:

Calibration:

The recovery of bromoform was greater than criteria in a continuing calibration verification for Method SW8260C. All associated results were not detected and were not qualified.

Total organic carbon was detected in a continuing calibration blank for Method SW9060. Associated detected results were not qualified because concentrations were greater than five times the blank concentration.

Lactic acid was detected in a continuing calibration blank for Method E300.0M. Associated results were not detected and were not qualified.

Matrix:

The recovery of dissolved iron was less than criteria in the MS and MSD of sample 14Q2CG039-AP4550-GW-0 for Method SW6010B. Associated detected results were not qualified because concentrations were greater than four times the spike concentration.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/19/2014
CS Report Name		ReportDate	5/6/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N1695
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

2. Chain of Custody (COC)

a. COC information completed, signed, and dated (including released/received by)?

○ Yes ◉ No ○ NA (Please explain.) Comments:

COC not relinquished.

b. Correct analyses requested?

○ Yes ◉ No ○ NA (Please explain.) Comments:

COC requested sulfide by E376.1; samples were analyzed by equivalent method E376.2.

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Samples received at 3.8C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Sample 14Q2DA085-AP4413-GW-1 was received but not listed on COC. We received 3 VOC vials, 3 MEE vials, 2 TOC vials, 1 metals bottle, 1 nutrient bottle, 1 unpreserved bottle, and 1 sulfide bottle. Samples logged in and analyzed per containers received.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
The %D for Bromoform (23%) in CV1-0421 exceeded acceptance criteria of 20%.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: Methane for RSK-175.

iii. If above PQL, what samples are affected?

Comments:

14Q2DA085-AP4413-GW-0, 14Q2DA085-AP4413-GW-1

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample detects less than five times the blank concentration were flagged 'B'.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).
Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Trip Blank detects: Methane for RSK-175.

iv. If above PQL, what samples are affected?

Comments:

No samples affected.

v. Data quality or usability affected? (Please explain.)

Comments:

All data are usable as reported.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain.) Comments:

Equipment blank not collected.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

iii. Data quality or usability affected? (Please explain.)

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?

○ Yes ◉ No ○ NA (Please explain.) Comments:

Calibration:

The recovery of bromoform was greater than criteria in a continuing calibration verification for Method SW8260C. All associated results were not detected and were not qualified.

Lactic acid was detected in a continuing calibration blank for Method E300.0M. Associated results were not detected and were not qualified.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/5/2014
CS Report Name		ReportDate	9/19/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N2614
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

Samples received at 2.0C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

○ Yes ◉ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ◉ No ○ NA (Please explain.) Comments:

c. Were all corrective actions documented?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No corrective actions.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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?

Comments:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

No data affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Manganese, dissolved for SW6010B.

These analytes had Equipment Blank detects: nitrate/nitrite for E353.2.

These analytes had Equipment Blank detects: Acetone, Ethylbenzene, hexachlorobutadiene, m,p-xylene, o-xylene, Toluene, Total Xylense for SW8260C.

ii. If above PQL, what samples are affected?

14Q3CG039-AP5246-GW-0, 14Q3CG039-AP5683-GW-0

iii. Data quality or usability affected? (Please explain.)

Associated sample results detected less than five times (10 times for acetone) the blank concentrations were qualified as estimated and flagged "B". Associated results detected greater than five times (10 times for acetone) the blank concentrations, and nondetects, were not qualified.

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

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No other flags applied.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/5/2014
CS Report Name		ReportDate	9/24/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N2617
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

Samples received at 1.4C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
On analysis day 9/09/2014, matrix spike/spike duplicate analysis in batch 090914E1 was performed on JBER 14Q3CG039-AP5246-GW-0 (N261401MS/N261401MSD). On analysis day 9/11/2014 (batch 091114E1), a JBER sample was not available for matrix spike/spike duplicate analysis. Another client sample was selected
E300.0M:
E300.0M: Closing Blank (CCB2-0730) contained 0.101 mg/L Lactic Acid. This analyte was non detect in the sample and in the Method Blank (WB1-0919).

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: Methane for RSK-175.

These analytes had Method Blank detects: Hexachlorobutadiene for SW8260C.

These analytes had Method Blank detects: Manganese, dissolved for SW6010B.

iii. If above PQL, what samples are affected?

Comments:

14Q3CG039-AP3747-GW-0, 14Q3CG039-AP3748-GW-0, 14Q3CG039-AP4344-GW-0

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample detects less than five times the blank concentrations were flagged 'B'. Associated sample detects greater than five times the blank concentration and non-detects were not qualified.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).
Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Trip Blank detects: Acetone for SW8260C.

iv. If above PQL, what samples are affected?

Comments:

No samples affected.

v. Data quality or usability affected? (Please explain.)

Comments:

All data are usable as reported.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Manganese, dissolved for SW6010B.

These analytes had Equipment Blank detects: Total Organic Carbon for SW9060.

These analytes had Equipment Blank detects: Nitrate/nitrite for E353.2.

These analytes had Equipment Blank detects: Acetone, Ethylbenzene, m,p-Xylene, o-Xylene, Toluene, Total Xylenes for SW8260C.

ii. If above PQL, what samples are affected?

14Q3CG039-AP3747-GW-0, 14Q3CG039-AP3748-GW-0, 14Q3CG039-AP4344-GW-0

iii. Data quality or usability affected? (Please explain.)

Associated sample results detected less than five times (10 times for acetone) the blank concentrations were qualified as estimated and flagged "B". Associated sample results detected greater than five times (10 times for acetone) the blank concentrations, and nondetects, were not qualified.

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

a. Defined and appropriate?

○ Yes ◉ No ○ NA (Please explain.) Comments:

Lactic acid was detected below the LOQ in a continuing calibration blank for Method E300.0M. No samples were affected.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/5/2014
CS Report Name		ReportDate	9/25/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N2648
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

Samples received at 3.0C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW8260C:
Matrix Spike/Matrix Spike Duplicate(s):
Some compounds did not meet acceptance criteria.
SW6010B:
Matrix Spike/Matrix Spike Duplicate(s):
SW6010C: The matrix spike recovery for iron in client sample "14Q3CG039-AP4550-GW-0MS" was outside acceptance criteria because the analyte concentration in the sample was significantly higher than the added spike concentrations.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: Methane for RSK-175.

These analytes had Method Blank detects: Hexachlorobutadiene for SW8260C.

iii. If above PQL, what samples are affected?

Comments:

14Q3CG039-AP3744-GW-0, 14Q3DA089-AP3871-GW-0

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample detects less than five times the blank concentrations were flagged 'B'. Associated sample detects greater than five times the blank concentration and non-detects were not qualified.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)
Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).
Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

All data are usable as reported.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Acetone, Ethylbenzene, m,p-Xylene, o-Xylene, Toluene, Total Xylenes for SW8260C.

These analytes had Equipment Blank detects: Total Organic Carbon for SW9060.

These analytes had Equipment Blank detects: Nitrate/nitrite for E353.2.

These analytes had Equipment Blank detects: Dissolved Manganese for SW6010B.

ii. If above PQL, what samples are affected?

14Q3CG039-AP3744-GW-0, 14Q3CG039-AP3983R-GW-0,

iii. Data quality or usability affected? (Please explain.)

Associated sample detects less than five times (10 times for acetone) the blank concentrations were flagged 'B'. Associated sample detects greater than five times (10 times for acetone) the blank concentration and non-detects were not qualified.

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

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Calibration:
Lactic acid was detected below the LOQ in a continuing calibration blank for Method E300.0M. No data were affected.

Matrix:

These samples were flagged for Matrix spike duplicate recovery criteria less than the lower control limit: Trichloroethene (TCE) (14Q3CG039-AP4550-GW-0, %R = 69 LCL=70 UCL=125) for SW8260C. Associated detected result was qualified as estimated and flagged "J".

The recovery dissolved iron was less than criteria in the MS of sample 14Q3CG039-AP4550-GW-0 for Method SW6010B. The associated detected result was not qualified because the sample concentration was greater than four times the spike concentration.

The recoveries of 1,1,2,2-tetrachloroethane and cis-1,2-dichloroethene were less than criteria in the MS and MSD of sample 14Q3CG039-AP4550-GW-0 for Method SW8260C. The associated detected results were not qualified because the sample concentrations were greater than four times the spike concentrations.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/5/2014
CS Report Name		ReportDate	9/26/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N2655
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

Samples received at 1.6C

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW6010B:
The native results for iron and manganese in client sample "14Q3DA089-AP3534-GW-0" were less than 50 times the LOQ, so a post digestion spike was performed. All acceptance criteria were met.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: Methane for RSK-175.

These analytes had Method Blank detects: Hexachlorobutadiene for SW8260C.

iii. If above PQL, what samples are affected?

Comments:

14Q3DA089-AP3468-GW-0, 14Q3DA089-AP3534-GW-0, 14Q3DA089-AP3774-GW-0

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample detects less than five times the blank concentrations were flagged 'B'. Associated non-detects were not qualified.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)

Comments:

All data are usable.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

No data affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Manganese, dissolved for SW6010B.

These analytes had Equipment Blank detects: Nitrate/nitrite for E353.2.

These analytes had Equipment Blank detects: Ethylbenzene, m,p-Xylene, o-Xylene, Toluene, Total Xylenes for SW8260C.

ii. If above PQL, what samples are affected?

14Q3DA089-AP3468-GW-0, 14Q3DA089-AP3534-GW-0, 14Q3DA089-AP3774-GW-0

iii. Data quality or usability affected? (Please explain.)

Associated sample detects less than five times the blank concentrations were flagged 'B'. Associated sample results detected greater than five times the blank concentrations and non-detects were not qualified.

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

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No other flags applied.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/5/2014
CS Report Name		ReportDate	11/4/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N2664
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

Samples received at 2.1C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

◉ Yes ○ No ○ NA (Please explain.) Comments:

No discrepancies.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

SW6010B:
The native results for iron and manganese in client sample "14Q3DA089-AP4341-GW-0" were less than 50 times the LOQ, so a post digestion spike was performed. All acceptance criteria were met.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes had Method Blank detects: TPH-Gasoline for AK101.

These analytes had Method Blank detects: Methane for RSK-175.

These analytes had Method Blank detects: Hexachlorobutadiene for SW8260C.

iii. If above PQL, what samples are affected?

Comments:

14Q3DA089-AP3893-GW-0, 14Q3DA089-AP4341-GW-0, 14Q3DA089-AP4411-GW-0

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample detects less than five times the blank concentrations were flagged 'B'. Associated non-detects were not qualified.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Trip Blank detects: TPH-Gasoline for AK101.

iv. If above PQL, what samples are affected?

Comments:

14Q3DA089-AP4341-GW-0

v. Data quality or usability affected? (Please explain.)

Comments:

Associated sample detects less than five times the blank concentrations were flagged 'B'.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes had Equipment Blank detects: TPH-Gasoline for AK101.

These analytes had Equipment Blank detects: Methane for RSK-175.

These analytes had Equipment Blank detects: Manganese, dissolved for SW6010B.

These analytes had Equipment Blank detects: Nitrate/nitrite for E353.2.

These analytes had Equipment Blank detects: Ethylbenzene, m,p-Xylene, o-Xylene, Toluene, Total Xylenes for SW8260C.

ii. If above PQL, what samples are affected?

14Q3DA089-AP3893-GW-0, 14Q3DA089-AP4341-GW-0, 14Q3DA089-AP4411-GW-0

iii. Data quality or usability affected? (Please explain.)

Associated sample detects less than five times the blank concentrations were flagged 'B'. Associated sample results detected greater than five times the blank concentrations and non-detects were not qualified.

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

a. Defined and appropriate?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No other flags applied.

Laboratory Data Review Checklist

CompletedBy	Berney Kidd		
Title	Project Chemist	Date	11/5/2014
CS Report Name		ReportDate	10/7/2014
Consultant Firm	CH2M Hill		
Laboratory Name	Applied Sciences Laboratory	Laboratory Report Number	N2692
ADEC File Number		ADECRecKeyNumber	

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 (Please explain.) Comments:

No samples transferred.

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:

Samples received at 2.4C.

b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

○ Yes ○ No ◉ NA (Please explain.) Comments:

The containers for SW6010B for sample 14Q3DA089-AP4413-GW-1 and E353.2 for sample 14Q3DA089-AP4413-GW-0 were received frozen. The associated data were qualified as estimated and flagged "J".

e. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

4. Case Narrative

a.Present and understandable?

◉ Yes ○ No ○ NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No discrepancies.

c. Were all corrective actions documented?

◉ Yes ○ No ○ NA (Please explain.) Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

All data are usable as reported.

5. Samples 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:

No soil samples reported.

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:

See site-specific report for details.

e. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

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:

These analytes were detected in the method blank: Hexachlorobutadiene for Method SW8260C.

These analytes were detected in the method blank: Methane for RSK175.

iii. If above PQL, what samples are affected?

Comments:

14Q3DA089-AP4413-GW-0

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

◉ Yes ○ No ○ NA (Please explain.) Comments:

Associated sample results less than five times the blank concentrations were qualified as estimated and flagged "B". Associated sample results detected greater than five times the blank concentrations and nondetects were not qualified.

v. Data quality or usability affected? (Please explain)

Comments:

Some data qualified as estimated; usable as qualified.

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:

The recovery of chloromethane was greater than the upper control limit in a LCS for Method SW8260C.

iv. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

◉ Yes ○ No ○ NA (Please explain.) Comments:

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

Comments:

No samples affected; all associated results not detected.

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?

○ Yes ◉ No ○ NA (Please explain.) Comments:

vii. Data quality or usability affected? (Please explain)

Comments:

All data are usable as reported.

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses - field, QC and laboratory samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

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? If so, are the data flags clearly defined?

○ Yes ○ No ◉ NA (Please explain.) Comments:

No surrogate exceedances.

iv. Data quality or usability affected? (Use the comment box to explain.).

Comments:

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

No data affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

◉ Yes ○ No ○ NA (Please explain.) Comments:

ii. Submitted blind to lab?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$RPD\ (\%) = \text{Absolute Value of: } \frac{(R1 - R2) \times 100}{((R1 + R2)/2)}$$

Where R1 = Sample Concentration
R2 = Field Duplicate Concentration

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

○ Yes ○ No ◉ NA (Please explain.) Comments:

No field duplicate Relative Percent Difference exceedences.

f. Decontamination or Equipment Blank (if applicable)

◉ Yes ○ No ○ NA (Please explain.) Comments:

i. All results less than PQL?

○ Yes ◉ No ○ NA (Please explain.) Comments:

These analytes were detected in the Equipment Blank: Nitrate/nitrite for E353.2.

These analytes were detected in the Equipment Blank: Methane for RSK175.

These analytes were detected in the Equipment Blank: Dissolved Manganese for SW6010B.

These analytes were detected in the Equipment Blank: Ethylbenzene, m,p-Xylene, o-Xylene, Toluene, Total Xylenes for SW8260C.

These analytes were detected in the Equipment Blank: Total Organic Carbon for SW9060.

ii. If above PQL, what samples are affected?

14Q3DA089-AP4413-GW-1, 14Q3DA089-AP4413-GW-0

iii. Data quality or usability affected? (Please explain.)

Associated sample results less than five times the blank concentrations were qualified as estimated and flagged "B". Associated sample results detected greater than five times the blank concentrations and nondetects were not qualified.

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

a. Defined and appropriate?

○ Yes ◉ No ○ NA (Please explain.) Comments:

Calibration:
Lactic acid was detected below the LOQ in a continuing calibration blank. No samples were affected.

Matrix:
The RPD of chloroethane was greater than criteria in the MS/MSD set of sample 14Q3DA089-AP4413-GW-0 for Method SW8260C. The associated nondetected result was not qualified.