19 JULY 2016

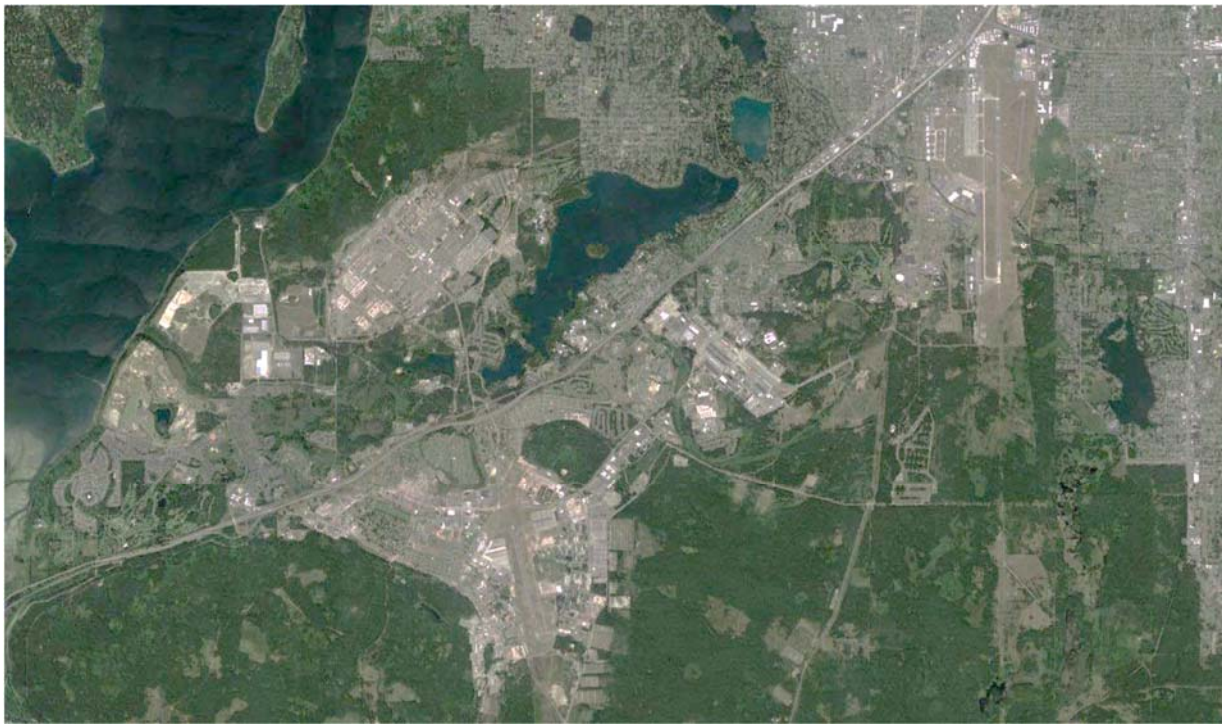
ANNUAL AIR SPARGE AND SOIL VAPOR EXTRACTION SYSTEM PERFORMANCE MONITORING REPORT - 2014

Joint Base Lewis-McChord Area of Concern 9-2
Lewis North Credit Union

Joint Base Lewis-McChord

Pierce County, Washington

Joint Base Lewis-McChord Public Works – Environmental Division
IMLM-PWE
MS 17 Box 339500
Joint Base Lewis-McChord, Washington 98433



DEPARTMENT OF THE ARMY
HEADQUARTERS, JOINT BASE LEWIS-MCCHORD
1010 LIGGETT AVENUE, BOX 339500, MAIL STOP 14A
JOINT BASE LEWIS-MCCHORD, WA 98433-9500

REPLY TO
ATTENTION OF

July 19, 2016

Public Works

Mr. Ben Forson
Washington Department of Ecology
Attention: Toxics Cleanup Program
PO Box 47600
Olympia, Washington 98504-7600

Dear Mr. Forson:

Enclosed for your review is one paper copy of the Annual Air Sparge and Soil Vapor Extraction System, Performance Monitoring Report – 2014, Joint Base Lewis-McChord Area of Concern 9-2, North Base Credit Union. This report focuses on the operation and maintenance of the Air Sparge/Soil Vapor Extraction system completed in 2014 including the physical monitoring (e.g., system operation and pressure monitoring) of the system.

If you have any questions or need clarification, please contact me at (253) 477-3742.

Sincerely,

GHEBRESLLASSIE.MESERET.C.1015675159
Digitally signed by GHEBRESLLASSIE.MESERET.C.1015675159
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=GHEBRESLLASSIE.MESERET.C.1015675159
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Meseret C. Ghebresllassie
Installation Restoration Program Manager
Public Works Department

ANNUAL AIR SPARGE AND SOIL VAPOR EXTRACTION SYSTEM PERFORMANCE MONITORING REPORT – 2014

JOINT BASE LEWIS-MCCHORD AREA OF CONCERN 9-2
LEWIS NORTH CREDIT UNION

CONTRACT NO. W912DW-11-D-1031, TASK ORDER 0001

JULY 19, 2016

JOINT BASE LEWIS-MCCHORD
PIERCE COUNTY, WASHINGTON

SEALASKA ENVIRONMENTAL SERVICES, LLC
POULSBO, WASHINGTON

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Approved by: _____
Scott Elkind, PE
Project Manager
(360-626-3991)

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TABLES

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
AS	air sparge
AS/SVE system	Lewis North Credit Union air sparge, soil vapor extraction, and sub-slab depressurization system
BTEX	benzene, toluene, ethylbenzene, and xylenes
CLARC	Cleanup Levels and Risk Calculation
Ecology	Washington State Department of Ecology
FLAO	Fort Lewis Agreed Order
HVAC	heating, ventilation, and air conditioning
IRP	Installation Restoration Program
JBLM	Joint Base Lewis-McChord
m^3/hr	cubic meters per hour
$\mu g/m^3$	microgram per cubic meter
µg/L	micrograms per liter
MTCA	Model Toxics Control Act
PCS	petroleum contaminated soil
PID	photoionization detector
PQL	practical quantification limit
PSCAA	Puget Sound Clean Air Agency
psi	pounds per square inch
Sealaska	Sealaska Environmental Services, LLC
SIM	Selected Ion Mode
SSD	sub-slab depressurization
SVE	soil vapor extraction
SVP	soil vapor probe
TPH-G	gasoline-range total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
UST	underground storage tank
VOC	volatile organic compound
ZOI	zone of influence

1 INTRODUCTION

This annual performance monitoring report was prepared by Sealaska Environmental Services, LLC (Sealaska) for Joint Base Lewis-McChord (JBLM) Public Works, Installation Restoration Program (IRP). The report documents the 2014 operations, maintenance, and monitoring conducted at the Lewis North Credit Union air sparge (AS), soil vapor extraction (SVE), and sub-slab depressurization (SSD) system (hereafter referred to as AS/SVE system) at JBLM, Washington (Figure 1-1). The AS/SVE system was installed to remediate petroleum-impacted soil and groundwater at a former fueling station (former Building A1033, i.e., site Area of Concern [AOC] 9-2) which is currently the site of the Lewis North Credit Union (Figure 1-2).

This is the first annual Performance Monitoring Report completed for the AS/SVE system at the Lewis North Credit Union. The purpose of this report is to present the information used to verify the effectiveness of the AS/SVE system in removing petroleum contamination from soil and groundwater at AOC 9-2. Since no monitoring reports were completed since AS/SVE system start-up in 2012, this report also includes additional relevant data and other information collected in the 2-year period since startup.

Three types of monitoring are conducted to evaluate the effectiveness of the system:

- Performance monitoring;
- Groundwater monitoring; and
- Vapor intrusion and ambient air monitoring.

Operation, maintenance, and monitoring were conducted in 2014 in accordance with the Final Interim Action Workplan for Area of Concern 9-2, Sub-Slab Depressurization, Air Sparge and Soil Vapor Extraction System at Joint Base Lewis-McChord (Versar 2013a). Requirements and included:

- Monitor and maintain operation and performance of the AS/SVE system;
- Monitor and maintain the effectiveness of SSD and vapor mitigation system for protection of building occupants from volatile organic compound (VOC) intrusion and removal of VOCs for site remediation;
- Monitor zone of influence (ZOI) of AS/SVE system to ensure VOC capture;
- Monitor VOC concentrations in SVE exhaust to ensure contaminant removal;

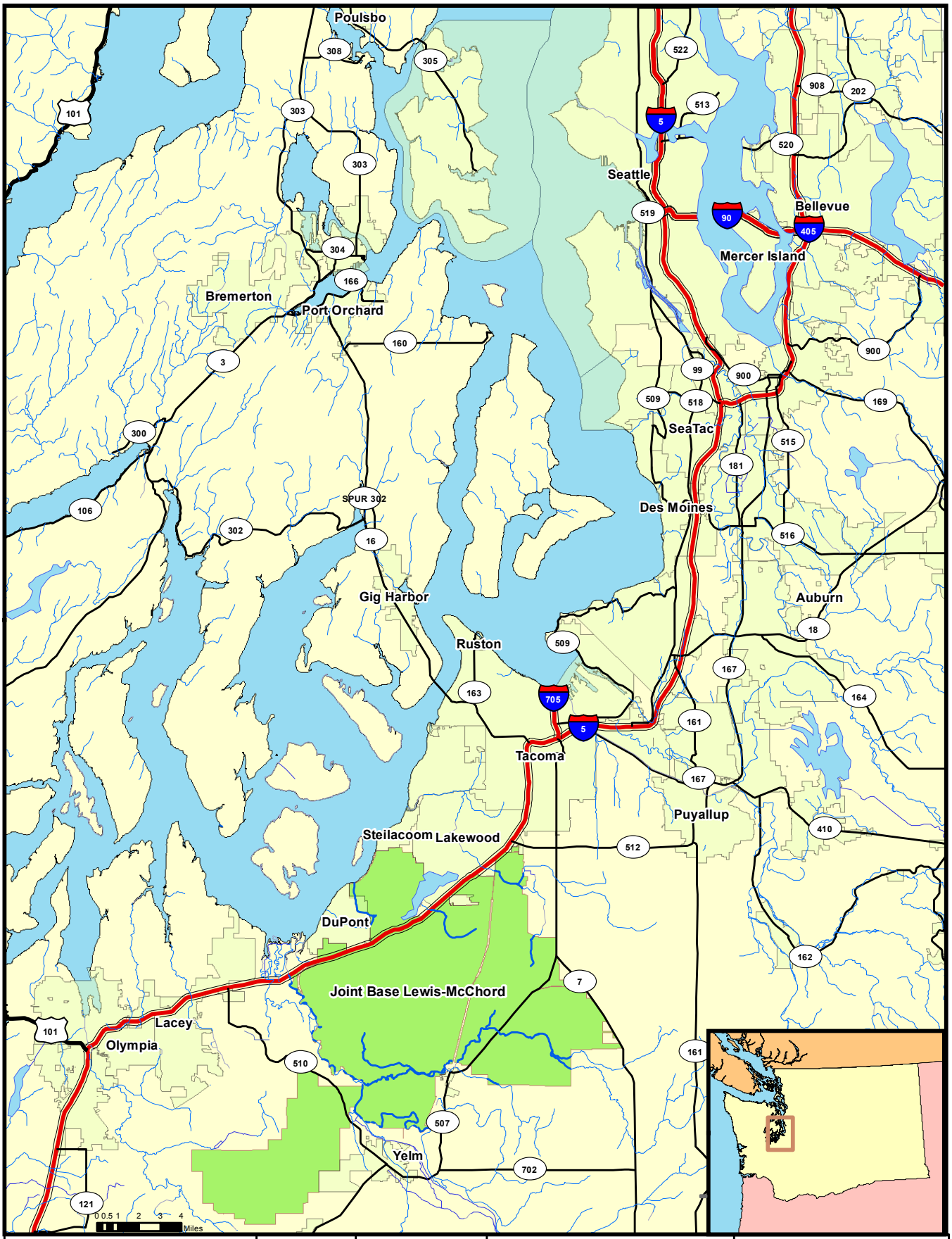
- Confirm that VOCs concentrations associated with onsite residual contamination above regulatory criteria are not migrating into the Credit Union building; and
- Observe changes in VOC concentrations in groundwater through semi-annual monitoring to document the effectiveness of the remedial action. (Results of groundwater monitoring at AOC-9-2 are presented in the Draft Final Fort Lewis Agreed Order (FLAO) Groundwater Monitoring Report (Sealaska 2015) and summarized in this report.)

Additionally, the Interim Action Workplan provided defined criteria for system shutdown, including extent of VOC removal as indicated by SVE exhaust and VOC concentrations in soil vapor and groundwater. The goal of remediation by AS/SVE is to satisfy Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A cleanup standards for groundwater.

1.1 BACKGROUND

The former vehicle fueling station site is located on the southwest corner of the intersection of 17th Street and A Street on Lewis North (Figure 1-2). The station, constructed in 1967, consisted of a 10 feet x 15 feet office and a 30 feet x 60 feet metal canopy. Records indicate that two 4,000-gallon tanks were removed in 1990. Significant soil contamination was encountered during the removal of two additional 4,000-gallon gasoline underground storage tanks (USTs) in 1994. As a result, 1,138 cubic yards of petroleum contaminated soil (PCS) was removed at that time. The excavation was limited by groundwater and the foundation of the former Building A1033. A 1996 Site Assessment Report (USACE 1996) outlines events associated with the 1994 UST removal and subsequent investigations, including monitoring well installation.

In 1998, a 10,000-gallon gasoline tank, associated piping, and fuel dispenser were removed. No additional soil removal took place during the 1998 tank removal because no evidence of a release associated with this tank was discovered. The 1998 UST removal and details of associated site characterization were presented in the June 1999 Field Report for JBLM UST & PCS Removal and Disposal (Garry Struthers & Associates 1999).



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Map Data: Coordinate System: UTM Zone 10 Horizontal Datus: WGS 84	USACE	SEALASKA	**Figure 1-1** **Joint Base Lewis-McChord** **Location Map**	**Contract #** **W912DW-11-D-1031** **Task Order 0001**

Map Data: Coordinate System: UTM, Zone 10 Horizontal Datum: WGS 84	**USACE**	**SEALASKA**	Figure 1-2 Location of Lewis North Credit Union

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Date: 5/24/2016

The building was demolished in 2002. Two additional USTs were discovered during excavation for construction of a Credit Union building in June 2009. The USTs were located adjacent and north of the four USTs removed in 1990 and 1994. The tanks removed in 2009 were estimated to have a capacity of about 1,000 gallons each and appeared to have been closed-in-place with concrete fill. Laboratory results of the samples collected from the floors and sidewalls of the UST excavation indicate that diesel was present in the soil at concentrations below MTCA Method A levels for unrestricted use.

Construction of the Credit Union building at AOC 9-2 was completed in early 2010. Because gasoline was present in groundwater underlying the site, JBLM elected to install the AS/SVE system during building construction for the protection of building occupants. Two AS wells were installed in May 2009. The SVE system began operation in February 2010. A November 2011 pilot test and February 2012 vapor intrusion monitoring were conducted to evaluate the effectiveness of AS/SVE for site remediation and SSD for protection of building occupants. The results of the pilot test and vapor intrusion monitoring (Versar 2013b) suggested that the existing system would be adequate to achieve site remediation. The AS system operation was initiated as part of the pilot test. The system has continued to be in operation since the pilot test start up.

Conditions at AOC 9-2, the site of a former vehicle fueling station, are described in the Fort Lewis Agreed Order Draft Feasibility Study for Seven Sites (Versar 2009a) and the Remedial Investigation Report for Nine Agreed Order Sites (Bussey 2008).

The chronology of investigation events area summarized in Table 1-1 below.

Table 1-1. Investigation Chronology

Event	Date
Gas station constructed	1967
Two 4,000 gallon gasoline tanks removed	1990
Two additional 4,000 gallon gasoline tanks removed	1994
Removal of 1,138 cubic yards of PCS	1994
Monitoring wells 95-A17-1, 95-A17-2, 95-A17-3, 95-A17-3A, and 95-A17-4 installed	1995
Groundwater monitoring	1995-current
Site Assessment Report completed (USACE 1996)	1996
Monitoring wells 96-A17-5 and 96-A17-6 installed	1996
Removal of 10,000 gallon gasoline tank	1998
Field Report for JBLM UST & PCS Removal and Disposal (Garry Struthers & Associates 1999)	1999
Building demolished	2002
Monitoring well 07-A17-7 installed	2007
Two additional diesel USTs discovered closed in place (1,000 gallons each)	2009
Soil samples found diesel concentrations below MTCA Method A associated with diesel USTs	2009
Construction of AS/SVE system	2009
Two air sparge wells installed	2009
Construction of Credit Union building	2010
Monitoring well 10-A17-8 installed	2010
Eleven soil vapor probes installed	2010
Pilot test, startup, and initial vapor intrusion monitoring completed (Versar 2013b)	2012
AS/SVE system operation and monitoring	2012-current

Notes:
AS/SVE – air sparge/soil vapor extraction
MTCA – Model Toxics Control Act
PCS – petroleum contaminated soil
USACE – United States Army Corps of Engineers
UST – underground storage tank

1.2 REPORT ORGANIZATION

This report is organized as follows:

Section 1 **Introduction** – provides an overview of the project and the site description and background.

Section 2 **System Description** – provides a description of the AS/SVE system and components.

Section 3 **Performance Monitoring and Maintenance** – identifies what monitoring and maintenance have been completed during the performance period.

Section 4 **Groundwater Monitoring** – provides a summary of the semi-annual groundwater monitoring completed at the site and results.

Section 5 **Vapor Intrusion and Ambient Air Monitoring** – presents a summary of the annual vapor intrusion and ambient air monitoring and results.

Section 6 **Deviations from Interim Action Workplan** – provides a list of deviations from the requirements of the Workplan.

Section 7 **Conclusions**

Section 8 **Recommendations**

Section 9 **References**

2 SYSTEM DESCRIPTION

This section provides a brief description of the AS/SVE system. Figure 2-1 shows the layout of the SVE system. A vertical cross-section of the system beneath the Credit Union building is shown in Figure 2-2. A detailed description of system design is presented in the Draft Design Report, Air Sparge and Soil Vapor Extraction System, Fort Lewis Area of Concern 9-2 (Versar 2009b). In-depth AS/SVE system descriptions are provided in the Final Interim Action Workplan (Versar 2013a) and Sub-slab Depressurization, Air Sparge and Soil Vapor Extraction System, Pilot Test Startup and Vapor Intrusion Monitoring Report (Versar 2013b).

2.1 VAPOR BARRIER DESCRIPTION

A vapor barrier membrane underlies the building slab. A combination of the sub-slab vapor barrier and sealed slab penetrations provides passive protection against fuel vapors entering the building. Vapor sampling ports penetrate the building footings at five points to allow for measurement of vacuum pressure and sub-slab air quality. The areas where these points penetrate the footings are also sealed to reduce the potential for vapors entering the building or escaping.

2.2 SOIL VAPOR EXTRACTION/SUB-SLAB DEPRESSURIZATION SYSTEM DESCRIPTION

The SVE system consists of a vacuum blower housed in a small shed on a concrete pad located near the southwest corner of the site adjacent to the stormwater pond (see Figure 2-1). The SVE system maintains a negative pressure under the slab and vapor barrier. In addition, the building heating, ventilation, and air conditioning (HVAC) system maintains a positive pressure in the building interior. By maintaining this pressure differential over the slab and sub-slab system, soil vapors are drawn into the underlying extraction laterals, and away from the vapor barrier membrane.

Approximately 95% of the building site is covered with either asphalt or concrete. The capped site minimizes infiltration of surface air, maximizing the effectiveness of the SVE system. In addition, landscaped areas along the building foundation are planted with grass rather than less dense shrubbery.

2.3 AIR SPARGE SYSTEM DESCRIPTION

Figure 2-1 shows the site plan including the AS system layout. The AS system consists of a rotary vane blower, piping, and two vertical AS wells.

The AS blower is installed in a concrete vault located in the landscaped strip at the east edge of the property. The blower supplies air to the two sparge wells via a manifold (Figure 2-1, ASW-1 and ASW-2). Pressure indicators, flow regulating valves, and check valves are installed on the air supply manifold in the vaults at the top of the air sparge wells. Flow gauges are installed at each well head to measure air flow rate.

Operation of the system has resulted in identifying the optimal on/off pulsing to maximize the sparging efforts. The system is set on a timer and currently, the system is sparging four times daily for 30 minutes on followed by an inactive sparging period of approximately 5.5 hours off.

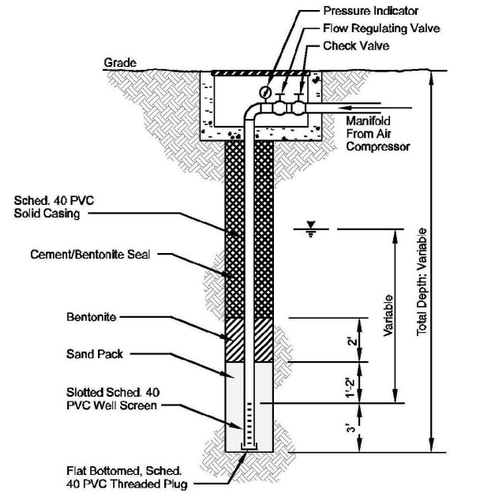
2.4 SOIL VAPOR PROBES

The system includes 11 soil vapor probes (SVPs). SVPs were placed at 20 foot intervals extending perpendicular to the midpoint of the north lateral as shown in Figure 2-1. The probes were installed to depths within the ZOI (see Figure 2-2) that was calculated during completion of the pilot test (Versar 2013b). Soil vapor samples are collected from the SVPs and analyzed for gasoline-range total petroleum hydrocarbons (TPH-G) and benzene, toluene, ethylbenzene, and xylenes (BTEX) to evaluate the effectiveness of the AS/SVE system. Soil vapor pressures are also measured to assess the ZOI of the AS and SVE blowers and confirm the ZOI calculated during pilot testing is still applicable.

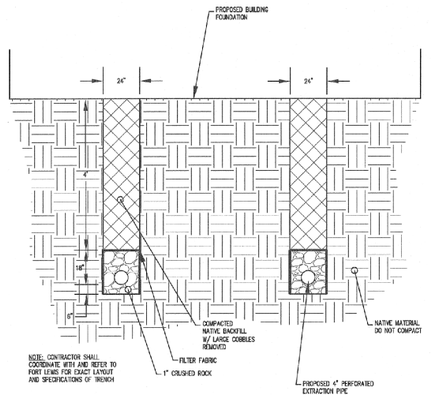
2.5 GROUNDWATER MONITORING WELLS

Eight groundwater monitoring wells are installed at AOC 9-2. The locations of the wells are identified in Figure 2-1. Sampling of groundwater monitoring wells is used to assess the progress of remedial action and overall groundwater quality at AOC 9-2.

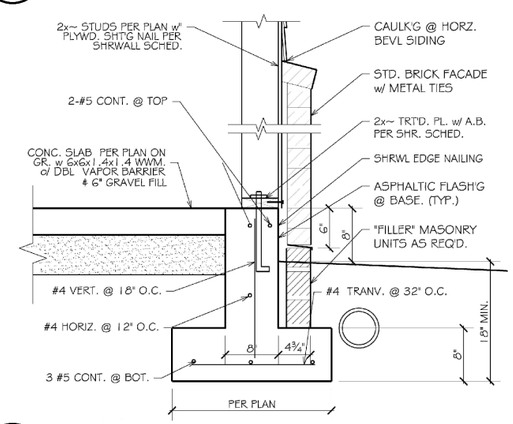
Typical Vertical Air Sparging Well Construction



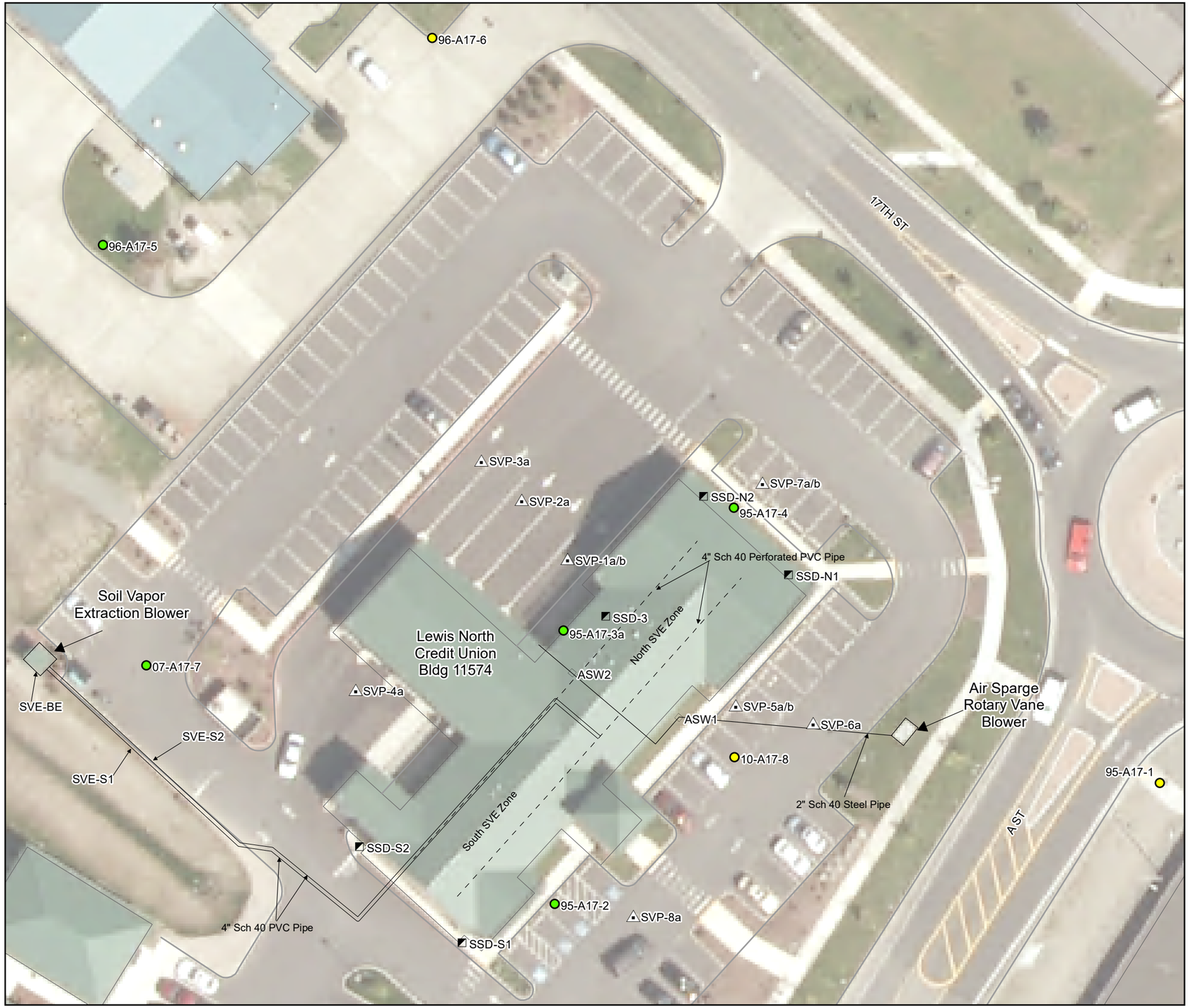
1 Air Sparge Well Construction



2 Vapor Extraction System Trench



3 Typical Footing



Legend

- Soil Vapor Probe
- Vacuum Port
- Air Sparge Well
- Monitoring Well
- Monitoring Well w/Transducer

0 5 10 20 Feet

N

Map Data:
Coordinate System: UTM, Zone 10
Horizontal Datum: WGS 84

USACE | **SEALASKA**

Figure 2-1
AOC 9-2
Air Sparge and Soil Vapor Extraction Layout

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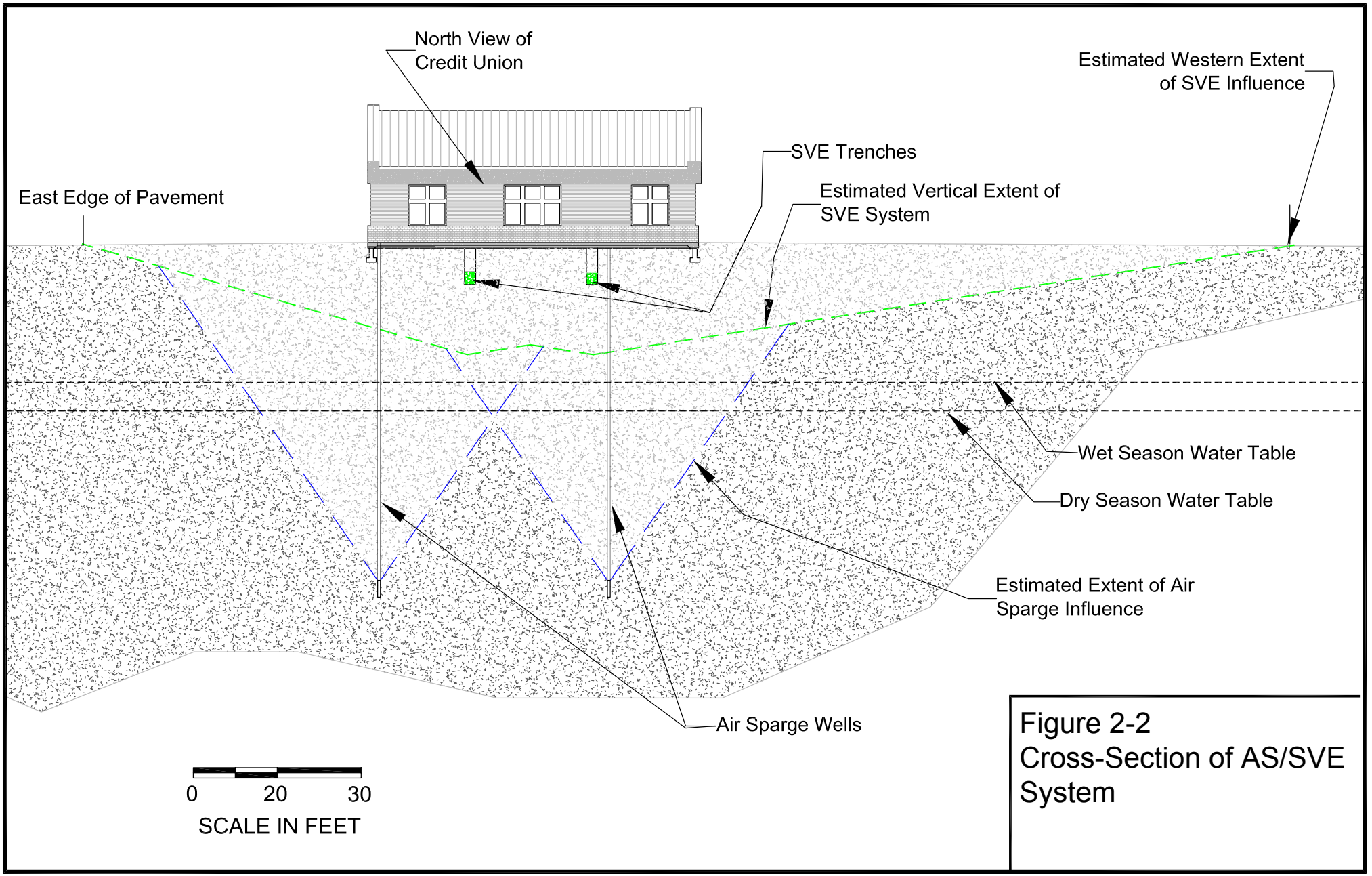


Figure 2-2
Cross-Section of AS/SVE System

3 PERFORMANCE MONITORING AND MAINTENANCE

Routine performance monitoring includes sampling to observe trends in groundwater and soil vapor concentrations, monitoring SVE and SSD performance including measuring sub-slab pressures, and assessing the ability of the system to strip and remove VOCs. Performance monitoring focuses on:

- Operating the AS/SVE system equipment to allow efficient and effective remediation of contaminants in groundwater and soil at the site;
- Monitoring air flow throughout the system to ensure contaminants in soil vapor are removed and to maintain negative sub-slab pressure to prevent vapor intrusion into the Credit Union building;
- Monitoring operating temperature to prevent damage to system components;
- Confirming that VOCs are being removed by the system; and
- Ensuring emissions from the AS/SVE system are not above Puget Sound Clean Air Agency's (PSCAA) criteria.

All AS/SVE system operations, maintenance, and air monitoring activities were recorded on system log sheets. System log sheets for 2014 are provided in Appendix A. Collected field data for 2014 along with historical data is provided in Appendix B.

The following sections provide the results of performance monitoring conducted in 2014. A description of the required monitoring and maintenance activities is provided in the Final Interim Action Workplan (Versar 2013a).

3.1 AS/SVE SYSTEM INSPECTION AND MAINTENANCE

AS/SVE system inspection and maintenance are conducted to guarantee continued system operation and to remove residual contamination at the site.

During inspection of the blowers, no unusual noises or oil leaks were detected. No leaks were observed in the exposed AS/SVE systems piping or fittings. The AS and SVE blowers were running smoothly and shafts did not require alignment.

The output of the AS blower is 20 pounds per square inch (psi). After piping and fitting head losses, the normal operating pressure at well heads is approximately 17 psi. The AS well head's pressure readings were recorded and within operating condition. AS well heads and injection lines required no maintenance in 2014.

The SVE system uses a 30-gallon knock-out drum to remove liquids that either are removed by the vacuum blower or condense during the extraction process. The knock-out drum water level is monitored and emptied weekly. Knock-out drum water is removed from the drum and collected in a 5-gallon bucket. The water is ultimately disposed of through the Landfill 2 pump and treat system.

During the pilot test in 2011, sparging frequency was limited to 1 hour per week to test the system functionality. Water level loggers were installed in May 2014 at wells 95-A17-2, 95-A17-3A, 95-A17-4, 96-A17-5, and 07-A17-7 to monitor potential groundwater mounding and downgradient effects around the contaminant source area. A Solinst Barologger was installed at the SVE building to monitor site-specific barometric pressure changes to correct water level datalogger data. Sparging frequency was increased to 1 hour per day in June 2014 and when mounding effects were observed to be minor at perimeter wells, the sparging was increased to 30 minutes, four times per day in November 2014.

3.2 AIR FLOW AND TEMPERATURE MONITORING

Airflow is monitored to ensure that flow through the system is maintained at a maximum level to allow for efficient removal of VOCs. Temperature is monitored to ensure that higher than normal temperatures that could potentially damage system equipment and infrastructure are not present.

The normal airflow velocity in the system is approximately 40 to 50 meters per second. In 2014, the measured airflow velocity of the SVE suction lines were within normal range.

The acceptable temperature at the AS wells (ASW-1 and ASW-2) and in the SVE suction lines is less than 129°F. This corresponds to the lowest temperature where Schedule 40 polyvinyl chloride (PVC) can distort. All temperatures measured for the AS well heads and SVE suction lines were below this value.

Collected monitoring data is provided in Appendix B, Table B-1.

3.3 BUILDING AND SUB-SLAB PRESSURE MONITORING

Monitoring SSD system performance is focused on the protection of building occupants and ensuring that negative pressure is continuously maintained. The effectiveness of the SSD system in mitigating vapor intrusion was assessed by measuring the pressure differentials across the building floor slab.

Sub-slab pressures were measured at five SSD monitoring points (SSD-3, SSD-S1, SSD-S2, SSD-N1, and SSD-N2) weekly utilizing a magnehelic vacuum gauge. Sub-slab differential pressures recorded from the SSD monitoring points fluctuated between 0.01 to 0.04 inches of water, indicating that negative pressures were maintained for the duration of 2014. Monitoring location are provided in Figure 2-1 with measurement results provided in Table 3-1.

Historical data indicates negative pressure has been maintained beneath the building since system startup in 2012. Historical monitoring data is provided in Appendix B, Tables B-1 and B-2.

During operation, water occasionally accumulates in the sub-slab ports, especially SSD-S1 and SSD-S2 on the south side of Credit Union building at AOC 9-2. It is presumed that water vapor and liquid condense and collect on the sub-slab vapor barrier and flow to the low areas under the building, such as the sub-slab monitoring ports. The occasional small amount of water (< 500 mL) is pumped out by drill pump prior to measurement of sub-slab vacuum pressures.

Table 3-1. Differential Pressures at Sub-Slab Depressurization Ports

	Sub-Slab Pressures (inch of water)				
Date	**SSD-S1 (Southeast)**	**SSD-S2 (Southwest)**	**SSD-N1 (Northeast)**	**SSD-N2 (Northwest)**	**SSD-3 (inside)**
01/02/2014	0.02	0.02	0.025	0.02	0.01
01/10/2014	0.02	0.02	0.02	0.025	0.01
01/16/2014	0.02	0.02	0.04	0.035	0.01
01/23/2014	0.025	0.02	0.03	0.025	0.015
01/30/2014	0.045	0.05	0.025	0.03	0.015
02/06/2014	0.01	0.01	0.02	0.02	0.01
02/20/2014	-	-	-	-	-
03/13/2014	0.015	0.02	0.02	0.02	0.015
03/20/2014	0.015	0.015	0.03	0.022	0.02
03/28/2014	0.02	0.02	0.03	0.025	
04/03/2014	0.02	0.02	0.02	0.025	0.015
04/10/2014	0.015	0.01	0.025	0.02	0.01
04/24/2014	0.02	0.02	0.03	0.025	0.01
05/01/2014	0.01	0.015	0.02	0.02	0.01
05/30/2014	0.015	0.015	0.025	0.035	0.02
06/06/2014	0.015	0.015	0.02	0.02	0.01
06/18/2014	-	-	-	-	-
06/24/2014	0.015	0.015	0.025	0.025	0.02
07/03/2014	0.015	0.015	0.02	0.025	0.01
07/30/2014	0.025	0.025	0.03	0.03	0.02
08/05/2014	0.035	0.035	0.03	0.035	0.02
08/12/2014	0.03	0.02	0.025	0.025	0.015
08/19/2014	0.02	0.035	0.03	0.025	0.02
08/29/2014	0.015	0.025	0.03	0.025	0.025
09/08/2014	0.03	0.02	0.04	0.03	0.015
09/12/2014	0.02	0.02	0.03	0.03	0.02
09/19/2014	0.01	0.015	0.03	0.02	
09/29/2014	0.03	0.03	0.03	0.035	0.015
10/06/2014	0.02	0.02	0.025	0.035	0.015
11/04/2014	0.03	0.03	0.035	0.035	0.015
11/10/2014	0.015	0.01	0.035	0.035	0.015
11/17/2014	0.025	0.025	0.03	0.035	0.01
11/26/2014	0.03	0.03	0.03	0.03	0.015
12/05/2014	0.025	0.025	0.03	0.035	0.01
12/12/2014	0.03	0.025	0.03	0.03	0.015
12/24/2014	0.025	0.03	0.03	0.035	0.015
Avg. SSD	0.02	0.02	0.03	0.03	0.01

Notes:
Differential pressures were obtained using magnehelic gauge.
- – No data, not applicable

3.4 AS/SVE SYSTEM EXHAUST MONITORING

Weekly monitoring of SVE exhaust was conducted using a photoionization detector (PID). Semi-annual SVE exhaust samples were collected using Tedlar bags on June 24, 2014 and November 4, 2014. During each event, four samples were collected from the bulk air stream at the center of the SVE blower exhaust pipe over an 8-hour period. Results are provided in Table 3-2.

Vapor samples from the AS/SVE system exhaust were collected to:

- Analyze long-term system performance, and
- Verify the system is compliant with the PSCAA total maximum allowable emission limit of:
  - 15 pounds of benzene per year for an unpermitted water treatment facility related to soil and groundwater remediation projects (PSCAA 2015, Section 6.03(c)(94))
  - 50,000 pounds of VOCs per year for an unpermitted facility (PSCAA 2015, Section 5.03(a)(3)(C)).

The November 4, 2014 air monitoring data was used to assess the total estimated emissions for 2014. Concentrations of benzene were below 1 microgram per cubic meter (µg/m^3) over an 8-hour period on November 4. Assuming continuous hourly emissions with a maximum blower flow rate (per the manufacturers specifications) of 476 cubic meters per hour (m^3/hr):

(a) $1\ \frac{\mu g}{m^3} \times 476 \frac{m^3}{hr} = 476\ \frac{\mu g}{hr}$

(b) $476\ \frac{\mu g}{hr} \times 8{,}765.81 \frac{hrs}{year} \times 10^{-6} \frac{g}{\mu g} \times\ 0.0022 \frac{lbs}{g} = \mathbf{0.0092} \frac{\boldsymbol{lbs}}{\boldsymbol{year}}\ \boldsymbol{benzene}$

Total benzene emissions are estimated to be below 0.01 pounds per year and well below the 15 pounds per year PSCAA criteria.

Concentrations of TPH-G were below 1,000 µg/m^3 over an 8-hour period on November 4, 2014. Assuming continuous hourly emissions with a maximum blower flow rate of 476 m^3/hr:

(a) $1{,}000\ \frac{\mu g}{m^3} \times 476 \frac{m^3}{hr} = 476{,}000\ \frac{\mu g}{hr}$

(b) $476{,}000\ \frac{\mu g}{hr} \times 8765.81 \frac{hrs}{year} \times 10^{-6} \frac{g}{\mu g} \times\ 0.0022 \frac{lbs}{g} = \mathbf{9.2} \frac{\boldsymbol{lbs}}{\boldsymbol{year}}\ \boldsymbol{TPH - G}$

Total VOC emissions are estimated to be below 10 pounds per year well below the 50,000 pounds per year PSCAA criteria.

As noted previously, weekly monitoring of SVE exhaust was performed using a PID. Figure 3-1 shows a plot of the weekly PID values versus time. The PID monitoring has indicated a general downward trend in VOC concentrations. However, the downward trend could be attributed to the sample time not corresponding to the vapor migration time through the SVE system resulting from pulsing of the AS system. The AS blower cycles have been included on Figure 3-1.

The quarterly data collected using Tedlar bags is more useful in evaluating concentration trends in the SVE exhaust. Tedlar bag sampling data provides a greater range of analyte concentrations (individual VOCs of concern and TPH-G), which is useful in assessing more accurately what contaminants of concern remain in the air stream. The data is also useful as an indication of the effectiveness of the AS/SVE system and success of the remedial action, especially related to a specific contaminant of concern.

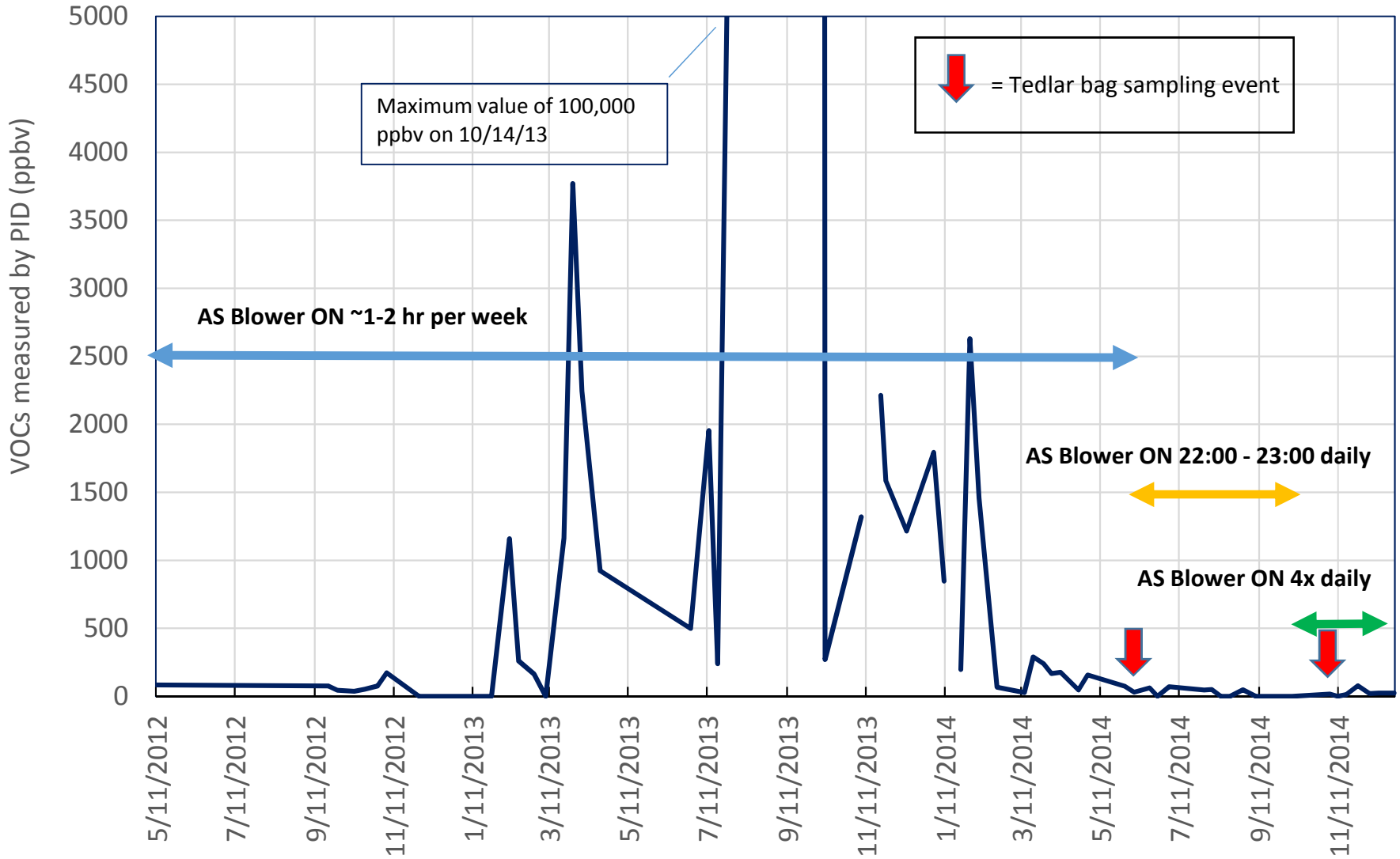
Beginning in 2015, for each quarterly event Tedlar bag samples will be collected at approximately the same time intervals (1000, 1300, 1530, and 1800). With the AS blower cycles currently set for the same times daily and the sampling intervals also set, the concentrations values collected should represent similar system conditions (i.e., time between blower cycle and sample collection) for each time interval for each quarterly event.

Table 3-2. 2014 Results of SVE Exhaust Tedlar Bag Samples

Date	Sample ID	TPH-G (ppbv)	TPH-G (µg/m^3)	Benzene (µg/m^3)	Toluene (µg/m^3)	Ethyl-benzene (µg/m^3)	m,p Xylene (µg/m^3)	o-Xylene (µg/m^3)	Total Xylenes (µg/m^3)[1/]
6/24/2014	AOC9-2SVE140624-1100	ND	ND	ND	14.0	ND	ND	ND	ND
	AOC9-2SVE140624-1200	ND	ND	ND	11.0	ND	ND	ND	ND
	AOC9-2SVE140624-1300	ND	ND	ND	12.0	ND	ND	ND	ND
	AOC9-2SVE140624-1400	ND	ND	ND	23.0	ND	ND	ND	ND
11/4/2014	AOC9-2-141104SVE 1000	41.57	170	0.74	7.4	1.2	3	1.2	4.2
	AOC9-2-141104SVE 1300	100.25	410	0.54	8	0.89	2.8	0.78	3.58
	AOC9-2-141104SVE 1530	70.91	290	0.47	6.9	0.76	2.4	0.78	3.18
	AOC9-2-141104SVE 1800	97.8	400	0.55	6.7	0.77	2.2	0.67	2.87
	AOC9-2-141104SVE DUP	83.13	340	0.48	7.4	0.81	2.4	0.81	3.21

Notes:
[1/] Total xylenes are calculated from sum of m,p- and o-xylenes.
ppbv – parts per billion by volume
ND – Not Detected

Figure 3-1
Weekly VOC Concentrations at SVE Blower Exhuast
May 2012 through December 2014



4 GROUNDWATER MONITORING

This section provides a summary of the semi-annual groundwater monitoring that is conducted at the AOC 9-2 site. The locations of groundwater monitoring wells are shown in Figure 4-1. Data collected during groundwater monitoring is used to:

- Assess possible mounding in the groundwater table and plume mobilization caused by the AS system; and
- Assess the success of the implemented remedial action at the site.

Depth to water and field parameter measurements collected in 2014 are provided in Appendix C, Table C-1. Current and historical groundwater analytical results for TPH-G and BTEX concentrations is provided in Appendix C, Table C-2.

Detailed information regarding the groundwater sampling and results can be found in the Draft Final Fort Lewis Agreed Order Groundwater Monitoring Report (Sealaska 2015).

There is a minor concern with possible exposure to total organic vapors during groundwater monitoring activities. This is especially true within the ZOI for the AS system do to the injection of air into the groundwater and possible migration of contaminants in air through the well. During groundwater monitoring, well purging and sampling, total organic vapor levels in the breathing zone of workers are measured using a PID.

4.1 WATER LEVEL MONITORING RESULTS

Groundwater level plots from the March and September 2014 sampling events are presented on Figures 4-2 and 4-3 respectively.

Air sparging can create groundwater mounding due to the displacement of water by injected air. Therefore, water levels are closely monitored for mounding and the possible associated plume mobilization. Water level data is also used to determine if modifications to sparge duration and frequency are required. This may include decreasing the duration and frequency because excessive mounding is occurring or possibly increasing the duration to increase the effectiveness of the VOC removal by air sparging.

Figure 4-4 shows the long-term trend of water levels since the installation of water level loggers in wells 95-A17-2, 95-A17-3A, 95-A17-4, 96-A17-5, and 07-A17-7. Beginning on June 24, 2014, the AS blower was programmed to turn on for 30 minutes four times a day (0600, 1200, 1800, and 0000). Mounding effects caused by air sparging are observed almost immediately at

monitoring wells 95-A17-2 and 95-A17-3A with water levels rising approximately 2 feet (Figure 4-5). The increased water level fluctuation observed on Figure 4-4 represents the increase in daily AS events. After the blower turns off, groundwater levels return to static levels. Mounding effects were not observed at or beyond the site perimeter. When operating at a 30 minute AS cycle, mounding effects were negligible at perimeter monitoring wells 96-A17-5 and 07-A17-7 indicating low potential for plume mobilization and high effectiveness at the impact area.

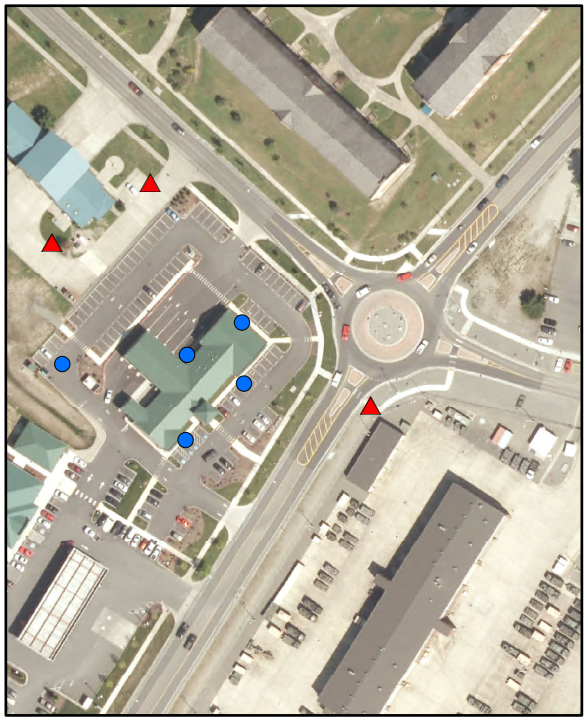
4.2 GROUNDWATER ANALYTICAL RESULTS

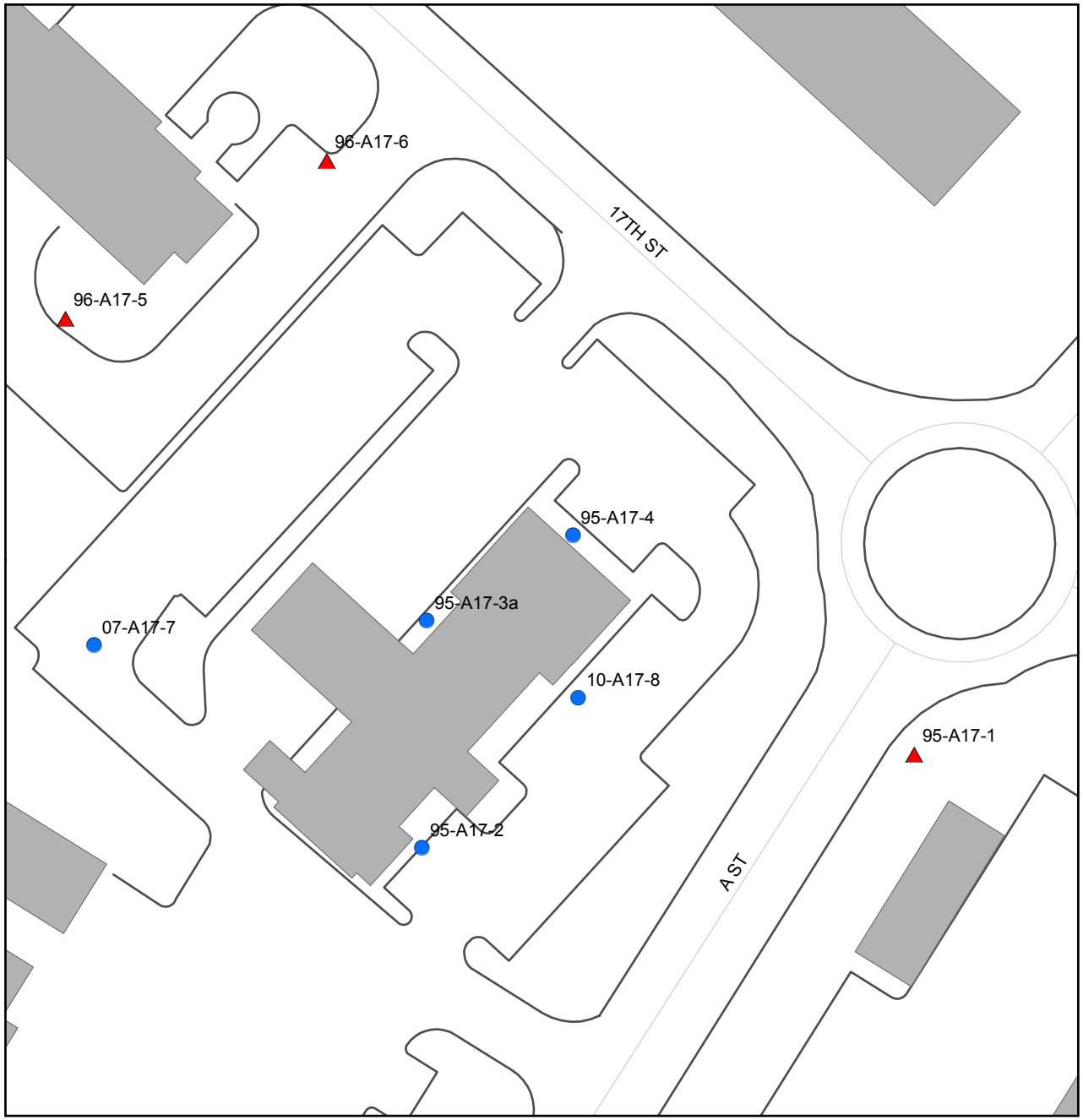
The TPH-G concentration iso-contour lines for the March and September sampling events are presented on Figures 4-2 and 4-3 respectively. Appendix C, Table C-2 presents TPH-G and BTEX analytical results and a comparison to Ecology's MTCA Method A cleanup levels for groundwater.

Historically, 95-A17-3A has been considered at or near the source area since it had the highest detected concentrations of TPH-G at 35,000 micrograms per liter (µg/L) in March 2008. In March and September 2014, TPH-G was detected in samples collected from 95-A17-3A at 15,000 µg/L and 1,400 µg/L, respectively.

In October 2010, monitoring well 10-A17-8 was completed within the boundary of the historical UST excavation and within the calculated ZOI of the AS-1 (Versar 2013b). The highest TPH-G concentration in well 10-A17-8 was 74,000 µg/L in November 2011. In March and September 2014, TPH-G was detected in samples collected from 10-A17-8 at 9,500 µg/L and 3,500 µg/L, respectively. A duplicate sample was collected during the September sampling event from well 10-A17-8. Sample results were consistent with the primary sample (3,700 µg/L).

Benzene concentrations detected in samples collected from 95-A17-3A in March and September 2014, were 36 µg/L and 3.7 µg/L, respectively. Samples collected from 10-A17-8 had benzene detected at 160 µg/L (March 2014) and 46 µg/L (September 2014). A duplicate sample was collected during the September sampling event from well 10-A17-8. Sample results were consistent with the primary sample (50 µg/L).





Notes:

Wet season depth to water measured and samples collected typically during February or March

Dry season depth to water measured and samples collected typically during August or September

95-A17-4 sampled during wet season only

Legend

- Monitoring Well - Depth to Water Measurement and Sample
- Monitoring Well - Depth to Water Measurement

N

0 12.5 25 50

Feet

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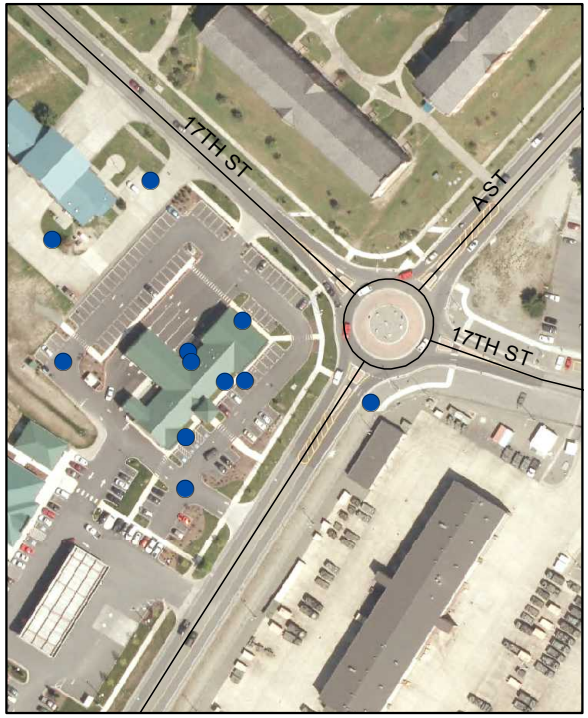
Figure 4-1
Groundwater Monitoring Locations

Path: P:\Production\Fig\JBLM\TO 01A\Credit Union\O&M Report - 2015\Maps\SVE_Fig_4-1_GWM_loc.mxd
Date: 10/6/2015



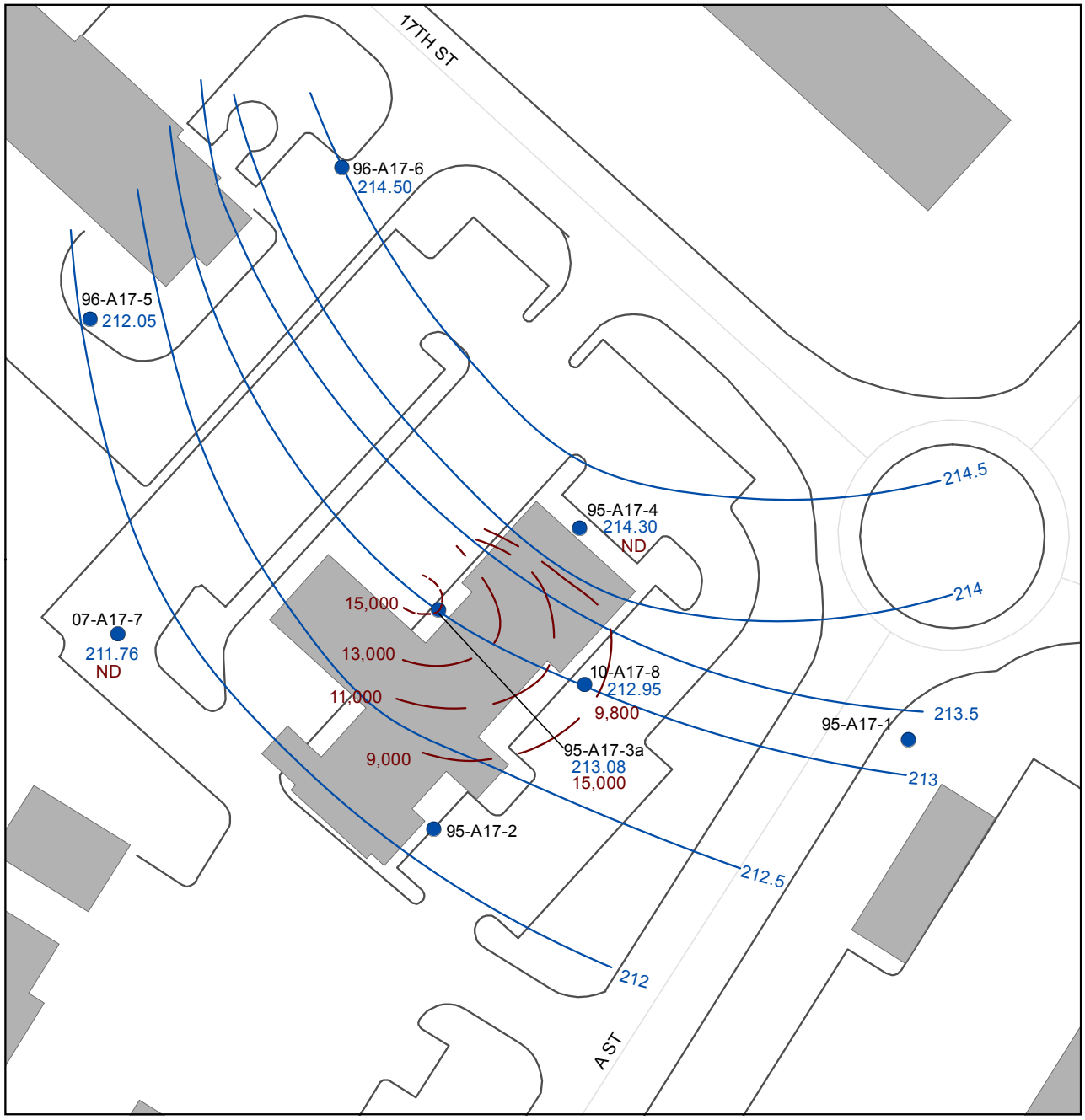
Notes:

Depth to water measurements collected March 10 and 14, 2014.

Groundwater samples collected March 14, 2014.

Legend

- Monitoring Well
- Groundwater Elevation (famsl)
- TPH-G Concentraion (µg/L)



0 15 30 60
Feet

Map Data:
Coordinate System: UTM, Zone 10
Horizontal Datum: WGS 84

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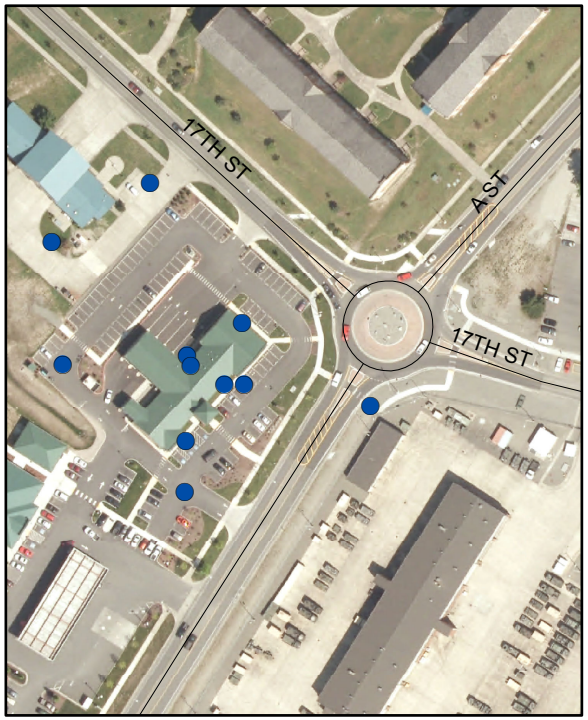
Figure 4-2
Groundwater Elevation and TPH-G Concentration Contours March 2014

Path: P:\Production\Fig\JBLM\TO 01A\Credit Union\O&M Report - 2015\Maps\SVE_Fig_4-2_TPH-G_contours.mxd
Date: 2/24/2016



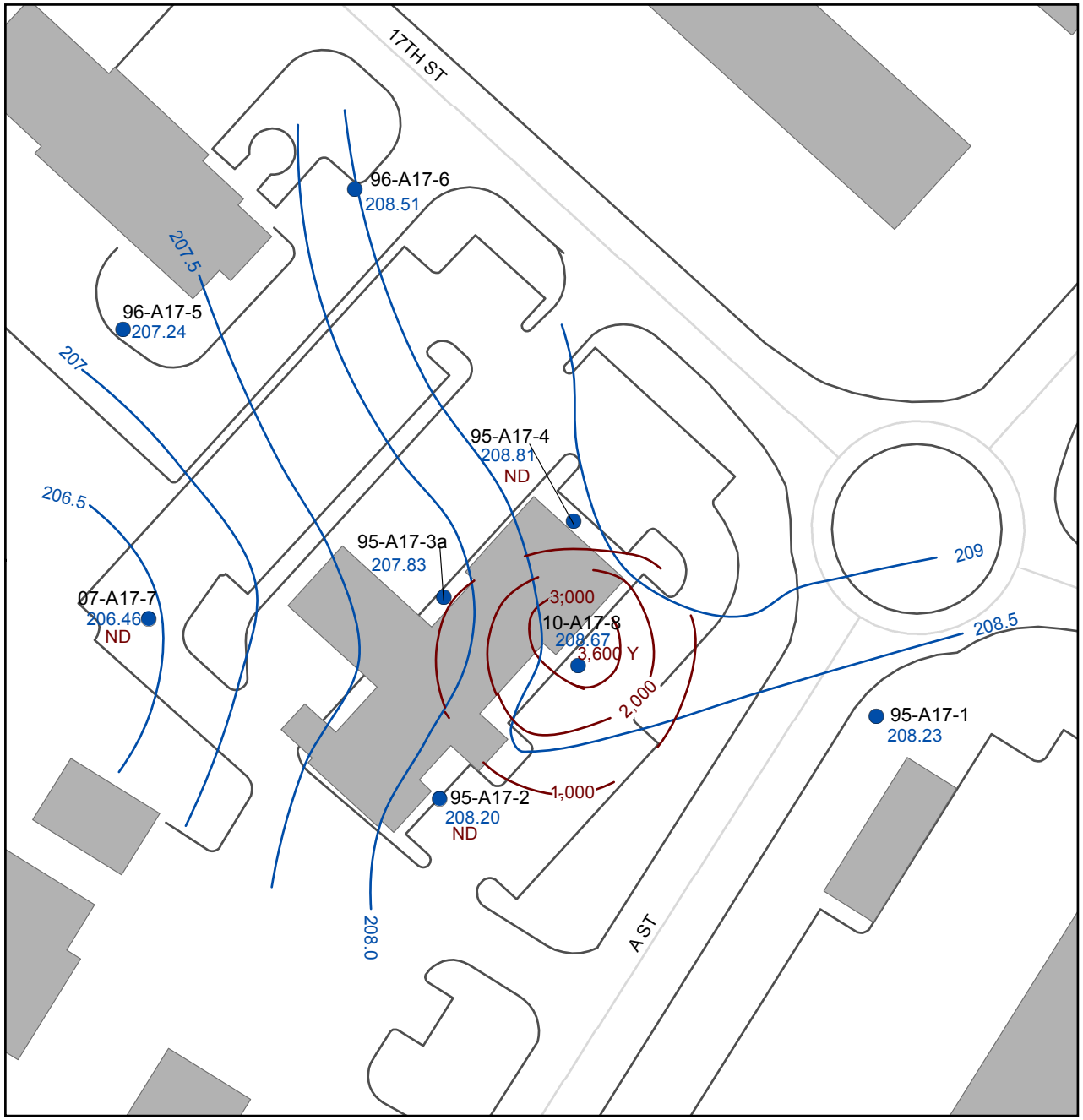
Notes:

Depth to water measurements collected September 16, 2014.

Groundwater samples collected September 22, 2014.

Legend

- Monitoring Well
- Groundwater Elevation (famsl)
- TPH-G Concentraion (µg/L)



N

0 20 40 80

Feet

Map Data:
Coordinate System: UTM, Zone 10
Horizontal Datum: WGS 84

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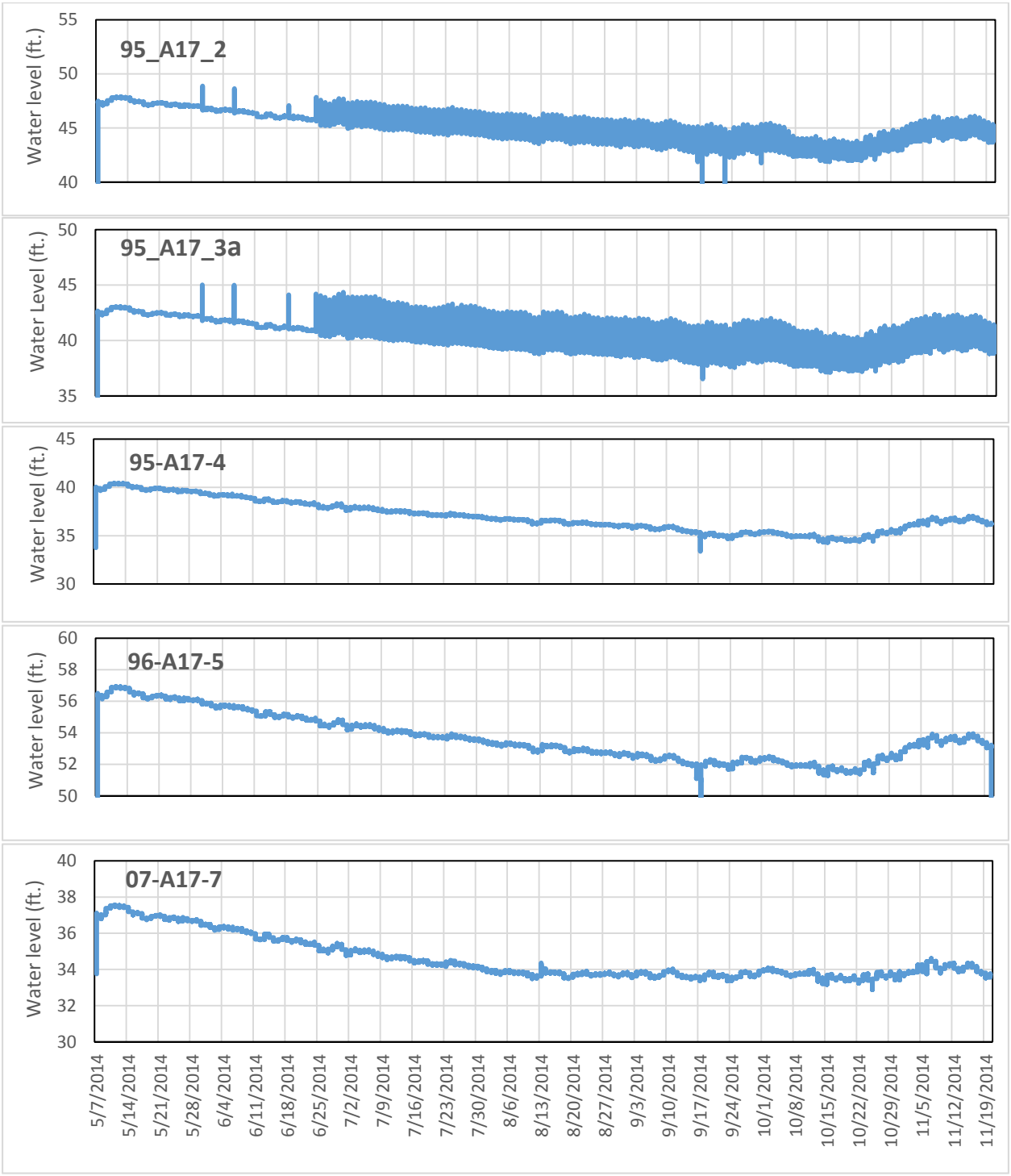
Figure 4-3
Groundwater Elevation and TPH-G Concentration Contours September 2014

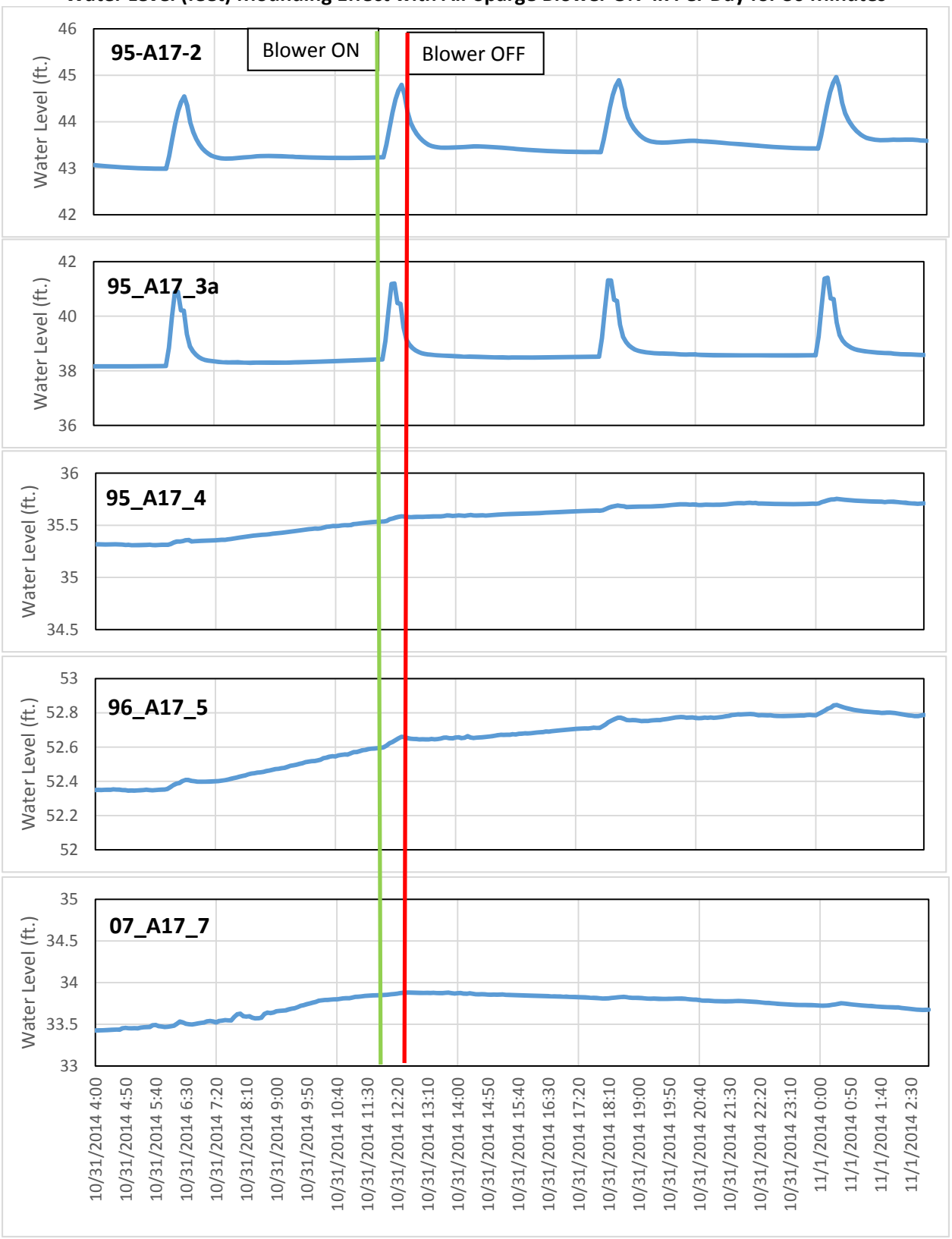
Path: P:\Production\Fig\JBLM\TO 01A\Credit Union\O&M Report - 2015\Maps\SVE_Fig_4-3_TPH-G_Sep_contours.mxd
Date: 10/5/2015

Figure 4-4
Water Level (feet) Measured by Solnist Level Logger
May 2014 – November 2014



Note: water level is in feet above the transducer/level logger.

Figure 4-5
Water Level (feet) Mounding Effect with Air Sparge Blower ON 4x Per Day for 30 Minutes



Note: water level is in feet above the transducer/level logger.

Both benzene and TPH-G were either not detected or detected below their respective cleanup levels in samples collected from all the other monitoring wells during 2014. Figures 4-6a through h presents TPH-G and benzene concentrations in monitoring wells 95-A17-2, 95-A17-3A, 07-A17-7, 10-A17-8 over time. Analytical data for well 95-A17-4, which has only had a detectable concentration of TPH-G once since 2003 and no detection of BTEX, was not plotted since the well does not provide information on contaminant concentration trend or the effect of the remedial action.

Since startup of the AS/SVE system:

- Well 95-A17-3A is below MTCA clean up levels for BTEX compounds, but not for TPH-G. TPH-G has decreased significantly since AS/SVE system startup in November 2011 (see Figure 4-6c). However, additional data is necessary to determine if the concentration trend is due to seasonal variability in water column or effective remediation by the AS/SVE system.
- TPH-G and BTEX concentrations are below MTCA cleanup levels at wells 95-A17-2, 95-A17-4, and 07-A17-7.
- Well 10-A17-8 is nearest to the petroleum contamination source and registers the highest concentrations of TPH-G and BTEX. Concentrations of TPH-G have greatly decreased since AS/SVE system startup in May 2012 (see Figure 4-6g). Concentrations of BTEX have also decreased since 2012, and currently only benzene levels are above the cleanup criteria (see Figure 4-6h).

Figure 4-6a - TPH-G Trend for 95-A17-2 (AOC 9-2)

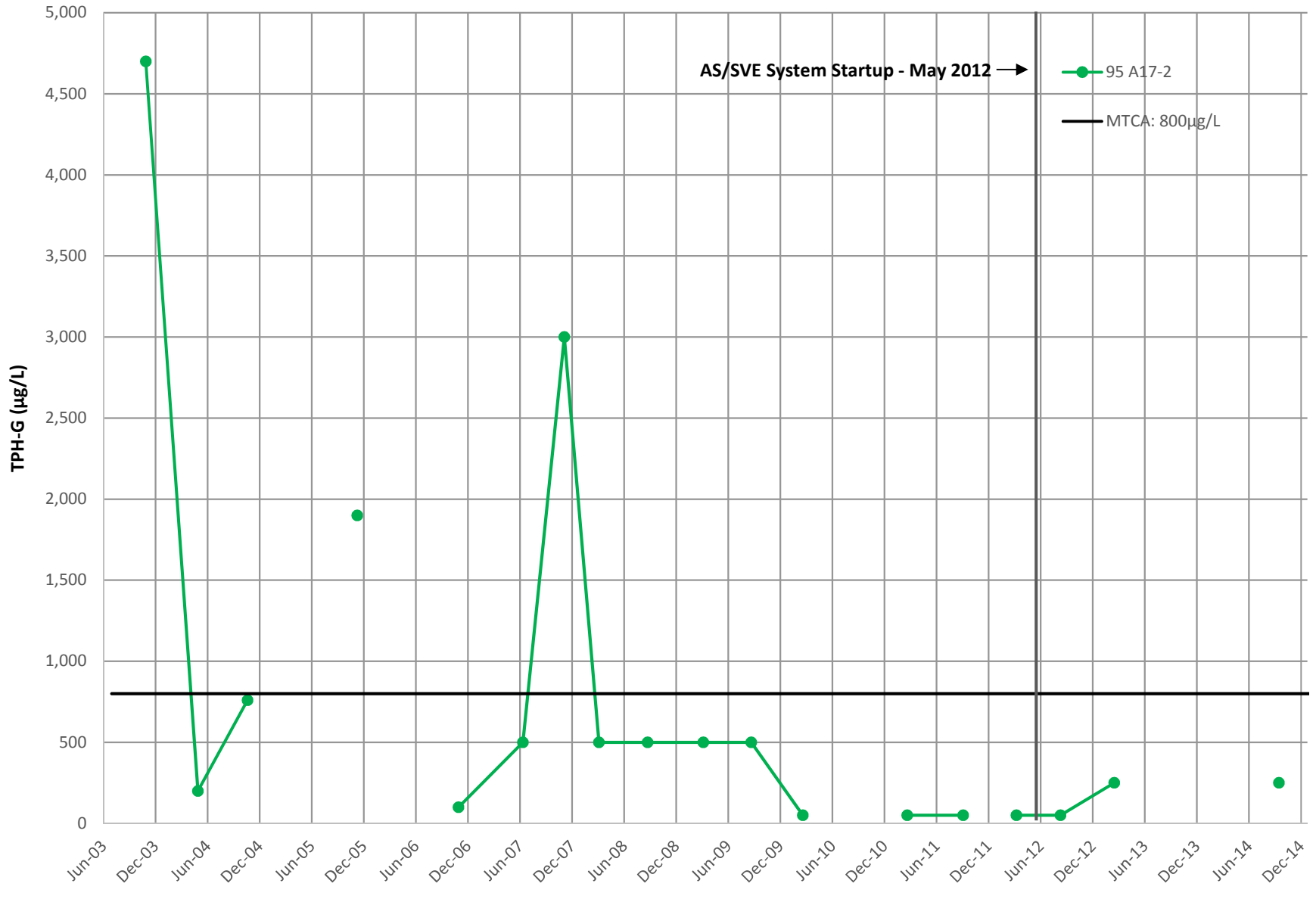


Figure 4-6b - Benzene Trend for 95-A17-2 (AOC 9-2)

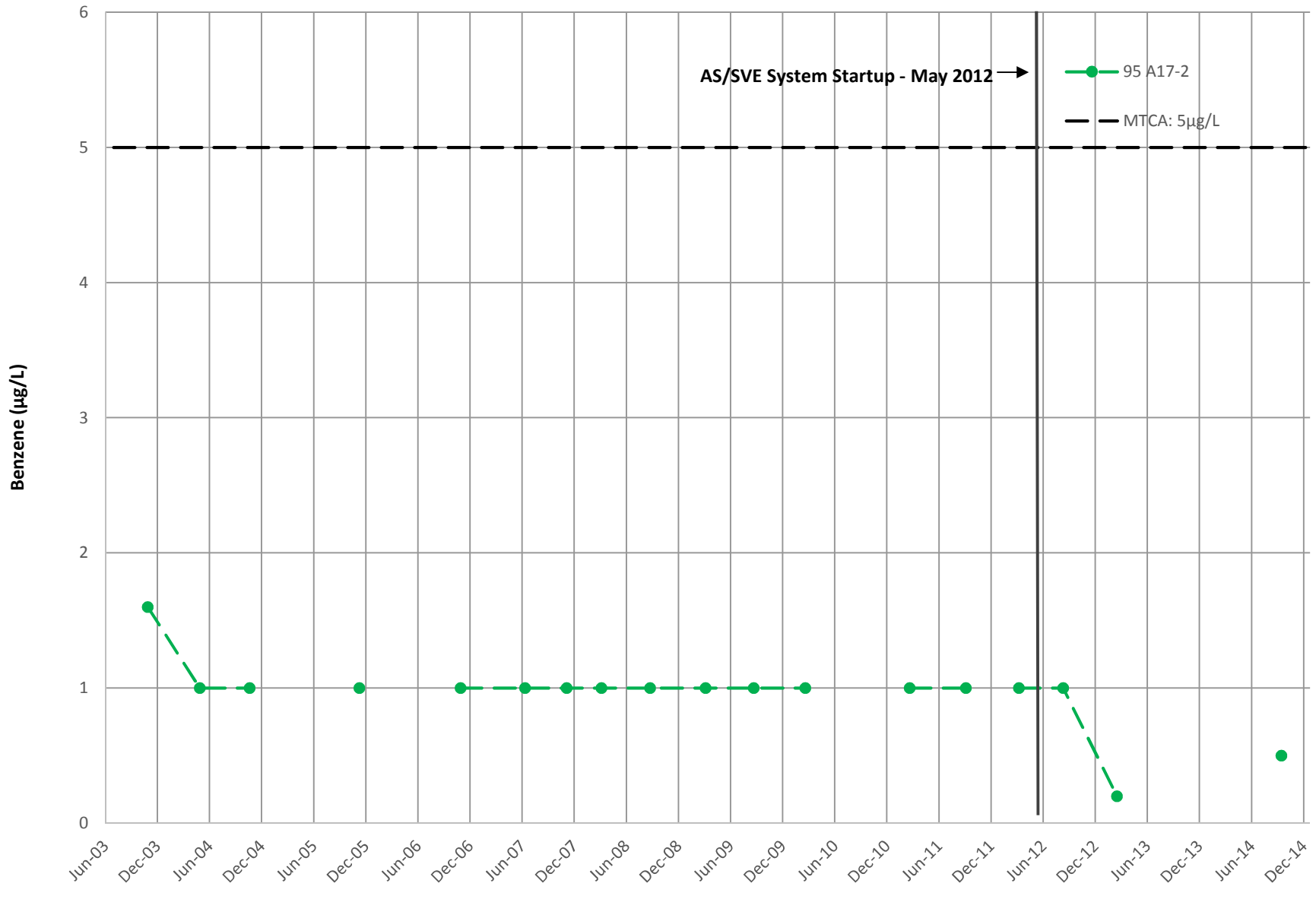


Figure 4-6c - TPH-G Trend for 95-A17-3A (AOC 9-2)

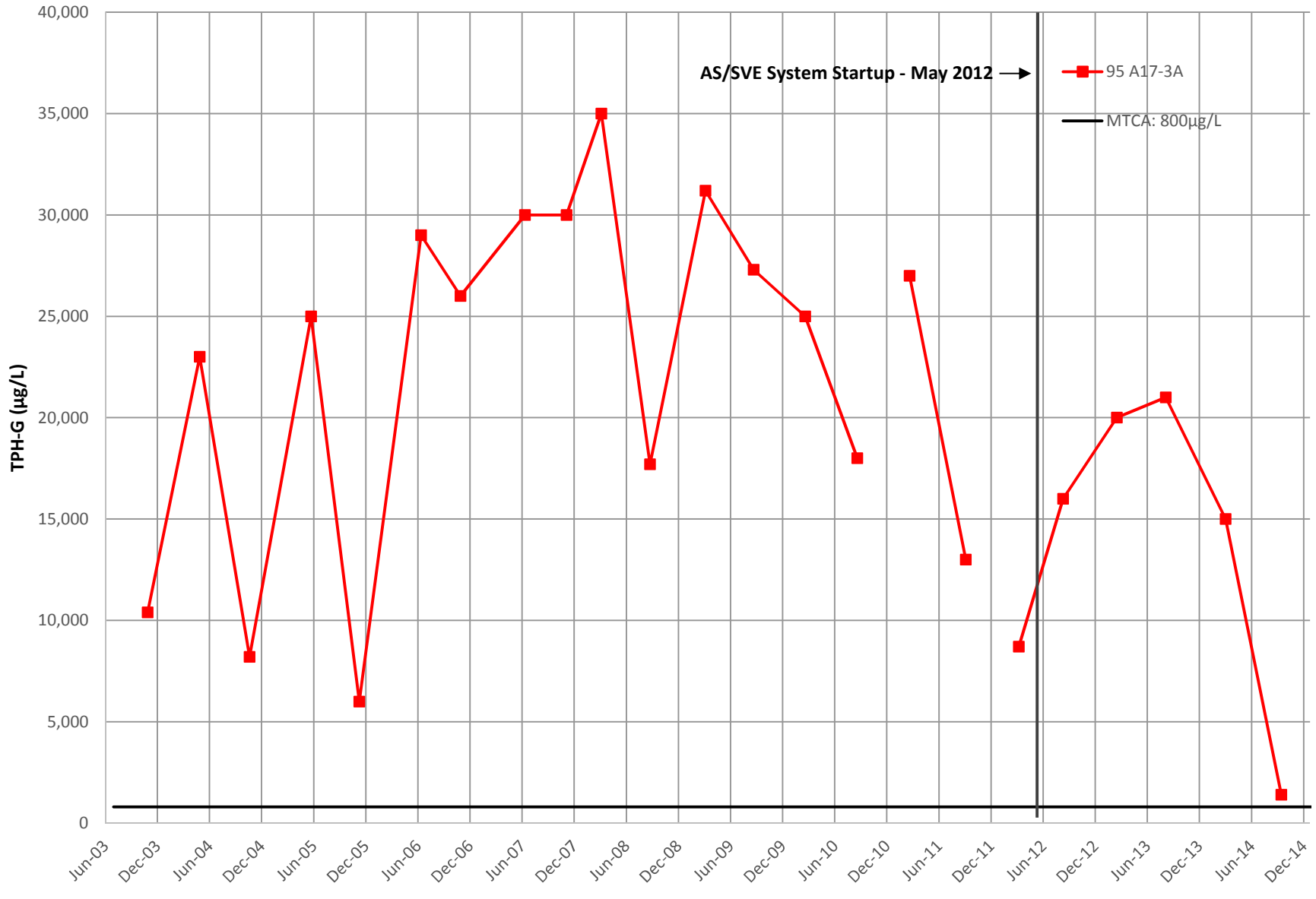


Figure 4-6d - Benzene Trend for 95-A17-3A (AOC 9-2)

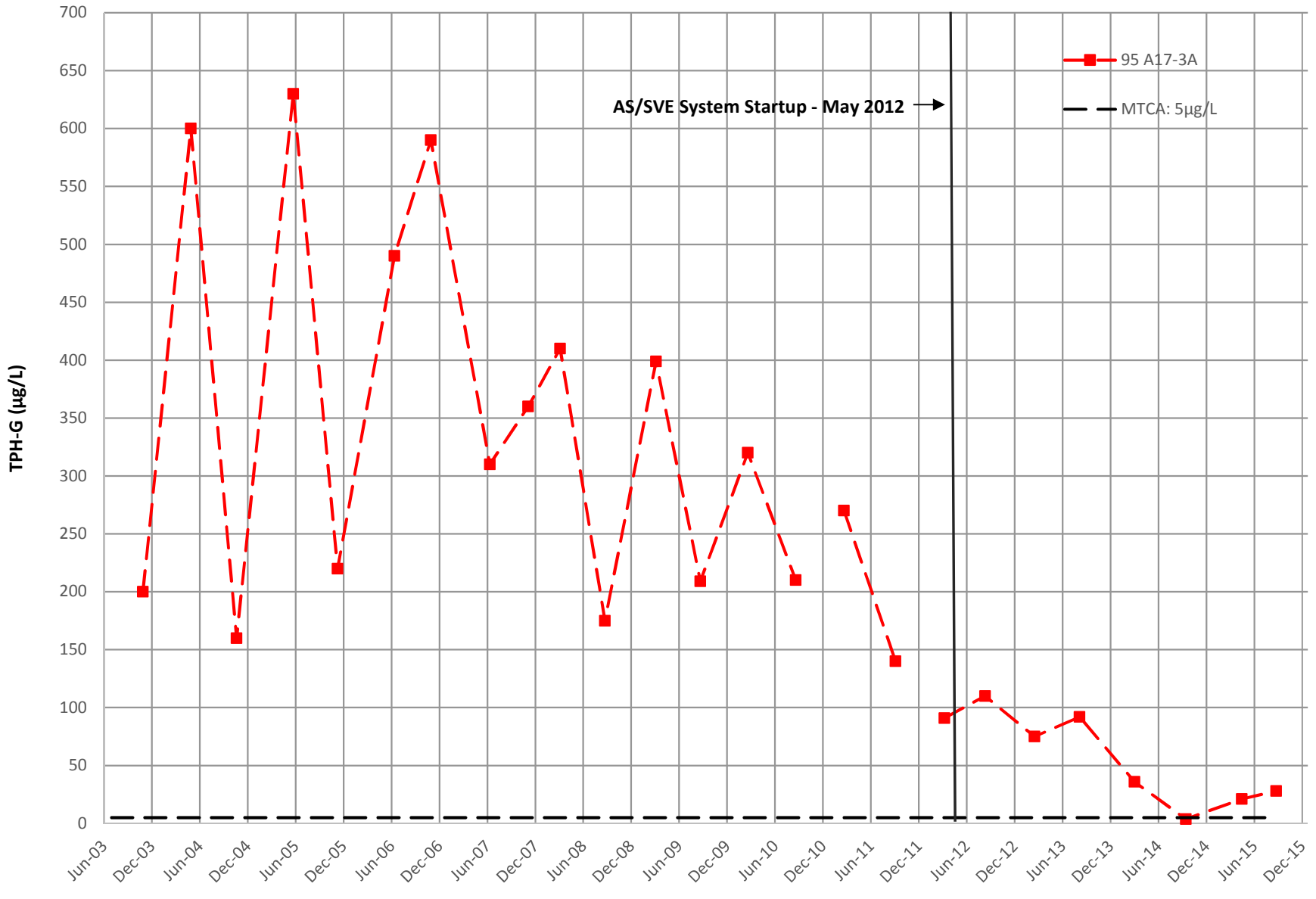


Figure 4-6e - TPH-G Trend for 07-A17-7 (AOC 9-2)

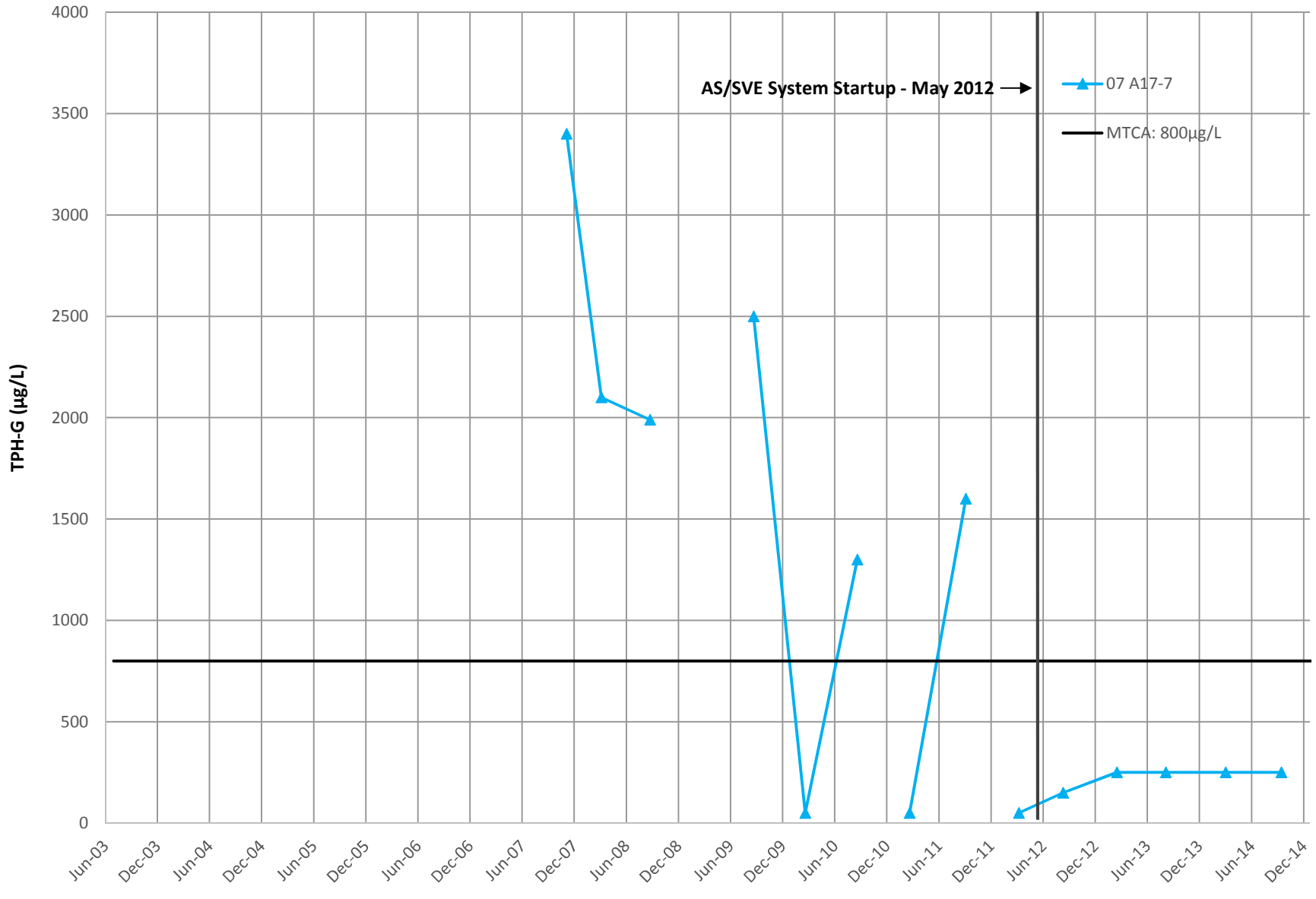


Figure 4-6f - Benzene Trend for 07-A17-7 (AOC 9-2)

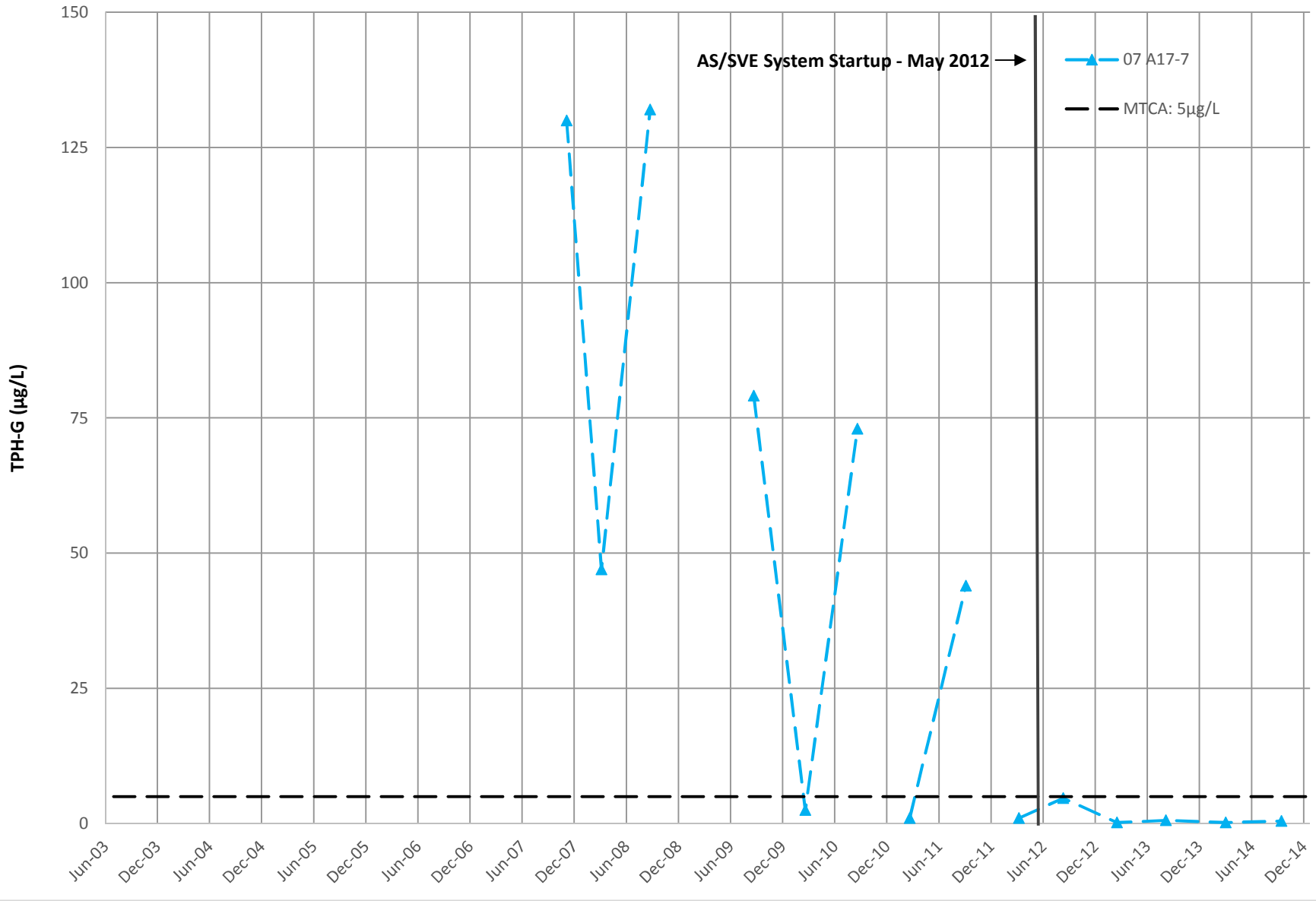


Figure 4-6g - TPH-G Trend for 10-A17-8 (AOC 9-2)

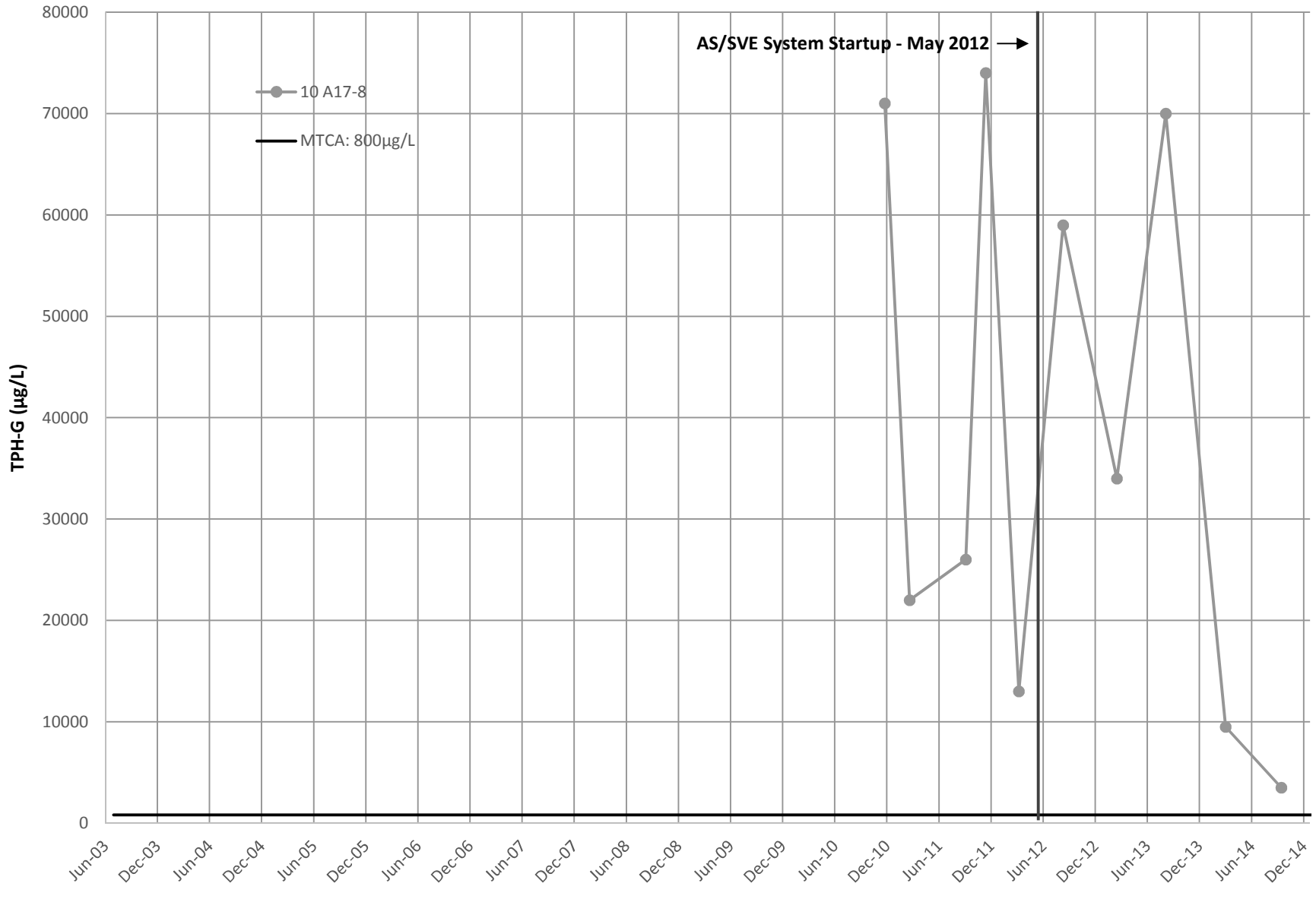
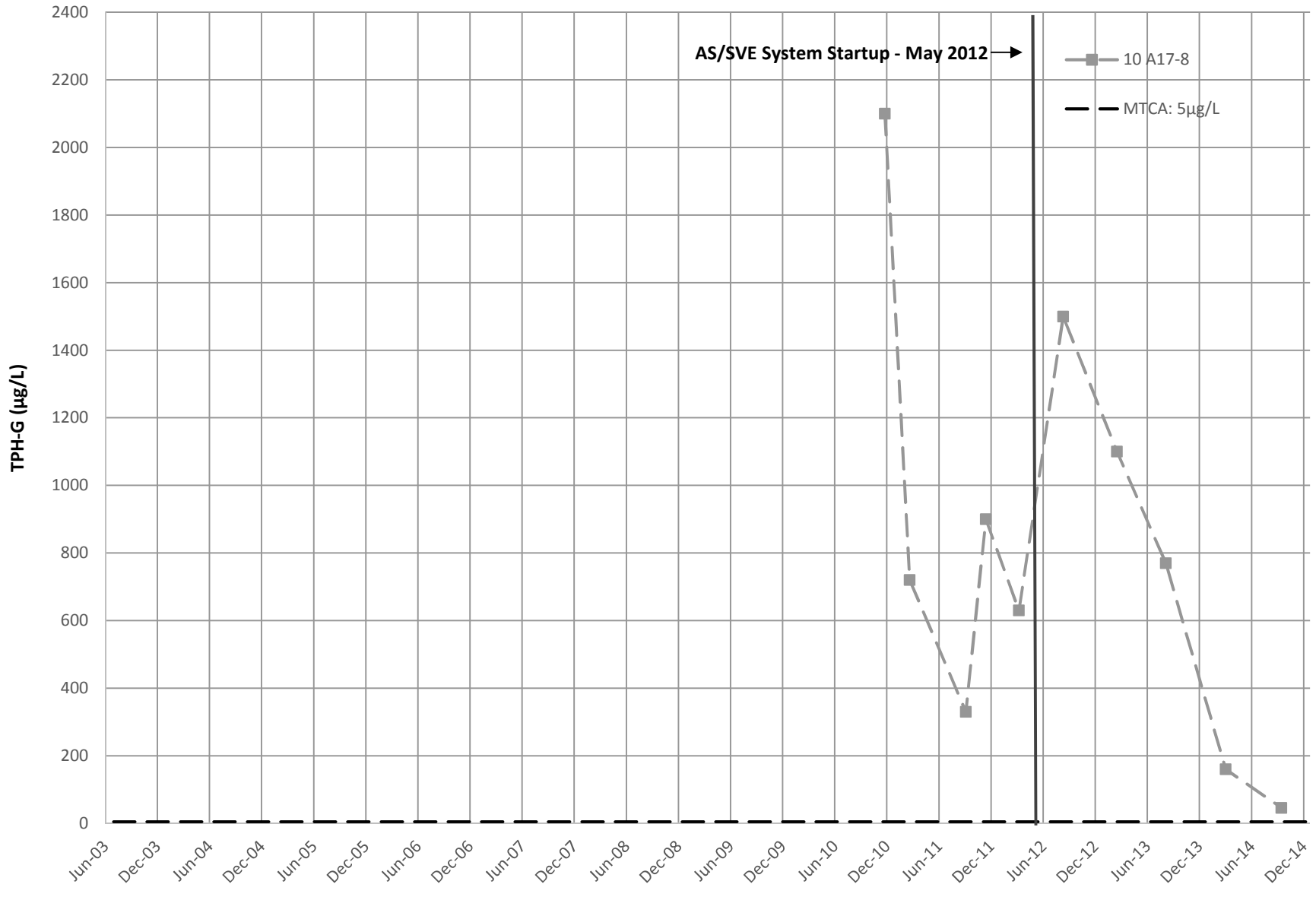


Figure 4-6h - Benzene Trend for 10-A17-8 (AOC 9-2)



5 VAPOR INTRUSION AND AMBIENT AIR MONITORING

Vapor intrusion monitoring is conducted to confirm that VOCs concentrations associated with onsite residual contamination above regulatory criteria are not migrating into the Credit Union building. Ambient air monitoring is used to assess ambient air quality in areas outside the influences of the SVE system and to help determine if other nearby sources may be impacting the air quality within the Credit Union building.

Vapor intrusion monitoring was conducted on November 6, 2014. Samples were collected using 6-liter Summa canisters (Selected Ion Mode [SIM] certified) equipped with vacuum gauges and calibrated flow regulators. Time-integrated samples were collected for 8 hours from all indoor locations. Summa canisters for indoor air sampling were placed at:

- The Credit Union lobby;
- The Credit Union custodian's closet, located in the north wing of the building. The custodian's closet is the area with the most floor penetrations nearest to the source area. The door to the closet was closed to allow for the most conservative (highest concentration) vapor collection; and
- The Credit Union conference room. The conference room is the largest room in the Credit Union building. The southeast corner of the conference room overlies the former UST area.

No modifications were made to HVAC settings, door positions, use, or activities of building personnel or customers. Additionally, automatic metered room deodorizers were turned off 24 hours before sampling and remained off through the duration of the sampling events. The deodorizer system is suspected of interfering with the VOC results for the air samples.

Ambient air samples were collected concurrently at:

- South edge of the Credit Union property, on the boundary of the parking lot at the adjacent fueling station and mini-mall. An 8-hour, time-integrated sample was collected at this location.
- West edge of the Credit Union property, on the boundary of the parking lot at the adjacent Fire Station. This sampling location was defined as the upwind direction in the KTA Sampling and Analysis Plan (KTA 2011). An 8-hour time-integrated sample was collected at this location.

- Air intake to HVAC system at the west side of the building. This canister was placed at the elevation of the air intake on top of the cage that protects the building heat pumps. An 8-hour, time-integrated sample was collected at this location at the height of the air intake.

Weather conditions were recorded for the period around each monitoring event. Field readings include temperature, barometric pressure, and relative wind speed.

All samples were sent to Eurofins-Air Toxics of Folsom, California for analysis by Modified Method TO-15 (full scan/SIM) for TPH-G and BTEX. Sampling location are shown on Figure 5-1.

5.1 VAPOR INTRUSION MONITORING RESULTS

Results of vapor intrusion monitoring using Summa canisters are listed in Table 5-1. Table 5-1 compares detected concentrations of gasoline-type VOCs to Ecology Cleanup Levels and Risk Calculation (CLARC) database, MTCA Method B Cleanup Levels for carcinogens and non-carcinogen compounds.

Laboratory reports for air sample analysis are contained in Appendix D.

Analyses of ambient air samples, collected near the fire department (AOC92120209 FD) and the HVAC intake (AOC92120209 Supply) were non-detect for TPH-G. However, the samples collected from the south parking lot location (AOC92120209 AAFES) contained 72.0 µg/m^3 of TPH-G. This location is adjacent to a public gas station. Samples collected inside the Credit Union building were non-detect for TPH-G.

The carcinogenic cleanup level of 0.32 µg/m^3 benzene was exceeded at all sample points inside the building. Elevated concentrations of benzene were observed in the three building interior samples collected (lobby, conference room, and custodian's closet) and ranged in concentration from at 0.42 µg/m^3 to 0.44 µg/m^3 (see Table 5-1). However, the ambient air sample collected at the intake for the building HVAC system and an ambient air sample collected from the south parking lot near the AAFES Gas Station contained benzene above MTCA Method B carcinogen cleanup level for benzene at 0.39 µg/m^3 and 0.84 µg/m^3 respectively. These results indicate the gas station as a potential source for the elevated benzene concentration detected in the indoor air at the Credit Union building.

Additional testing may be necessary to try to determine the actual source of the benzene detected in indoor air.

5.2 QUALITY ASSURANCE/QUALITY CONTROL REVIEW AND VERIFICATION

Data quality was reviewed and verified by Sealaska personnel to determine if the data is suitable for use. Project data as well as Quality Assurance/Quality Control data (i.e., field quality control results, lab quality control results, PQLs, and holding times) were evaluated in terms of precision, accuracy, representativeness, comparability, and completeness. No corrective action for field or laboratory data was required.

5.3 COMPARISON TO 2012 DATA

The initial round of vapor intrusion monitoring was conducted in 2012 after startup of the AS/SVE system (Versar 2013b). A comparison of 2012 and 2014 monitoring results is provided in Table 5-2.

The vapor intrusion monitoring data shows a marked decrease from 2012 to 2014 in both TPH-G and BTEX concentrations in samples collected in the Credit Union building and in ambient air. The 2012 TPH-G results for samples collected inside the Credit Union building may have been impacted by a room deodorizer (Versar 2013b). A sample collected from the deodorizer indicated concentrations of several VOCs. However, the net effect of deodorizer on the overall TPH-G concentration was not quantified. In 2014, the deodorizer was turned off 24 hours prior to sampling.

Table 5-1. 2014 Results of Vapor Intrusion Monitoring at AOC 9-2

Lab Sample ID	Summa Canister Number	Sealaska Sample ID	Sampling Location	Date	TPH-G (µg/m³)	Benzene (µg/m³)	Toluene (µg/m³)	Ethyl-benzene (µg/m³)	Total Xylenes (µg/m³)[1/]
1411121-06A	35978	AOC92120209 Supply	Ambient - HVAC Intake	11/06/14	ND	**0.39**	1.2	0.15	0.91
1411121-01A	35974	AOC92141106 Conf	Conference Room	11/06/14	ND	**0.44**	1.6	0.18	1.05
1411121-02A	5698	AOC92141106 Cust	Custodian Closet	11/06/14	ND	**0.42**	2.8	0.26	1.1
1411121-04A	35976	AOC92120209 AAFES	Ambient - AAFES	11/06/14	72	**0.84**	4.8	0.6	3.76
141121-05A	5792	AOC92120209 FD	Ambient - Fire Dept.	11/06/14	ND	**0.20**	0.36	0.074	0.189
1411121-03A	74340	AOC92120209 Lobby	Lobby	11/06/14	ND	**0.43**	1.9	0.23	1.19
MTCA Method B Carcinogen Cleanup Level					NA	0.32	NA	NA	NA
MTCA Method B Non-Carcinogen Cleanup Level					NA	14	2,300	460	46

Notes:
[1/] Total xylenes are calculated from sum of m,p- and o-xylenes.
Bold – exceeds cleanup level
ND – Not Detected
NA – Not Applicable

Table 5-2. Comparison of 2012 and 2014 Vapor Intrusion Monitoring Results

	TPH-G (µg/m³)		Benzene (µg/m³)		Toluene (µg/m³)		Ethylbenzene (µg/m³)		Total Xylenes (µg/m³)[1]	
Sampling Location	**2012**	**2014**	**2012**	**2014**	**2012**	**2014**	**2012**	**2014**	**2012**	**2014**
Ambient - HVAC Intake	98	ND	1.3	0.39	3.1	1.2	0.51	0.15	2.6	0.91
Conference Room	360	ND	1.8	0.44	9.4	1.6	1.0	0.18	4.9	1.05
Custodian Closet	410	ND	1.9	0.42	9.6	2.8	1.0	0.26	4.6	1.1
Ambient - AAFES	170	72	2.0	0.84	7.1	4.8	0.99	0.6	4.6	3.76
Ambient - Fire Dept.	140	ND	1.7	0.20	5.6	0.36	0.82	0.074	3.8	0.189
Lobby	34	ND	1.9	0.43	7.3	1.9	0.98	0.23	4.5	1.19

Notes:
The 2012 TPH-G concentrations for non-ambient samples may have been affected by a building deodorizer. The amount of the impact and what analytes were impacted is not known.
[1/] Total xylenes are calculated from sum of m,p- and o-xylenes
ND – Not Detected

Legend

- Vapor Intrusion Monitoring Location
- Soil Vapor Probe
- Vacuum Port
- Monitoring Well

0 10 20 40
Feet

N

Map Data:
Coordinate System: UTM, Zone 10
Horizontal Datum: WGS 84

USACE

SEALASKA

Figure 5-1
Vapor Intrusion
Monitoring Locations

Path: P:\Production\Fig\JBLM\TO 01A\Credit Union\O&M Report - 2015\Maps\SVE_Fig_5-1_VprIntrMonitoringLoc.mxd
Date: 10/6/2015

6 DEVIATIONS FROM INTERIM ACTION WORKPLAN

The following section provided a list of deviations from the requirements of the Final Interim Action Workplan (Versar 2013a) for both compliance monitoring and vapor intrusion monitoring. Deviations related to groundwater monitoring are presented in the Draft Final Fort Lewis Agreed Order (FLAO) Groundwater Monitoring Report (Sealaska 2015).

6.1 PERFORMANCE MONITORING

Performance monitoring was completed in general accordance with the Workplan. Deviations included:

- Vapor samples from the AS/SVE system exhaust were collected semi-annually versus the quarterly monitoring indicated in the Workplan. This was an error and is being corrected in 2015. To ensure concentration of VOCs exceeding air discharge criteria are not released to the atmosphere in the future, a granular activated carbon scrubber was installed in 2015 on the SVE system after the blower and prior to discharging the extracted air to the atmosphere.
- The vapor monitoring and the collection of pressure measurements was not completed at the SVPs in 2014 due to an oversight. However, sub-slab pressure was monitored weekly as described in Section 3.3 to ensure negative pressure was maintained beneath the Credit Union building and throughout the system.

6.2 VAPOR INTRUSION MONITORING

Vapor intrusion monitoring was completed in accordance with the Workplan.

7 CONCLUSIONS

Mechanically, the AS/SVE system is functioning as designed. Sparge cycles are evidenced by the groundwater mounding effect at monitoring wells around the contaminant plume.

Current observations related to groundwater and the success of remedial action include:

- Well 95-A17-3A is below MTCA clean up levels for BTEX compounds, but not for TPH-G. TPH-G has decreased significantly since AS/SVE system startup in November 2011. However, additional data is necessary to determine if the concentration trend is due to seasonal variability in water column or effective remediation by the AS/SVE system. Continued monitoring is recommended to compile sufficient data to allow for a valid statistical evaluation of remediation progress.
- TPH-G and BTEX concentrations are below MTCA clean up levels at well 07-A17-7. Concentrations of analytes have been near the PQL and below MTCA since 2012.
- Well 10-A17-8 is nearest to the petroleum contamination source and registers the highest concentrations of TPH-G and BTEX. TPH-G and benzene remain above cleanup levels. However, since system startup TPH-G and benzene have declined.

Although TPH-G and BTEX concentrations have decreased at some wells, continued monitoring of groundwater is needed to verify that remediation is taking place and that the decreases are not due to seasonal variability.

Analysis of the SVE exhaust verified that VOCs are being extracted. Results of SVE blower exhaust monitoring in 2014 indicate benzene emissions of less than 0.01 pounds/year and total VOC emissions of less than 10 pounds/year.

Results of vapor intrusion monitoring indicate air concentrations of TPH-G, toluene, ethylbenzene, and xylenes are within MTCA Method B carcinogen and non-carcinogen cleanup levels (see Table 5-1).

Benzene concentrations in air samples collected from within the Credit Union building were slightly above MTCA Method B carcinogen cleanup levels. Elevated concentrations of benzene were observed in the three building interior samples collected (lobby, conference room, and custodian’s closet). However, the ambient air sample collected at the intake for the building HVAC system and an ambient air sample collected from the south parking lot

near the AAFES Gas Station also contained benzene in excess of the MTCA Method B carcinogen cleanup level. These results indicate the gas station as a potential source for the elevated benzene concentration detected in the indoor air at the Credit Union building.

Additional testing may be necessary to try to determine the actual source of the benzene.

8 RECOMMENDATIONS

Weekly, monthly, semi-annual, and annual monitoring and/or sampling events should continue in order to evaluate system operation and remediation progress. Additional information on system monitoring and sampling is provided in the Interim Action Workplan (Versar 2013a) and not in this report. The O&M manual replacing the Interim Action Workplan is currently in review by Ecology.

It is recommended to reduce monitoring of activities that are not critical for system operations. Temperatures, pressures, and flow rates measurements have been conducted on a weekly basis since system startup and are shown to be stable with little to no critical variations. It is recommended that measurement of temperatures, pressures, and flow rates for the AS/SVE system be reduced to once a quarter instead of weekly. Weekly site maintenance visits should continue.

Although emissions from the SVE blower exhaust are low, it is recommended that a granular activated carbon filter be installed on the SVE blower exhaust. Additionally, the discharge point for the system exhaust should be raised above the roof line of the equipment shed as the vapors are currently released at a level that puts them in the breathing zone of people in the area. Although emissions from the exhaust are below requirements, these two revisions to the SVE exhaust system would help decrease the potential for fuel odor from the exhaust at times when spikes in contaminant concentrations may occur. With the installation of the carbon filter, exhaust monitoring would also be reduced to quarterly. PID readings would indicate when carbon change out is required.

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APPENDIX A

FIELD DOCUMENTATION

AOC 9-2 America's Credit Union, North Fort, Joint Base Lewis-McChord

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: TOM MALAMAKAL					**Day/Date:** 12/24/2014	
Weather Condition: (temp, barometer, wind, etc)						
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 600, 1200, 1810, 2400				**Time Off:** 630, 1230, 1830, 0030	
AS Blower Vault	12:45	100%	—	~~1948.8~~	~~17~~ 14	
Air Sparge Wells						
11574-ASW-1	12:44	100%	—	114	~~2.5~~ 17	
11574-ASW-2	12:39	100%	—	66.1	~~8~~ 12	
Extraction Blower Suction						
11574-SVE-BS-1	12:12	75%	36.6	52.1	2.5	
11574-SVE-BS-2	12:12	100%	38.0	54.6	8	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	54.5	76.3	**VOCs by PID** (ppbv/ppmv)[d] 24	0 PPB @ FIRST PARKING STALL NEXT TO SV12 MED.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.025	0.03	0.03	0.035	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

A-1

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom MALAMAKAL					**Day/Date:** 12/12/2014	
Weather Condition: (temp, barometer, wind, etc)	52° F, 29.86 in, WIND 5 8 MPH, PARTLY SUNNY.					
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0600, 1200, 1800, 2400			**Time Off:** 0630, 1230, 1830, 0030		
AS Blower Vault	1340	100%	—	68.3	17	
Air Sparge Wells						
11574-ASW-1	1342	100%	—	49.9	6	
11574-ASW-2	1333	100%	—	66.1	5	
Extraction Blower Suction						
11574-SVE-BS-1	1309	75%	24.4	56.5	2.5	
11574-SVE-BS-2	1309	100%	36.5	57.6	8	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	55.4	86.6	**VOCs by PID** (ppbv/ppmv)[d] 2-24 ppb	0 PPB @ FIRST PARKING STALL NEXT TO SVE SHED.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.03	0.025	0.03	~~0.025~~ (IN) 0.03	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

KO DRUM DRAINED FOR greater than 5 MIN. (1/2 FULL)

Signature:

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: TOM MALAMAKAL						**Day/Date:** 12/5/2014
Weather Condition: (temp, barometer, wind, etc)		45°F, 29.97 in, WIND: WSW 1 MPH, SHOWERS.				
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 600, 1200, 1800, 2400				**Time Off:** 630, 1230, 1830, 0030	
AS Blower Vault	1104	100	—	55.5	16	
Air Sparge Wells						
11574-ASW-1	11:05	100	—	45.4	1	
11574-ASW-2	10:58	100	—	64.4	1	
Extraction Blower Suction						
11574-SVE-BS-1	1040	75	27.9	52.4	2.5	LEAKY VALVE
11574-SVE-BS-2	1040	100	34.6	55.7	7.5	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	54.2	77	**VOCs by PID** (ppbv/ppmv)[d] 21	25 MPB @ FIRST PARKING STALL NEXT TO SVE SHED.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.025	0.025	0.03	0.035	0.01

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

KO DRUM ALMOST 1/2 FULL

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom MALAMAKAL, Bob THOMAS						**Day/Date:** 11/26/2014
Weather Condition: (temp, barometer, wind, etc)		59° F, 30.09 in, WIND: S 8MPH, CLOUDY				
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ (°F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0:00, 6:00, 12:00, 18:00				**Time Off:** 0:30, 6:30, 12:30, 18:30	
AS Blower Vault	14:20	100	—	66.6	17	
Air Sparge Wells				57.8		
11574-ASW-1	14:24	100	—	~~65.8~~	~~2~~ 2	
11574-ASW-2	14:14	100	—	65.8	2	
Extraction Blower Suction						
11574-SVE-BS-1	14:00	75%	33.3	57.6	2.5	LEAKING
11574-SVE-BS-2	14:00	100%	36.2	58.8	7.5	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.9	81.7	**VOCs by PID** (ppbv/ppmv)[d] 20-78	0-14 PPB @ FIRST PARKING STALL NEXT TO SVE SHED.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.03	0.03	0.03	0.03	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom MALAMATICAL						**Day/Date:** 11/17/2014
Weather Condition: (temp, barometer, wind, etc)			34°F, 30.39 in, WIND 0 MPH, SUNNY			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0500, 1100, 1700, 2300				**Time Off:** 0530, 1130, 1730, 2330	
AS Blower Vault	10:40	100	—	54.3	17	
Air Sparge Wells						
11574-ASW-1	10:47	100	—	46.6	1	
11574-ASW-2	10:38	100	—	64.4	0	
Extraction Blower Suction						
11574-SVE-BS-1	10:58	75	30.3	53.7	2.5	leaky.
11574-SVE-BS-2	10:58	100	37.7	51.2	8.0	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	50.5	80.0	**VOCs by PID** (ppbv/ppmv)[d] M ppb	AT FIRST APPROACH STILL NEXT TO SVE SITED ~20 ppb.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.025	0.025	0.030	0.035	0.01	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

VOC conc around ACV higher than normal ~ 10 – 20 ppb.

11/18/14 BOB THOMAS DRAINED KO DRUM ~ 1/2 FULL ~ 1140 AM

Signature: Tom Malamatical for Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: TOM MALAMAKAL						**Day/Date:** 11/10/2014
Weather Condition: (temp, barometer, wind, etc)			48°F, 30.22in, WIND: N 13 MPH, AT 82%, MOSTLY SUNNY.			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/°F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** ~~0530, 1100, 1700, 2300~~				**Time Off:** ~~0630, 1230, 1830, 0030~~	
AS Blower Vault	11:45	100%	—	113	16.5	AS shut off @ 11:30
Air Sparge Wells						
11574-ASW-1	11:46	100%	—	58.6	14	AS shut off @ 11:30
11574-ASW-2	10:56	100%	—	66.6	1	
Extraction Blower Suction						
11574-SVE-BS-1	10:40	75%	30.7	57.6	3.5	
11574-SVE-BS-2	10:41	100%	36.1	57.8	8.0	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.2	88.3	**VOCs by PID** (ppbv/ppmv)[d] 1 ppm	0 PPB ~~AT~~ FIRST PARKING STALL NEXT TO SVE SHED. AFTER SPARGE CYCLE 14 PPB IN FIRST PARKING STALL NEXT TO SVE SHED, ~ 20 PPB AT BLOWER EXHAUST.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.015	0.01	0.035	0.035	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

SVE SAMPLING EVENT

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS + TOM MALIAMAKAL					**Day/Date:**	11/4/2014
Weather Condition: (temp, barometer, wind, etc)	57°F, 30.12 in, WIND: S 14 MPH, DRIZZLE, CLOUDY.					
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/°F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments** SPARGE BLOWER NOT SET FOR STANDARD TIME
Air Sparge Blower	**Time On:** 24:00, 0600, 1200, 1800			**Time Off:** 24:30, 0630, 1230, 1830		set on 4 30 min cycles.
AS Blower Vault	13:19	100%	—	69.9	14	
Air Sparge Wells						
11574-ASW-1	13:06	100 %	—	57.6	14	
11574-ASW-2	13:06	100 %	—	57.2	1	
Extraction Blower Suction						
11574-SVE-BS-1	10:20	75%	20.2	58.9	3.5	not leaking anymore.
11574-SVE-BS-2	10:20	100%	35.2	59.2	8	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	52.5	81.6	**VOCs by PID** (ppbv/ppmv)[d] 0 ppb.	TEDLAR BAG SAMPLE TAKEN @ 10:00 16ppb @ 15:00 @ extraction blower exhaust 15ppbv @ 1531 @ SVE EXHAUST. 15ppbv @ 1740h

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.03	0.03	0.035	0.035	0.01	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

COLLECTING 4 TEDLAR BAG SAMPLES AND 1 DUPLICATE @ FOUR EQUALLY SPACED INTERVALS OVER 8 HOURS. STARTED @ 10:00 END @ ~18:00.

Signature: Bob Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom MALAMAKAL					**Day/Date:** 10/27/2014
Weather Condition: (temp, barometer, wind, etc)	46° F, 30.16 in, WIND: WSW 2mph, cloudy, no rain.				
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 12:00			**Time Off:** 12:30		
AS Blower Vault	11:28	100	—	68.2	16	
Air Sparge Wells						
11574-ASW-1	11:19	100	—	56.3	1	
11574-ASW-2	11:07	100	—	67.4	1	
Extraction Blower Suction						
11574-SVE-BS-1	10:49	75%	26.0	60.9	1.5	
11574-SVE-BS-2	10:49	100%	35.4	60.9	6.5	
Extraction Blower Exhaust (11574-SVE-BE-1)	10:55	Always 100%	49.8	82.9	**VOCs by PID** (ppbv/ppmv)[d] 4-10 ppb → TOOK READING AGAIN AT 11:00 → 0 ppb.	READING JUMPED BETWEEN 4-10 PPB. 0 PPB AT FIRST PURGING STILL NEXT TO SVE SHED.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.025	0.025	0.03	0.03	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

Signature: [signature]

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: TOM MALAMACKAL					**Day/Date:** 10/22/2014	
Weather Condition: (temp, barometer, wind, etc)	55°F, 29.74 in, WIND: SSE 6 MPH, VERY RAINY (0.6 in), CLOUDY.					
Monitoring Point	**Time** 10:46	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 12:00				**Time Off:** 12:30	
AS Blower Vault	11:30	100	—	66.6	7	
Air Sparge Wells						
11574-ASW-1	11:20	100	—	59.6	1	
11574-ASW-2	11:11	100	—	67.8	0	
Extraction Blower Suction						
11574-SVE-BS-1	10:52	75%	~~56.8~~	56.8	1.5	leaking valve reading 1.5 in before opening valve.
11574-SVE-BS-2	10:52	100%	~~56.8~~ 36.0	56.8	6.5	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	57.2	78.6	**VOCs by PID** (ppbv/ppmv)[d] 0 ppb	0 PPB @ PARKING SPACE PERFECTLY NEXT TO SVE SHED. (AMBIENT READING)

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.03	0.025	0.03	0.045	0.015	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

Signature: Tom Malamackal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom MALAMAKAL					**Day/Date:** 10/14/2014	
Weather Condition: (temp, barometer, wind, etc)		57°F, 29.83 in, WIND: ENE 2 MPH. CLOUDY 40% chance of rain.				
Monitoring Point	**Time** 11:51	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:**				**Time Off:**	
AS Blower Vault	12:30	100	—	140	16	
Air Sparge Wells						
11574-ASW-1	12:20	100	—	65.6	17	
11574-ASW-2	13:00	100	—	67.8	7	
Extraction Blower Suction						
11574-SVE-BS-1	12:00	75%	24.3	69.7	1.5	leaking valve reading @ 1.5 in valve opening valve
11574-SVE-BS-2	12:00	100	36.7	68.2	6.5	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	49.5	91.5	**VOCs by PID** (ppbv/ppmv)[d] 0 ppb	AMBIENT AIR READING TAKEN AT 1ST PARKING SPACE NEXT TO SVE BUILDING 0 PPB.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.025	0.02	0.025	0.03	0.01	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom MALAMAKAL					**Day/Date:** 10/06/2014	
Weather Condition: (temp, barometer, wind, etc)		61° F, 30.09 in, wind: 0 mph sunny and clear				
Monitoring Point	**Time** 11:00	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** ~~12~~:00				**Time Off:** 23:00	
AS Blower Vault	12:06	100	0	70	14	~~pressure~~ flow changed to
Air Sparge Wells						
11574-ASW-1	12:00	100	~~0.5~~ 0	65.8	0.5	
11574-ASW-2	11:40	100	0	66.9	1	
Extraction Blower Suction						
11574-SVE-BS-1	11:30	75%	24.6	76.0	1.5	leaking possibly.
11574-SVE-BS-2	11:31	100%	36.2	70.3	6.5	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.6	99.5	**VOCs by PID** (ppbv/ppmv)[d] 0 ppb	PID calibrated (200 ppm). THERD PARKING SPACE FROM SVE BUILDING (0 PPB) 0 PPB at AIR SPARGE BLOWER

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.02	0.02	0.025	0.035	0.015	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

Signature: B. Thomas for Tom M.

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Tom Malamakal, Bob Thomas						**Day/Date:** 9/29/2014
Weather Condition: (temp, barometer, wind, etc)			cloudy, chance of rain, wind SSW 12 mph Pressure: 29.85 in humidity 80%, 57° F			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10PM				**Time Off:** 11PM AUTO TIMER	
AS Blower Vault	1152	100	OFF	64.8	~~4 psig~~	
Air Sparge Wells						
11574-ASW-1	1148	100	—	64.1	~~0.5~~	NO PROBLEMS NOTED
11574-ASW-2	1145	100	—	68.8	~~0~~	NO PROBLEMS NOTED
Extraction Blower Suction						
11574-SVE-BS-1	11:09	75%	36.4	58.1	3.0	
11574-SVE-BS-2	11:09	100%	32.7	58.4	6.5	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	52.0	71.3	**VOCs by PID** (ppbv/ppmv)[d] 0	1st PARKING BAY NEXT TO SVE BUILDING 0 PPB @ 11:11. 0 PPB @ 11:51 @ blower exhaust 2 PPB @ 11:51 @ 1st parking bay next to SVE building.

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	~~0.03~~	0.03	0.03	0.035	0.015	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Bob Thomas					**Day/Date:** FRI 19 SEPT 2014	
Weather Condition: (temp, barometer, wind, etc) @1432h 74F, 55% Hum, 57°Dewpt, 30.13IN WIND S 5M/H WSW						
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower		**Time On:** 10 PM			**Time Off:** 11 PM	AUTO TIMER
AS Blower Vault	1505	100	—	66.9F	14psig	
Air Sparge Wells		100				
11574-ASW-1	~~1439~~	~~75~~ 100	~~24.1~~	71.6F	0	NO CREDIT UNION INTERLOCK ACCESS TODAY
11574-ASW-2	~~1440~~	~~100~~ 100	33.1	NO ACCESS	—	" " " "
Extraction Blower Suction						
11574-SVE-BS-1	1439	75	24.1	76.3	2.5"	
11574-SVE-BS-2	1440	100	33.1	72.6	6.0"	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.7	106	**VOCs by PID** (ppbv/ppmv)[d]	0 PPBV @ 1436h SVE EXH 0 PPBV @ 1436h @ 1ST BAG BAY

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
1454h	0.01	0.015	0.030	0.020	NOT CHECKED

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

Signature: B Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: TOM MALAMAKAL						Day/Date: FRI 9/12/2014
Weather Condition: (temp, barometer, wind, etc)			sunny, slight breeze, → NNE 14 mph → NNW app 10 mph 75°F 19% RH, 30.00 in			
Monitoring Point	**Time** 15:50	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/(°F)[b])	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 2200			**Time Off:** 2300 AUTO TIMER		
AS Blower Vault	16:28	100	—	68	14	
Air Sparge Wells						
11574-ASW-1	16:24	100	—	71.6	0	
11574-ASW-2	16:24	160	—	67.9	0	
Extraction Blower Suction						
11574-SVE-BS-1	16:01	75%	30.3	69.3	2	SOUTH
11574-SVE-BS-2	16:02	100	28.2	67.5	6	NORTH
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	~~48.~~ 52.1	114.2	**VOCs by PID** (ppbv/ppmv)[d]	Ambient → 15:55 → second parking space from SVE, 0 ppb 16:08 → 0ppb

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.02	0.02	0.03	0.03	0.02

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

access to building indoor by Claire Mancilla, ACU branch manager.

Signature: Tom Malamakal

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Bob Thomas						**Day/Date:** Mon 8 Sept 2014
Weather Condition: (temp, barometer, wind, etc)			57F @ 1046, cloudy 88% hum, 55°F dew pt 29.93 IN (from NWS app) ; Breeze : 1.4 m/s SW			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10AM				**Time Off:** 11AM	(TIMER SETTING)
AS Blower Vault	1114	100	—	69.7	14 psig	
Air Sparge Wells						
11574-ASW-1	1109	100	—	69.2	0	
11574-ASW-2	1103	100	—	70.3F	0	@1103
Extraction Blower Suction						
11574-SVE-BS-1	1118	75	12.2	69.3F	4 in w/c	
11574-SVE-BS-2	1120	100	34.8	69.3F	7 in w/c	
Extraction Blower Exhaust (11574-SVE-BE-1) 1121h	Always 100%		51.6	89.8	**VOCs by PID** (ppbv/ppmv)[d]	0 PPBV @ 2ND PKG BAY, 1048h 0 PPBV @ SVE EXH @ 1050h 0 PPBV @ SVE EXH @ 1114h
Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
1055 —	0.030	0.020	0.040	0.030	0.015	⇨ 1059h
Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc. VERIFIED BLOWER TIMER SETTINGS.						
				Signature: J. Thomas		

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Bob / Thomas					Day/Date: FRI 29 AUG 2014	
Weather Condition: (temp, barometer, wind, etc)	71F, CLOUDY/LIGHT RAIN, 56% HUM, WIND: 3.4 MI/S, 29.99 IN (VIA WEATHER CHANNEL)					
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10 - PM				**Time Off:** 11 - PM (TIMER)	
AS Blower Vault	1602	100	0	72.1	14 psig	
Air Sparge Wells						
11574-ASW-1	1600	100	—	73.9	0 psig	
11574-ASW-2	1558	100	—	70.8 F	0 psig	
Extraction Blower Suction						
11574-SVE-BS-1		75	4.6	68.6	4 in	
11574-SVE-BS-2		100	33.3	67.9	7.5 in	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	50.4	85.6	**VOCs by PID** (ppbv/ppmv)[d]	48.0 ppbv @ 1620 0 ppbv @ 1626 0 ppbv @ 1632

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
1555 - 1615	0.015	0.025	0.030	0.025	0.025

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

ACCESS TO INSIDE SSD / ASW-2 PROVIDED BY CLAIR, ACU BRANCH MGR

48 ppbv may be remnant of calibration/startup ANALYZER BURN-OFF.

-parking: 1ST BAY @ SVE: 0 ppbv @ 1633

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: JAMES GUZMAN, KATHY LESTER, BOB THOMAS						**Day/Date:** TUES 19 AUG 2014
Weather Condition: (temp, barometer, wind, etc)			WIND: 4.5 m/s; 29.81 BAROMETER @			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10 AM			**Time Off:** 11 AM		
AS Blower Vault				71.7F	13 psig	
Air Sparge Wells						
11574-ASW-1	1623	100	—	79.6	~0.5 psig	
11574-ASW-2		100	—	78.4	0 psig	
Extraction Blower Suction						
11574-SVE-BS-1	1607	75	12	76.5F	*	
11574-SVE-BS-2	1607	100	31	76.5F	*	
Extraction Blower Exhaust (11574-SVE-BE-1) 1606h		Always 100%	47	112F	**VOCs by PID** (ppbv/ppmv)[d]	0 @ 1605h 0 @ 1613 UNDER AWNINGS 0 @ 1619 @ NO. WALL OF BLDG

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.02	0.035	0.03	0.025	0.02

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

* 6 GAUGES UNRELIABLE PID IN

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Kathy Lester						**Day/Date:** Tue 8/12/14
Weather Condition: (temp, barometer, wind, etc) 80°, 29.86, 9mph						
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10 PM				**Time Off:** 11 pm	auto Timer setting
AS Blower Vault	1523	100%	NA	24°C	14	blower off
Air Sparge Wells			8/12/14			
11574-ASW-1	1527	100%	~~16.9~~ NA	*	0	blowers off
11574-ASW-2	1537	100%	NA	*	0	blower off
Extraction Blower Suction						
11574-SVE-BS-1		75%	16.9	*	+	
11574-SVE-BS-2		100%	27.4	*	+	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	52.1	*	**VOCs by PID** 0 (ppbv/ppmv)[d]	@14:58 Time of 1st reading (0) @1545 : 0ppb

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.030	0.020	0.025	0.025	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

*: thermometer broken

+: replace guages with pressure cap

Signature: Kathy Lester

Notes:

a: Identify phase of testing, AS and SVE valve positions, etc.;

b: Identify temperature units.

c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).

d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS, JAMES GUZMAN SCOTT ELKIN						**Day/Date:** TUES 5 AUG 2014
Weather Condition: (temp, barometer, wind, etc)			LIGHT BREEZE SW; 79F 30.05 BAROM.			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10 PM			**Time Off:** 11 PM		
AS Blower Vault		100	—	—	—	
Air Sparge Wells						
11574-ASW-1		100	—		0	
11574-ASW-2		100	—	76.6F	0	
Extraction Blower Suction						
11574-SVE-BS-1	1622	75%	11.0		0	
11574-SVE-BS-2	1621	100%	30.0		7	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	48.5		**VOCs by PID** 50 (ppbv/ppmv)[d]	

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
1605 – 1648	0.035	0.035	0.030	0.035	0.020

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

both blower suction pressure guages not working properly

Signature: B Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS, KATHY LESTER, JAMES GUZMAN						Day/Date: WEDS 30 JULY 2014
Weather Condition: (temp, barometer, wind, etc)			CLOUDY, 59 F, LIGHT BREEZE FROM SW. 30.06 BAROMETER VIA JAMES INTERNET			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 10 PM NIGHTLY			**Time Off:** 11 PM NIGHTLY		
AS Blower Vault		100	—	—	15	BLOWER OFF
Air Sparge Wells						
11574-ASW-1		100	—	—	0	BLOWER OFF
11574-ASW-2		100	—	71 F	0	
Extraction Blower Suction						
11574-SVE-BS-1		75	18.3	63.8 F	NOT INDICATING	
11574-SVE-BS-2		100	35.2	64.4 F	6 in W C	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	54.7	83.8 F	**VOCs by PID** (ppbv/ppmv)[d]	46 ppbv @ 08

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
10 15 → 1030	0.025	0.025	0.03	0.03	0.02

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

VERIFIED AS BLOWER TIMER SETTING.

Signature: R. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

AOC 9-2 America's Credit Union, North Fort, Joint Base Lewis-McChord

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						**Day/Date:** THURS. 3 JULY 2014
Weather Condition: (temp, barometer, wind, etc)			61°F, CLOUDY, WIND @ 9 mph			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1000				**Time Off:** 1100	
AS Blower Vault		100	—	220 °F	17 psig	
Air Sparge Wells						
11574-ASW-1	0940	100	—	68.1°F	0.0	@ TIME BLOWER IS OFF
11574-ASW-2	0951	100	—	70.3°F		
Extraction Blower Suction						
11574-SVE-BS-1		75	24.5	67.4°F		
11574-SVE-BS-2		100	28.9	66.3°F		
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	47.3 0.015	89.1 °F	**VOCs by PID** (ppbv/ppmv)[d]	70 ppb @ 1050

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.015	[illegible]	0.020	0.025	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

ISOLATED SVE ZONES ~ 5 MIN EA. DRAINED KO DRUM 0 MIN. DRUM IS DRY.

Signature: [signature]

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB T.						Day/Date: TUES 24-JUN 2014
Weather Condition: (temp, barometer, wind, etc)			CLOUDY, NO BREEZE			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0000				**Time Off:** 0100	
AS Blower Vault						
Air Sparge Wells						
11574-ASW-1	1343	100	0	66.9	20	AS OFF SINCE 0100
11574-ASW-2	1348	100	0	NA	0	COULDN'T GET THERMOM TO WORK @ AS2
Extraction Blower Suction						
11574-SVE-BS-1	1350	75	10.1	68.1		
11574-SVE-BS-2	1351	100	36.7	69.1		
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	50.1 @1349h	97.0F	**VOCs by PID** (ppbv/ppmv)[d]	0ppbv @ 1348h 0ppbv @ 1353h 0ppbv @ 1400h

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
1324 →	0.015	0.015	0.025	0.025	0.020

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

Signature: Bob Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS						Day/Date: TUES 24 JUN 2014
Weather Condition: (temp, barometer, wind, etc) CLOUDY, LIGHT BREEZE FROM SW LIGHT RAIN LAST NIGHT · 68°F @ 1255h						
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments** AS BLOWER SET TO OPERATE BY TIMER. I VERIFIED OPERATIONS
Air Sparge Blower	**Time On:** ~~0000~~				**Time Off:** 0100	
AS Blower Vault	~~1231~~		~~59.8~~			
Air Sparge Wells						
11574-ASW-1		100				
11574-ASW-2		100				
Extraction Blower Suction						
11574-SVE-BS-1	1233	~75	10.2	73.7	2 in WC	
11574-SVE-BS-2	1234	100	34.6	71.9	4 in WC	
Extraction Blower Exhaust (11574-SVE-BE-1) 1235h	Always 100%	1231h 53.8	91.4	**VOCs by PID** (ppbv/ppmv)[d]	0 ppbv IN FIRST RKG BAY @ 1229h. 0 ppbv @ SVE @ 1230h. 0 ppbv @ 1236h @ SVE	

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	—	—	—	—	—

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

SAMPLES: TEDLAR BAGS; 4/SAMPLES; 1 EACH HOUR FROM 1100 → 1400
10,000 ppbv STANDARD READ 9878 ppbv ON PID ∴ REASONABLE CALIBRATION

Signature: B I Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Bob Thomas						**Day/Date:** Weds 18 June 2014
Weather Condition: (temp, barometer, wind, etc)		1045h 55F. Cloudy, wind light breeze from southeast				
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** OFF			**Time Off:** OFF		
AS Blower Vault						
Air Sparge Wells						
11574-ASW-1						NO READINGS
11574-ASW-2						
Extraction Blower Suction						
11574-SVE-BS-1		75	7.9	#		BATTERIES DEAD IN THERMOMETER
11574-SVE-BS-2		100	36.2			
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	55.4		**VOCs by PID** (ppbv/ppmv)[d]	62 ppbv @ 1048h 62 ppbv @ 1102h

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
						NO READINGS

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

SVE EXHAUST SAMPLES - 2 TEDLAR BAGS

Signature: Bob Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						Day/Date: FRI. 6 JUNE 2014
Weather Condition: (temp, barometer, wind, etc)			55°F, SUNNY, WIND 7mph			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1010				**Time Off:** 1110	
AS Blower Vault	1110	100	—	215°F	105 psi	
Air Sparge Wells						
11574-ASW-1	1022	100	—	67.4°F	19 psig	
11574-ASW-2	1025	100	—	75.2°F	16 psig	
Extraction Blower Suction						
11574-SVE-BS-1	—	75	23.2	64.8°F	3 IN WC	
11574-SVE-BS-2	—	100	31.3	63.7°F	6 IN WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	52.5	87.1°F	**VOCs by PID** (ppbv/ppmv)[d]	30 ppbv @ 1045

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.015	0.015	0.020	0.020	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

ISOLATED SVE ZONES 3 MIN EA. DRAINED KO DRUM ~ 0 MIN. KO DRUM EMPTY

Signature: Jenny Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS						Day/Date: FRI 30 MAY 2014
Weather Condition: (temp, barometer, wind, etc) SUNNY, LT WINDS W; 64°F						
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/(°F)[b])	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** ~~1317~~ 1317:30				**Time Off:** 1408	
AS Blower Vault	1408	100	—	150	16 psig	
Air Sparge Wells						
11574-ASW-1	1347	100	—	68.3	19 psig	
11574-ASW-2	1345	100	—	73.8	14 psig	
Extraction Blower Suction						
11574-SVE-BS-1	1358 h	75	13.7	70.8	3 in WC	
11574-SVE-BS-2	1359 h	100	35.6	66.5	5 in WC	
Extraction Blower Exhaust (11574-SVE-BE-1) 1357h		Always 100%	55.1	103.5	**VOCs by PID** (ppbv/ppmv)[d]	PARKING BAY NEXT TO SVE: 1353h: 41 ppbv @ 1354h: 72 ppbv @ SVE EXIT. @ 1405h: 12 ppbv @ SVE EXIT

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.015	0.015	0.025	0.035	0.020	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

ISOLATED SVE ZONES & DRAINED KO DRUM.

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						**Day/Date:** THURS. 1 MAY 2014
Weather Condition: (temp, barometer, wind, etc)			54°F, CLEAR, WIND @ 2 mph			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0900			**Time Off:** 1005		
AS Blower Vault	1005	100	—	215 °F	15 psig	
Air Sparge Wells						
11574-ASW-1	0912	100	—	59.1°F	18 psig	
11574-ASW-2	0910	100	—	65.3°F	15 psig	
Extraction Blower Suction						
11574-SVE-BS-1		75	21.2	60.7°F	4 in WC	
11574-SVE-BS-2		100	29.3	63.6°F	5 in WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.6	91.6°F	**VOCs by PID** (ppbv/ppmv)[d]	156 ppb @ 1010

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.010	0.015	0.020	0.020	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

SVE CONES ISOLATED 5 MIN EA. DRAINED KO DRUM ~ 4 MIN

Signature: James Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: JEREMY BECKER					**Day/Date:** THURS. 24 APR 2014	
Weather Condition: (temp, barometer, wind, etc)			50°, CLOUDY, WIND @ 11 MPH			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1030				**Time Off:** 1140	
AS Blower Vault	1140	100	—	282 °F	16 psig	
Air Sparge Wells						
11574-ASW-1	1042	100	—	56.1 °F	18 psig	
11574-ASW-2	1135	100	—	64.5 °F	14 psig	
Extraction Blower Suction						
11574-SVE-BS-1	1057	75	31.3	56.9 °F	3 IN WC	
11574-SVE-BS-2	1057	100	33.7	56.6 °F	5 IN WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	53.2	79 °F	**VOCs by PID** (ppbv/ppmv)[d]	46 ppb @ 1125

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.02	0.020	0.030	0.025	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

ISOLATED SVE ZONES 5 MIN EA. DRAINED KO DRUM ~ 3 MIN.

Signature: Jeremy Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						**Day/Date:** THURS. 10 APR 2014
Weather Condition: (temp, barometer, wind, etc)			46°F, CLEAR, WIND 7MPH			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1035				**Time Off:** 1150	
AS Blower Vault		100	—	210°F	16.0	
Air Sparge Wells						
11574-ASW-1	1112	100	—	55.1°F	18.0	
11574-ASW-2	1110	100	—	61.6°F	15.0	
Extraction Blower Suction				61.3°F		
11574-SVE-BS-1		75	22.2	[illegible]	5 IN WC	
11574-SVE-BS-2		100	30.6	61.7°F	8 IN WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	46.5	85.9°F	**VOCs by PID** (ppbv/ppmv)[d]	176 ppb @ 1145

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N2 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.015	0.010	0.025	0.020	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

KO DRUM EMPTY. ISOLATED SVE ZONES 5 MIN EA. DRAINED KO DRUM ~ 3 MIN.

Signature: J. Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: Bob Thomas						**Day/Date:** THURS 3 APR 2014
Weather Condition: (temp, barometer, wind, etc)			CLOUDY, BREEZE FROM SW. ~46% REL. HUM.; 29.92 in; 1013.3 mb; (FROM SRH.NOAA.GOV)			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/(°F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1049				**Time Off:** 1203	
AS Blower Vault	1202	100	—	197.5	16.5	
Air Sparge Wells						
11574-ASW-1	1139	100	—	53.8 F	17.5 psig	
11574-ASW-2	1141	100	—	62.8 F	14.5 psig	
Extraction Blower Suction						
11574-SVE-BS-1	1151	85	25.3	58.1	4" WC	
11574-SVE-BS-2	1152	100	25.5	57.3	4" WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	54.4	78.0	**VOCs by PID** (ppbv/ppmv)[d]	73 ppbv @ 1108h 153 ppbv @ 1147h 167 ppbv @ 1159

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
1119 - 1143	0.020	0.020	0.020	0.025	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

- ISOLATED SVE ZONES & DRAINED KO DRUM.
- BUMPED OUT SW + SE SUBSLAB PORTS.

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS						Day/Date: FRI 28 MARCH 2014
Weather Condition: (temp, barometer, wind, etc)			RAIN, 48F			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1400			**Time Off:** 1425		
AS Blower Vault		100	—	150F		
Air Sparge Wells						
11574-ASW-1		100	—	NOT MSD	~~18" W~~	17psig
11574-ASW-2		100	—	NOT MSD	NO ROG	
Extraction Blower Suction						
11574-SVE-BS-1		75	16.2	NOT MSD	4" WC	
11574-SVE-BS-2		100	31.8	NOT MSD	5" WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.0	NOT MEASURED	**VOCs by PID** (ppbv/ppmv)[d]	1428h: 240ppbv

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	.020	.020	.030	.025	NO ROG

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

ISOLATED SVE ZONES + DRAINED KO DRUM; FULL THEN JUST A FEW GALLONS.

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS						Day/Date: THURS 20 MARCH 2014
Weather Condition: (temp, barometer, wind, etc)			SUNNY, SPARSE CLOUDS; 48F			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1432			**Time Off:** 1530		
AS Blower Vault	1529	100	NA	205 F	17	
Air Sparge Wells						
11574-ASW-1	1527	100	NA	51.6	18.6	
11574-ASW-2	1522	100	NA	63.8	14.5 psig	
Extraction Blower Suction						
11574-SVE-BS-1		75	15.4	55.4	4 inWC	SOUTH ZONE
11574-SVE-BS-2		100	33.1	55.1	5 inWC	NORTH ZONE
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	51.2	84.1	**VOCs by PID** (ppbv/ppmv)[d]	1438h: 0-14 ppbv in 1st pkg bay 1452h: 17 ppbv @ EXH 1500h: 290 ppbv @ EXH + CLEAN BENCH

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	216 ppbv @ EXH @ 1532h
1507 – 1524	0.015	0.015	0.034	0.022	0.02	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

ISOLATED SVE ZONES UNTIL KO DRUM FULL / DRAINED. ISOLATED / DRAINED 2ND TIME.

Signature: B Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB THOMAS						Day/Date: THURS 13 MARCH 2014
Weather Condition: (temp, barometer, wind, etc) @ 1553			57F; NO WIND, DWPT ~ 40, REL H ~ 55% FROM SRH.NOAA.GOV BAR: ~30.05			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1452			**Time Off:** 1606		
AS Blower Vault	1606	100	—	215	16	
Air Sparge Wells						
11574-ASW-1	1524	100	—	50.8	17.5 psig	
11574-ASW-2	1516	100	—	63.9	15 psig	
Extraction Blower Suction						
11574-SVE-BS-1	1550	75	9.4	59.3F	6 in WC	
11574-SVE-BS-2	1551	100	33.0	59.1F	6 in WC	
Extraction Blower Exhaust (11574-SVE-BE-1) 1545H	Always 100%		50.2	85.6F	**VOCs by PID** (ppbv/ppmv)[d]	1542h 0 ppbv in 1ST PRG BAY 1543h 24 ppbv @ EXH 1600h 21 ppbv @ EXH

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
1520 -> 1530	0.015	0.020	0.020	0.020	0.015

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

- DRAINED KO DRUM, THEN ISOLATED EACH SVE ZONE UNTIL PRESSURE GAUGE STABILIZED; THEN REPEATED FOR EACH ZONE. PLUG POPPED OUT / NOT TIGHT IN MW 10A17-S. - BUBBLING SPARGED WATER REINSTALLED & TIGHTENED PLUG.

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						**Day/Date:** THURS. 20 FEB 2014
Weather Condition: (temp, barometer, wind, etc)			43°F, SHOWERS, WIND 12 mph			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1240				**Time Off:** 1340	
AS Blower Vault		100	—	180 °F	16 psig	
Air Sparge Wells						
11574-ASW-1	1307	100	—	45.6 °F	17 psig	
11574-ASW-2	1305	100	—	61.8 °F	14 psig	
Extraction Blower Suction						
11574-SVE-BS-1		75	27.2	46.4 °F	4.5 in. H_2O	
11574-SVE-BS-2		100	30.4	48.8 °F	4 in H_2O	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	47.4	72.6 °F	**VOCs by PID** (ppbv/ppmv)[d]	67 ppb @ 1330

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	*	*	*	*	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

KO DRUM DRAINED ~ 5 MINS. SVE ZONES ISOLATED 5 MINS EA. KO DRUM DRAINED ~ 3 MINS.

* WIND CONDITIONS EFFECTING READINGS

Signature: James Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER, D. BOSSARD					**Day/Date:** THURS, 6 FEB 2014	
Weather Condition: (temp, barometer, wind, etc)			18°F PARTLY CLOUDY, WIND 4 MPH			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0900			**Time Off:** 1000		
AS Blower Vault		100	—	170°F	16.5 psig	
Air Sparge Wells						
11574-ASW-1	0938	100	—	43°F	16 psig	
11574-ASW-2	0936	100	—	50.2°F	13 psig	
Extraction Blower Suction						
11574-SVE-BS-1		75	26.9	41.6°F	*	
11574-SVE-BS-2		100	29.6	45.3°F	*	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	50.1	63.7°F	**VOCs by PID** (ppbv/ppmv)[d]	1460 ppb AND CLIMBING @ 0955

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
	0.010	0.010	0.020	0.020	0.010	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

DRAINED KO DRUM ~ 5 MIN. ISOLATED SVE ZONES 5 MIN EA. DRAINED KO DRUM ~ 3 MIN.

*GAUGES FROZEN/NOT FUNCTIONING @ TIME OF INSPECTION

Signature: Jeremy Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: BOB T.						**Day/Date:** THURS 30 JAN 2014
Weather Condition: (temp, barometer, wind, etc)			LIGHT RAIN, NO BREEZE, 46°F 29.90 in Hg @ 0953 ; 29.88 in Hg @ 1253 PM			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0921				**Time Off:** 1250	
AS Blower Vault		100	—	200F	15 PSIG	
Air Sparge Wells						
11574-ASW-1	1247	100	—	46.1F	15.5	
11574-ASW-2	1243	100	—	60.6F	13.5	
Extraction Blower Suction						
11574-SVE-BS-1	1300	75	21.5	46.8F	3.0	
11574-SVE-BS-2	1301	100	35.1	47.3F	5.0	
Extraction Blower Exhaust (11574-SVE-BE-1)	1305	Always 100%	49.7	55.8F	**VOCs by PID** (ppbv/ppmv)[d]	2630 ppbv @ 1303 2212 ppbv @ 1309 0 ppbv @ OUTDOOR (NORTH) + INSIDE SVE BLOWER BUILDING

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)	
1251 – 1300	0.045	0.050	0.025	0.030	0.015	

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

ISOLATED SVE ZONES. DRAINED KO DRUM 2X – FOR ~ 5.5 min (full) ~ 2 min.

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						**Day/Date:** THURS. 16 JAN 2014
Weather Condition: (temp, barometer, wind, etc)			39°F OVERCAST, WIND 4 MPH			
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0945				**Time Off:** 1330 *	
AS Blower Vault	1045	100	—	177°F	15 psig	* 200°F @ TIME OF SHUT OFF
Air Sparge Wells						
11574-ASW-1	1042	100	—	45.8°F	16 psig	
11574-ASW-2	1040	100	—	60.8°F	13 psig	
Extraction Blower Suction						
11574-SVE-BS-1	—	75	26.5	51.9°F	5 IN WC	
11574-SVE-BS-2	—	100	29.2	52.7°F	3 IN WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	49.8	72.4°F	**VOCs by PID** (ppbv/ppmv)[d]	COULD NOT BE TAKEN DUE TO LOW BATTERY

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.020	0.020	0.040	0.035	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

SVE ZONES ISOLATED 2 MINS EA. KO DRUM DRAINED COMPLETELY ~ 10 MINS.

SVE ZONES ISOLATED ~ 10 MINS EA. KO DRUM DRAINED ~ 3 MINS.

Signature:

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: B. ROBS T.					Day/Date: FRI 10-JANUARY 2014	
Weather Condition: (temp, barometer, wind, etc) 46 F, CLOUDY LIGHT BREEZE FROM SOUTHWEST.	99% REL H; 30.06 → 30.09 in ALT.; 1019.5 → 1018.4 mb (SEA LVL) @ 11:58 → 12:58 (FROM NWS FOR GAAF).					
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 1026				**Time Off:** 1244	
AS Blower Vault	1244	—	~~200F~~ -	200F	15.5 psig	
Air Sparge Wells						
11574-ASW-1	1240	100	—	46.9F	15.5	psig
11574-ASW-2	1239	100	—	61.2F	13.5	psig
Extraction Blower Suction						
11574-SVE-BS-1	1250	75	11.3	49.4F	4 in	
11574-SVE-BS-2	1251	100	31.7	51.4F	4 in	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	44.8	75.3F	**VOCs by PID** (ppbv/ppmv)[d]	TIME 1220 1248 / PPBV 847 740

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
TIM: 1224 → 1233	Ø.Ø2Ø	Ø.Ø2Ø	Ø.Ø2Ø	Ø.Ø25	Ø.Ø1Ø

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.

ISOLATED SVE ZONES. DRAINED KO DRUM (FULL). ISOLATED ZONES & DRAINED AGAIN (~ 1/2 FULL).

Signature: B. Thomas

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

Air Sparge Blower, Air Sparge Wells, Extraction Laterals, Extraction Blower, Subslab Depressurization

Technician: J. BECKER						Day/Date: THURS. 2 JAN 2014
Weather Condition: (temp, barometer, wind, etc) 41°F CLOUDY						
Monitoring Point	**Time**	**Valves** (% Open)	**Flow** (m/s)	**Temp.** (°C/ °F)[b]	**Pressure** (in H_2O +/-)[c] (psig)[c]	**Comments**
Air Sparge Blower	**Time On:** 0945				**Time Off:** 1100	
AS Blower Vault		100	—	177°F	15 psi	
Air Sparge Wells						
11574-ASW-1	1040	100	—	46.1°F	16 psig	
11574-ASW-2	1038	100	—	60.3°F	13 psig	
Extraction Blower Suction						
11574-SVE-BS-1		100	27.6	53.4°F	3 IN WC	
11574-SVE-BS-2		75	25.8	51.7°F	4 IN WC	
Extraction Blower Exhaust (11574-SVE-BE-1)		Always 100%	40.3	78.1°F	**VOCs by PID** (ppbv/ppmv)[d]	1795 ppb AND CLIMBING @ 1000

Sub-slab Probe Pressures	**SSD-S1 (SE)** (in W.C.)	**SSD-S2 (SW)** (in W.C.)	**SSD-N1 (NE)** (in W.C.)	**SSD-N1 (NW)** (in W.C.)	**SSD-3 (inside)** (in W.C.)
	0.020	0.020	0.025	0.020	0.010

Comments (e.g. Duration of KO drum draining, Valve Position Changes, Samples, etc.)

DRAINED KO DRUM ~ 5 MIN. ISOLATED SVE ZONES 5 MIN EA. DRAINED DRUM AGAIN ~ 5 MIN.

Signature: Jeremy Becker

Notes:
a: Identify phase of testing, AS and SVE valve positions, etc.;
b: Identify temperature units.
c: Identify negative or positive pressure. (in H_2O for SVE blower, psig for sparge blower).
d. Identify units of measurement.

APPENDIX B

AIR SPARGE SYSTEM FIELD DATA

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	AS Blower ON TIME	AS Blower OFF Time	AS Blower ON TIME	AS Blower OFF Time	AS Blower ON TIME	AS Blower OFF Time	AS Blower ON TIME
5/11/2012	-	-	-	-	-	-	-
9/21/2012	-	-	-	-	-	-	-
9/28/2012	-	-	-	-	-	-	-
10/11/2012	-	-	-	-	-	-	-
10/19/2012	-	-	-	-	-	-	-
10/29/2012	-	-	-	-	-	-	-
11/5/2012	-	-	-	-	-	-	-
11/30/2012	11:55	12:40	-	-	-	-	-
1/17/2013	9:08	10:18	-	-	-	-	-
1/25/2013	13:14	13:56	-	-	-	-	-
2/8/2013	8:58	10:55	-	-	-	-	-
2/15/2013	12:25	13:19	-	-	-	-	-
2/27/2013	9:30	10:30	-	-	-	-	-
3/8/2013	10:15	11:14	-	-	-	-	-
3/22/2013	10:04	12:32	-	-	-	-	-
3/29/2013	9:38	13:52	-	-	-	-	-
4/5/2013	10:20	12:34	-	-	-	-	-
4/19/2013	10:18	13:29	-	-	-	-	-
6/28/2013	9:40	12:30	-	-	-	-	-
7/12/2013	9:46	14:28	-	-	-	-	-
7/19/2013	11:23	13:41	-	-	-	-	-
8/2/2013	13:26	15:06	-	-	-	-	-
8/15/2013	10:14	13:58	-	-	-	-	-
8/23/2013	11:16	15:22	-	-	-	-	-
9/13/2013	11:42	15:08	-	-	-	-	-
10/4/2013	9:25	14:07	-	-	-	-	-
10/10/2013	12:10	12:11	-	-	-	-	-
11/7/2013	9:12	11:39	-	-	-	-	-
11/14/2013	13:20	14:25	-	-	-	-	-
11/22/2013	8:33	9:33	-	-	-	-	-
11/26/2013	11:05	11:54	-	-	-	-	-
12/12/2013	10:32	11:40	-	-	-	-	-
1/2/2014	9:45	11:00	-	-	-	-	-
1/10/2014	10:26	12:44	-	-	-	-	-
1/16/2014	9:45	13:30	-	-	-	-	-
1/23/2014	9:15	10:15	-	-	-	-	-
1/30/2014	9:21	12:50	-	-	-	-	-
2/6/2014	9:00	10:00	-	-	-	-	-
2/20/2014	12:40	13:40	-	-	-	-	-
3/13/2014	14:52	16:06	-	-	-	-	-
3/20/2014	14:32	15:30	-	-	-	-	-
3/28/2014	14:00	14:25	-	-	-	-	-
4/3/2014	10:49	12:03	-	-	-	-	-
4/10/2014	10:35	11:50	-	-	-	-	-
4/24/2014	10:30	11:40	-	-	-	-	-

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	AS Blower ON TIME	AS Blower OFF Time	AS Blower ON TIME	AS Blower OFF Time	AS Blower ON TIME	AS Blower OFF Time	AS Blower ON TIME
5/1/2014	9:00	10:05	-	-	-	-	-
5/30/2014	13:17	14:08	-	-	-	-	-
6/6/2014	10:10	11:10	-	-	-	-	-
6/18/2014	OFF	OFF	-	-	-	-	-
6/24/2014	12:00	13:00	-	-	-	-	-
7/3/2014	10:00	11:00	-	-	-	-	-
7/30/2014	22:00	23:00	-	-	-	-	-
8/5/2014	22:00	23:00	-	-	-	-	-
8/12/2014	22:00	23:00	-	-	-	-	-
8/19/2014	22:00	23:00	-	-	-	-	-
8/29/2014	22:00	23:00	-	-	-	-	-
9/8/2014	22:00	23:00	-	-	-	-	-
9/12/2014	22:00	23:00	-	-	-	-	-
9/19/2014	22:00	23:00	-	-	-	-	-
9/29/2014	22:00	23:00	-	-	-	-	-
10/6/2014	22:00	23:00	-	-	-	-	-
11/4/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00
11/10/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00
11/17/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00
11/26/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00
12/5/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00
12/12/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00
12/24/2014	6:00	6:30	12:00	12:30	18:00	18:30	0:00

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	AS Blower OFF Time	AS Blower Temp. (°F)	AS Blower Pressure (psi)	11574-ASW-1 Temp (°F)	11574-ASW-1 Pressure (psi)	11574-ASW-2 Temp. (°F)
5/11/2012	-	52	18			
9/21/2012	-	60	18			
9/28/2012	-	205	14			
10/11/2012	-	205	15			
10/19/2012	-	205	15			
10/29/2012	-	205	16			
11/5/2012	-	205	15			
11/30/2012	-	190	16	63.4	16	49.9
1/17/2013	-	180	16	42.8	17	56.1
1/25/2013	-	200	16	45.5	16.5	
2/8/2013	-	200	16.5	46.4	16.5	56.4
2/15/2013	-	200	16		17	
2/27/2013	-	190	17		13	
3/8/2013	-	185	16	48.8	17	58.6
3/22/2013	-	184.3	16.5	55.3	16.5	
3/29/2013	-	224	15	59.6	17	73.1
4/5/2013	-	210	16	57.5	16.5	
4/19/2013	-	215	16	63.4	13.5	63.4
6/28/2013	-	204	14.5	71.8	15	84.5
7/12/2013	-	160	15	76.8	16	72.3
7/19/2013	-	205	14.5	72.1	15	
8/2/2013	-	145	14.5			
8/15/2013	-	225	15	80.8	15.5	73.5
8/23/2013	-	230	15	77.8	15	
9/13/2013	-	225	14.5	75.5	15	74.2
10/4/2013	-	225	14.5	62.4	16.5	69.3
10/10/2013	-		16			57
11/7/2013	-	210	15	55.1	15.5	64.9
11/14/2013	-	200	15	53.7	16	65.9
11/22/2013	-	175	16	49.8	16	59.6
11/26/2013	-	180	16.5	48.2	17	57.9
12/12/2013	-	175	16	41.8	17	
1/2/2014	-	177	15	46.1	16	60.3
1/10/2014	-	200	15.5	46.9	15.5	61.2
1/16/2014	-	177	15	45.8	16	60.8
1/23/2014	-	176	16	46.1	16	58.2
1/30/2014	-	200	15	46.1	15.5	60.6
2/6/2014	-	170	16.5	43	16	50.2
2/20/2014	-	180	16	45.6	17	61.8
3/13/2014	-	215	16	50.8	17.5	63.9
3/20/2014	-	205	17	51.6	18.6	63.8
3/28/2014	-	150			17	
4/3/2014	-	197.5	16.5	53.8	17.5	62.8
4/10/2014	-	210	16	55.1	18	61.6
4/24/2014	-	202	16	56.1	18	64.5

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	AS Blower OFF Time	AS Blower Temp. (°F)	AS Blower Pressure (psi)	11574-ASW-1 Temp (°F)	11574-ASW-1 Pressure (psi)	11574-ASW-2 Temp. (°F)
5/1/2014	-	215	15	59.1	18	65.3
5/30/2014	-	150	16	68.3	19	73.8
6/6/2014	-	215	105	67.4	19	75.2
6/18/2014	-					
6/24/2014	-					
7/3/2014	-	220	17	68.1	0	70.3
7/30/2014	-		15		0	71
8/5/2014	-				0	76.6
8/12/2014	-	75.2	14		0	
8/19/2014	-	71.7	13	79.6	0.5	70.4
8/29/2014	-	72.1	14	73.9	0	70.8
9/8/2014	-	69.7	14	69.2	0	70.3
9/12/2014	-	68	14	71.6	0	67.9
9/19/2014	-	66.9	14	71.6	0	
9/29/2014	-	64.8	4	64.1	0.5	68.8
10/6/2014	-	70	14	65.8	0.5	66.9
11/4/2014	0:30	69.9	14	57.6	14	57.2
11/10/2014	0:30	113	16.5	58.6	14	66.6
11/17/2014	0:30	54.3	17	46.6	1	64.4
11/26/2014	0:30	66.6	17	51.8	2	65.8
12/5/2014	0:30	55.5	16	45.4	1	64.4
12/12/2014	0:30	68.3	17	49.9	6	66.1
12/24/2014	0:30	48.8	14	114	17	66.1

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	11574-ASW-2 Pressure (psi)	11574-SVE-BS-1 Flow (m/s)	11574-SVE-BS-1 Temp. (^{o}F)	11574-SVE-BS-1 Pressure (psi)	11574-SVE-BS-2 Flow (m/s)
5/11/2012			39	4	
9/21/2012		19.6	60	4	28.4
9/28/2012		16.4	55	3	13.6
10/11/2012		17.3	60	2	14.5
10/19/2012		16.8	50	2	13.6
10/29/2012		15.4	57	2.5	12.8
11/5/2012		5.3	55	3	19.2
11/30/2012	14	21.7		4	31.3
1/17/2013	14	10.1		5	36.5
1/25/2013		24.2	57.8	5	27.8
2/8/2013	13	10.2		6	32.8
2/15/2013	14	12.3			38.2
2/27/2013	12	25.1	55.6	4.5	34.2
3/8/2013	14	11.2	48.9	4	35.3
3/22/2013		24.8	55.7	5	29.9
3/29/2013	13.5	15.2	50.8	3	28.7
4/5/2013		17.1	55.6	4	34.4
4/19/2013	13.5	14.3	57.9		31.1
6/28/2013	13	9.5	74.8	4	31
7/12/2013	12.5	12.5	70.3	4	40.8
7/19/2013		10.8	75.1	4	31.9
8/2/2013		14.8		4	33.6
8/15/2013	12.5	6.5	68.8	2	32.6
8/23/2013		13.2	71.7	2	33.7
9/13/2013	12.5	12.6	70.9	2	34.7
10/4/2013	13	9.6	64.3	3	34.5
10/10/2013	14	14.3	59.6	3	28.2
11/7/2013	13	13.5	54.6	4	32.1
11/14/2013	13.5	25.4	57.5	8	22.5
11/22/2013	13.2	13.4	48.5	6	22.9
11/26/2013	13.9	30.5	54.5	5	22.8
12/12/2013		22.5	43.3	5	26.2
1/2/2014	13	27.6	53.4	3	25.8
1/10/2014	13.5	11.3	46.9	4	31.7
1/16/2014	13	26.5	51.9	5	29.2
1/23/2014	13	25.8	49.6	5	30.1
1/30/2014	13.5	21.5	46.8	3	35.1
2/6/2014	13	26.9	41.6		29.6
2/20/2014	14	27.2	46.4	4.5	30.4
3/13/2014	15	9.4	59.3	6	33
3/20/2014	14.5	15.4	55.4	4	33.1
3/28/2014		16.2		4	31.8
4/3/2014	14.5	25.3	58.1	4	25.5
4/10/2014	15	22.2	61.3	5	30.6
4/24/2014	14	31.3	56.9	3	33.7

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	11574-ASW-2 Pressure (psi)	11574-SVE-BS-1 Flow (m/s)	11574-SVE-BS-1 Temp. (^{o}F)	11574-SVE-BS-1 Pressure (psi)	11574-SVE-BS-2 Flow (m/s)
5/1/2014	15	21.2	60.7	4	29.3
5/30/2014	14	13.7	70.8	3	35.6
6/6/2014	16	23.2	64.8	3	31.3
6/18/2014		7.9			36.2
6/24/2014		10.2	73.7	2	34.6
7/3/2014		24.5	67.4		28.9
7/30/2014	0	18.3	63.8		35.2
8/5/2014	0	11		0	30
8/12/2014	0	16.9			27.4
8/19/2014	0	12	76.5		31
8/29/2014	0	4.6	68.6	4	33.3
9/8/2014	0	12.2	69.3	4	34.8
9/12/2014	0	30.3	69.3	2	28.2
9/19/2014		24.1	76.3	2.5	33.1
9/29/2014	0	36.4	58.1	3	32.7
10/6/2014	1	24.6	76	1.5	36.2
11/4/2014	1	20.2	58.9	3.5	35.2
11/10/2014	1	30.7	57.6	3.5	36.1
11/17/2014	0	30.3	53.7	2.5	37.7
11/26/2014	2	33.3	57.6	2.5	36.2
12/5/2014	1	27.9	52.4	2.5	34.6
12/12/2014	5	24.4	56.5	2.5	36.5
12/24/2014	12	36.6	52.1	2.5	38

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	11574-SVE-BS-2 Temp. (°F)	11574-SVE-BS-2 Pressure (psi)	11574-SVE-BE-1 Flow (m/s)	11574-SVE-BE-1 Temp. (°F)	11574-SVE-BE-1 VOCs (ppb)
5/11/2012	39	4			84
9/21/2012	60	4			76
9/28/2012	55	3	40.6	55	45
10/11/2012	60	2	42.3	60	37
10/19/2012	50	2	46.9	50	52
10/29/2012	57	2.5	54.2	57	77
11/5/2012	55	3		55	174
11/30/2012		4	48.4		0
1/17/2013		6	51		0
1/25/2013	52.7	5	48.1	70.7	0
2/8/2013		6	47.8	75.8	1159
2/15/2013			45.4	88.4	260
2/27/2013	56.3	6	45.7	75.3	163
3/8/2013	50.1	6	50.1	71.9	0
3/22/2013	55.3	6	54.7	81.3	1164
3/29/2013	47.6	6	54.3	86.6	3771
4/5/2013	55.8	6	49.8	63.7	2244
4/19/2013	57.6		53.5	71.6	923
6/28/2013	72	7	46	91.9	499
7/12/2013	68.1	6	54.5	97.3	1954
7/19/2013	72.9	8	51	108.8	240
8/2/2013		8	53.8		9708
8/15/2013	68.3	5	46.7	89.8	17000
8/23/2013	70.6	6	50.8	93.2	30800
9/13/2013	69	6	52		27400
10/4/2013	65.6	4	54.5	96.2	100000
10/10/2013	59.9	6	51	77.4	270
11/7/2013	56.4	4	56.8	73.7	1320
11/14/2013	56.3	6	48.5	79.6	
11/22/2013	51.2	6	49.9	65.8	2212
11/26/2013	53.3	5	48.6	74.6	1585
12/12/2013	47.2	4	44.8	67.5	1215
1/2/2014	51.7	4	40.3	78.1	1795
1/10/2014	51.4	4	44.8	75.3	847
1/16/2014	52.7	3	49.8	72.4	
1/23/2014	50.6	4	50.1	70	197
1/30/2014	47.3	5	49.7	55.8	2630
2/6/2014	45.3		50.1	63.7	1460
2/20/2014	48.8	4	47.4	72.6	67
3/13/2014	59.1	6	50.2	85.6	28
3/20/2014	55.1	5	51.2	84.1	290
3/28/2014		5	51		240
4/3/2014	57.3	4	54.4	78	167
4/10/2014	61.7	8	46.5	85.9	176
4/24/2014	56.6	5	53.2	79	46

Table B-1a: AS/SVE System Field Data - AS and SVE Operation

Date	11574-SVE-BS-2 Temp. (^{o}F)	11574-SVE-BS-2 Pressure (psi)	11574-SVE-BE-1 Flow (m/s)	11574-SVE-BE-1 Temp. (^{o}F)	11574-SVE-BE-1 VOCs (ppb)
5/1/2014	63.6	5	51.6	91.6	156
5/30/2014	66.5	5	55.1	103.5	72
6/6/2014	63.7	6	52.5	87.1	30
6/18/2014			55.4		62
6/24/2014	71.9	4	53.8	91.4	0
7/3/2014	66.3		47.3	89.1	70
7/30/2014	64.4	6	54.7	83.8	46
8/5/2014		7	48.5		50
8/12/2014			52.1		0
8/19/2014	76.5		47	112	0
8/29/2014	67.9	7.5	50.4	85.6	48
9/8/2014	69.3	7	51.6	89.8	0
9/12/2014	67.5	6	52.1	114.2	0
9/19/2014	72.6	6	51.7	106	0
9/29/2014	58.4	6.5	52	71.3	0
10/6/2014	70.3	6.5	51.6	99.5	0
11/4/2014	59.2	8	52.5	81.6	16
11/10/2014	57.8	8	51.2	88.3	1
11/17/2014	51.2	8	50.5	80	14
11/26/2014	58.8	7.5	51.9	81.7	78
12/5/2014	55.7	7.5	54.2	77	21
12/12/2014	57.6	8	55.4	86.6	24
12/24/2014	54.6	8	54.5	76.3	24

Notes:
- = no data
ppb = parts per billion; measured using a photoionization detector
^{o}F = degrees fahrenheit
psi = pounds per square inch

Table B-1b: AS/SVE System Field Data - Sub-Slab Pressures

Date	SSD-S1 (SE) (in. WC)	SSD-S2 (SW) (in. WC)	SSD-N1 (NE) (in. WC)	SSD-N2 (NW) (in. WC)	SSD-3 (inside) (in. WC)	COMMENTS
5/11/2012	0.0005	0.02	0.035	0.03		Ran blower for 1 hour
9/21/2012	0.025	0.025	0.03	0.02	0.05	Ran blower for 1 hour
9/28/2012	0.02	0.025	0.025	0.05	0.05	Ran blower for 1 hour
10/11/2012	0.05	0.025	0.025	0.05	0.05	Ran blower for 1 hour
10/19/2012	0.05	0.025	0.025	0.05		Ran blower for 1 hour
10/29/2012	0.05	0.025	0.02	0.05		Ran blower for 1 hour
11/5/2012	0.05	0.025	0.025	0.05	0.05	Ran blower for 1 hour
11/30/2012	0.09	0.07	0.03	0.04	0.02	Windy conditions probably account for higher pressure at south side of building
1/17/2013	0.035	0.03	0.04	0.02	0.02	
1/25/2013	0.032	0.03	0.04	0.025		
2/8/2013						
2/15/2013	0.026	0.03	0.035	0.025	0.02	
2/27/2013	0.035	0.03	0.04	0.035	0.025	
3/8/2013	0.025	0.04	0.03	0.025	0.02	
3/22/2013	0.015	0.015	0.03	0.02	0.015	
3/29/2013	0.015	0.015	0.03	0.025	0.02	
4/5/2013	0.035	0.04	0.035	0.035		
4/19/2013	0.045	0.03	0.05	0.035	0.02	
6/28/2013	0.02	0.01	0.02	0.02	0.02	
7/12/2013	0.015	0.015	0.025	0.02	0.02	
7/19/2013	0.02	0.015	0.02	0.02		
8/2/2013	0.02	0.015	0.02	0.02		
8/15/2013	0.022	0.025	0.03	0.035	0.025	
8/23/2013	0.02	0.025	0.03	0.03		
9/13/2013	0.025	0.025	0.03	0.035	0.02	
10/4/2013	0.015	0.02	0.025	0.02	0.02	
10/10/2013	0.01	0.025	0.025	0.02	0.02	Brief operation. Need new drum gasket.
11/7/2013	0.02	0.035	0.02	0.02	0.02	
11/14/2013	0.01	0.01	0.015	0.01	0.015	
11/22/2013	0.025	0.02	0.032	0.03	0.01	
11/26/2013	0.01	0.01	0.015	0.02	0.01	
12/12/2013	0.02	0.02	0.025	0.025	0.01	
1/2/2014	0.02	0.02	0.025	0.02	0.01	Drained KO Drum ~5 min. Isolated SVE zones 5 min each. Drained drum again ~ 5 min.
1/10/2014	0.02	0.02	0.02	0.025	0.01	Isolated SVE zones. Drained KO drum (full). Isoated zones and drained again (approx. half full).
1/16/2014	0.02	0.02	0.04	0.035	0.01	SVE zones isolated 2 min each. KO drum drained ~ 10 min. SVE zones isolated ~ 10 min each. KO drum drained ~ 3 min.
1/23/2014	0.025	0.02	0.03	0.025	0.015	Drained KO Drum ~5 min. Isolated SVE zones 5 min each. Drained drum again ~ 5 min.
1/30/2014	0.045	0.05	0.025	0.03	0.015	Isolated SVE zones. Drained KO drum 2x for ~ 5.5 min (full) ~ 2 min.
2/6/2014	0.01	0.01	0.02	0.02	0.01	
2/20/2014						Wind conditions effecting SSD readings.
3/13/2014	0.015	0.02	0.02	0.02	0.015	Plug popped out / not tight at MW 10A17-8. Bubbling sparged water. Reinstalled/tightened plug.
3/20/2014	0.015	0.015	0.03	0.022	0.02	
3/28/2014	0.02	0.02	0.03	0.025		
4/3/2014	0.02	0.02	0.02	0.025	0.015	
4/10/2014	0.015	0.01	0.025	0.02	0.01	
4/24/2014	0.02	0.02	0.03	0.025	0.01	
5/1/2014	0.01	0.015	0.02	0.02	0.01	
5/30/2014	0.015	0.015	0.025	0.035	0.02	
6/6/2014	0.015	0.015	0.02	0.02	0.01	
6/18/2014						SVE exhaust samples - 2 Tedlar bags.
6/24/2014	0.015	0.015	0.025	0.025	0.02	SVE exhaust samples - 4 Tedlar bags; 1 each hour from 11:00 - 14:00.
7/3/2014	0.015	0.015	0.02	0.025	0.01	
7/30/2014	0.025	0.025	0.03	0.03	0.02	Blower timer set to turn on at 10 PM and shutoff at 11:00 PM.
8/5/2014	0.035	0.035	0.03	0.035	0.02	Both blower suction pressure guages not working properly.
8/12/2014	0.03	0.02	0.025	0.025	0.015	Thermometer broken; replace pressure gauges on suction lines with pressure cap.
8/19/2014	0.02	0.035	0.03	0.025	0.02	
8/29/2014	0.015	0.025	0.03	0.025	0.025	
9/8/2014	0.03	0.02	0.04	0.03	0.015	
9/12/2014	0.02	0.02	0.03	0.03	0.02	
9/19/2014	0.01	0.015	0.03	0.02		
9/29/2014	0.03	0.03	0.03	0.035	0.015	
10/6/2014	0.02	0.02	0.025	0.035	0.015	Changed sparging frequency to 4 times daily.
11/4/2014	0.03	0.03	0.035	0.035	0.01	Collecting 4 tedlar bag samples and 1 duplicate.
11/10/2014	0.015	0.01	0.035	0.035	0.015	
11/17/2014	0.025	0.025	0.03	0.035	0.01	VOCs around ACU higher than normal ~10-20 ppb.
11/26/2014	0.03	0.03	0.03	0.03	0.015	
12/5/2014	0.025	0.025	0.03	0.035	0.01	
12/12/2014	0.03	0.025	0.03	0.03	0.015	
12/24/2014	0.025	0.03	0.03	0.035	0.015	

Notes:
in. WC - inches of water column

APPENDIX C

GROUNDWATER MONITORING DATA

Table C-1. AOC 9-2 Depth to Water and Groundwater Parameter Measurements

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (ms/cm)	DO (ppm)	ORP (mv)	Temp ºC
95-A17-1 236.9	1-Aug-95	30.49	204.77	-	-	-	-	-
	1-Feb-96	24.21	211.05	-	-	-	-	-
	1-Sep-96	28.2	207.06	-	-	-	-	-
	1-Mar-97	22.8	212.46	-	-	-	-	-
	1-Aug-97	26.4	208.86	-	-	-	-	-
	1-Mar-98	24.06	211.2	-	-	-	-	-
	1-Sep-98	29.2	206.06	-	-	-	-	-
	1-Mar-99	21.1	214.16	-	-	-	-	-
	1-Aug-99	27.01	208.25	-	-	-	-	-
	1-Mar-00	23.93	211.33	-	-	-	-	-
	1-Sep-00	28.99	206.27	-	-	-	-	-
	1-Mar-01	29.51	205.75	-	-	-	-	-
	1-Aug-02	29.6	205.66	-	-	-	-	-
	28-Oct-03	30.11	205.15	-	-	-	-	-
	20-Oct-04	30.94	204.32	-	-	-	-	-
	9-Nov-05	30.51	204.75	-	-	-	-	-
	14-Jun-07	26.33	208.93	-	-	-	-	-
	21-Mar-08	26.33	208.93	-	-	-	-	-
	8-Aug-08	29.78	205.48	-	-	-	-	-
	9-Mar-09	27.57	207.69	-	-	-	-	-
	25-Aug-09	29.87	207.03	-	-	-	-	-
	22-Feb-10	26.1	210.8	-	-	-	-	-
	24-Aug-10	28.6	208.3	-	-	-	-	-
	24-Feb-11	25.1	211.8	-	-	-	-	-
	9-Sep-11	Could Not Locate						
	14-Mar-12	25.5	211.4	-	-	-	-	-
	16-Aug-12	27.9	209	-	-	-	-	-
	21-Feb-13	24.28	212.62	-	-	-	-	-
	13-Aug-13	28.8	208.1	-	-	-	-	-
	10-Mar-14	23.6	213.3	-	-	-	-	-
	22-Sep-14	28.67	208.23	-	-	-	-	-
95-A17-2 235.9	1-Aug-95	30.2	204.59	-	-	-	-	-
	1-Feb-96	24.24	210.55	-	-	-	-	-
	1-Sep-96	27.71	207.08	-	-	-	-	-
	1-Mar-97	22.34	212.45	-	-	-	-	-
	1-Aug-97	26.08	208.71	-	-	-	-	-
	1-Mar-98	23.82	210.97	-	-	-	-	-
	1-Sep-98	28.7	206.09	-	-	-	-	-
	1-Mar-99	20.6	214.19	-	-	-	-	-
	1-Aug-99	26.55	208.24	-	-	-	-	-
	1-Mar-00	23.49	211.30	-	-	-	-	-
	1-Sep-00	28.51	206.28	-	-	-	-	-
	1-Mar-01	29.09	205.70	-	-	-	-	-
	1-Aug-02	28.92	205.87	-	-	-	-	-
	28-Oct-03	29.65	205.14	-	-	-	-	-
	28-Apr-04	27.97	206.82	-	-	-	-	-
	20-Oct-04	30.47	204.32	-	-	-	-	-
	9-Nov-05	30	204.79	-	-	-	-	-

Table C-1. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (ms/cm)	DO (ppm)	ORP (mv)	Temp ºC
95-A17-2 235.9 (continued)	31-Oct-06	30.38	204.41	6.89	0.155	-	-	13.30
	14-Jun-07	26.03	208.76	6.90	0.153	-	-	13.30
	21-Mar-08	26.02	208.77	7.32	0.139	-	-	12.43
	8-Aug-08	29.37	205.42	7.19	0.114	1.45	195.33	12.57
	9-Mar-09	27.21	207.58	7.24	0.124	0.62	148.75	13.33
	25-Aug-09	29.49	206.41	6.66	0.106	0.76	252.00	13.10
	22-Feb-10	25.5	210.40	-[1/]	-	-	-	-
	24-Aug-10	27.82	208.08	-[1/]	-	-	-	-
	24-Feb-11	24.4	211.50	5.48[1/]	0.126	3.06	-	12.80
	9-Sep-11	27.25	208.65	6.27	0.111	3.60	230.00	16.00
	14-Mar-12	24.73	211.17	-	-	5.96	26.00	11.20
	16-Aug-12	27.03	208.87	-	-	-	-	-
	21-Feb-13	25.37	210.53	7.45	-	5.07	23.00	13.20
	13-Aug-13	28.4	207.50	6.60	0.176	0.47	24.00	13.60
	10-Mar-14	Low Water Level, Unable to Collect Sample						
	22-Sep-14	27.7	208.20	6.50	0.147	5.90	173.00	17.20
95-A17-3A 235.9	1-Aug-95	30.41	204.81	-	-	-	-	-
	1-Feb-96	24.65	210.57	-	-	-	-	-
	1-Sep-96	28.06	207.16	-	-	-	-	-
	1-Mar-97	22.31	212.91	-	-	-	-	-
	1-Aug-97	26.1	209.12	-	-	-	-	-
	1-Mar-98	23.51	211.71	-	-	-	-	-
	1-Sep-98	28.7	206.52	-	-	-	-	-
	1-Mar-99	20	215.22	-	-	-	-	-
	1-Aug-99	26.44	208.78	-	-	-	-	-
	1-Mar-00	23.16	212.06	-	-	-	-	-
	1-Sep-00	28.54	206.68	-	-	-	-	-
	1-Mar-01	29.51	205.71	-	-	-	-	-
	1-Aug-02	29.14	206.08	-	-	-	-	-
	30-Jun-03	28.94	206.28	-	-	-	-	-
	28-Oct-03	29.85	205.37	-	-	-	-	-
	28-Apr-04	28.06	207.16	-	-	-	-	-
	20-Oct-04	30.88	204.34	-	-	-	-	-
	24-May-05	28.75	206.47	-	-	-	-	-
	9-Nov-05	30.32	204.90	-	-	-	-	-
	14-Jun-06	26.99	208.23	-	-	-	-	-
	31-Oct-06	30.86	204.36	6.49	0.253	-	-	12.60
	14-Jun-07	26.09	209.13	6.51	0.252	-	-	12.60
	21-Nov-07	29.21	206.01	6.05	0.205	-	-	13.00
	21-Mar-08	26	209.22	7.35	0.237	0.70	-	12.37
	8-Aug-08	29.42	205.80	7.16	0.214	0.97	-25.75	12.28
	9-Mar-09	27.07	208.15	7.04	0.227	0.71	-177.00	12.88
	25-Aug-09	29.46	206.44	6.03	0.199	0.77	233.00	13.10
	22-Feb-10	25.6	210.30	6.52	0.205	0.47	-196.00	12.80
	23-Aug-10	29.1	206.80	4.80	0.200	1.17	-125.00	13.10
	24-Feb-11	24.55	211.35	5.86	0.191	0.73	-	13.00
	9-Sep-11	27.62	208.28	6.07	0.177	4.87	-98.00	14.40
	14-Mar-12	24.85	211.05	-	-	-	-	-

Table C-1. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (ms/cm)	DO (ppm)	ORP (mv)	Temp ºC
95-A17-3A 235.9 (continued)	16-Aug-12	27.47	208.43	-	-	-	-	-
	21-Feb-13	25.66	210.24	-	-	-	-	-
	13-Aug-13	27.85	208.05	-	-	-	-	-
	14-Mar-14	22.9	213.00	6.36	0.223	7.70	26.00	13.60
	23-Sep-14	28.07	207.83	6.30	0.147	2.90	42.00	14.70
95-A17-4 236.8	1-Aug-95	29.91	205.24	-	-	-	-	-
	1-Feb-96	23.65	211.50	-	-	-	-	-
	1-Sep-96	27.56	207.59	-	-	-	-	-
	1-Mar-97	21.75	213.40	-	-	-	-	-
	1-Aug-97	25.85	209.30	-	-	-	-	-
	1-Mar-98	23.35	211.80	-	-	-	-	-
	1-Sep-98	28.7	206.45	-	-	-	-	-
	1-Mar-99	19.7	215.45	-	-	-	-	-
	1-Aug-99	26.33	208.82	-	-	-	-	-
	1-Mar-00	22.93	212.22	-	-	-	-	-
	1-Sep-00	28.1	207.05	-	-	-	-	-
	1-Mar-01	29.05	206.10	-	-	-	-	-
	1-Aug-02	29.04	206.11	-	-	-	-	-
	28-Oct-03	29.51	205.64	-	-	-	-	-
	20-Oct-04	30.5	204.65	-	-	-	-	-
	9-Nov-05	29.8	205.35	-	-	-	-	-
	14-Jun-07	25.72	209.43	-	-	-	-	-
	21-Mar-08	25.77	209.38	6.15	0.13	-	-	14.37
	8-Aug-08	29.31	205.84	7.15	0.14	6.81	130.00	12.00
	9-Mar-09	26.91	208.24	7.12	0.14	7.03	228.25	13.83
	25-Aug-09	29.32	207.48	-	-	-	-	-
	21-Feb-10	25.38	211.42	5.95	0.14	4.97	285.00	13.30
	24-Aug-10	27.95	208.85	-	-	-	-	-
	24-Feb-11	24.37	212.43	6.01	0.14	6.91	-	13.30
	9-Sep-11	27.45	209.35	6.09	0.13	5.90	353.00	14.30
	14-Mar-12	24.89	211.91	-	-	6.36	26.00	11.20
	16-Aug-12	27.29	209.51	-	-	-	-	-
	21-Feb-13	25.49	211.31	6.69	-	6.47	-146.00	13.50
	13-Aug-13	27.85	208.95	-	-	-	-	-
	14-Mar-14	22.5	214.30	6.26	0.18	8.55	32.00	13.50
	23-Sep-14	27.99	208.81	-	-	-	-	-
96-A17-5 233.9	1-Feb-96	22.44	211.14	-	-	-	-	-
	1-Sep-96	26.2	207.38	-	-	-	-	-
	1-Mar-97	20.75	212.83	-	-	-	-	-
	1-Aug-97	24.6	208.98	-	-	-	-	-
	1-Mar-98	22.25	211.33	-	-	-	-	-
	1-Sep-98	27.3	206.28	-	-	-	-	-
	1-Mar-99	18.9	214.68	-	-	-	-	-
	1-Aug-99	25.05	208.53	-	-	-	-	-
	1-Mar-00	21.92	211.66	-	-	-	-	-
	1-Sep-00	27.07	206.51	-	-	-	-	-
	1-Mar-01	27.76	205.82	-	-	-	-	-
	1-Aug-02	27.68	205.90	-	-	-	-	-

Table C-1. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (ms/cm)	DO (ppm)	ORP (mv)	Temp ºC
96-A17-5 233.9 (continued)	28-Oct-03	28.3	205.28	-	-	-	-	-
	9-Nov-05	28.47	205.11	-	-	-	-	-
	14-Jun-07	24.47	209.11	-	-	-	-	-
	21-Mar-08	24.48	209.10	-	-	-	-	-
	8-Aug-08	27.93	205.65	-	-	-	-	-
	9-Mar-09	25.71	207.87	-	-	-	-	-
	25-Aug-09	28.03	205.87	-	-	-	-	-
	21-Feb-10	24.29	209.61	-	-	-	-	-
	24-Aug-10	26.66	207.24	-	-	-	-	-
	24-Feb-11	23.26	210.64	-	-	-	-	-
	9-Sep-11	26.15	207.75	-	-	-	-	-
	14-Mar-12	25.7	208.20	-	-	-	-	-
	16-Aug-12	26.01	207.89	-	-	-	-	-
	21-Feb-13	24.28	209.62	-	-	-	-	-
	13-Aug-13	26.93	206.97	-	-	-	-	-
	10-Mar-14	21.85	212.05	-	-	-	-	-
	23-Sep-14	26.66	207.24	-	-	-	-	-
96-A17-6 235.1	1-Feb-96	22.95	209.66	-	-	-	-	-
	1-Mar-01	28.18	204.43	-	-	-	-	-
	28-Oct-03	27.25	205.36	-	-	-	-	-
	9-Nov-05	27.41	205.20	-	-	-	-	-
	14-Jun-07	23.41	209.20	-	-	-	-	-
	21-Mar-08	23.43	209.18	-	-	-	-	-
	8-Aug-08	26.91	205.70	-	-	-	-	-
	9-Mar-09	24.62	207.99	-	-	-	-	-
	25-Aug-09	26.98	208.12	-	-	-	-	-
	21-Feb-10	23.2	211.90	-	-	-	-	-
	24-Aug-10	25.5	209.60	-	-	-	-	-
	25-Feb-11	22.14	212.96	-	-	-	-	-
	9-Sep-11	25.11	209.99	-	-	-	-	-
	14-Mar-12	22.56	212.54	-	-	-	-	-
	16-Aug-12	24.93	210.17	-	-	-	-	-
	21-Feb-13	23.2	211.90	-	-	-	-	-
	13-Aug-13	25.85	209.25	-	-	-	-	-
	10-Mar-14	20.6	214.50	-	-	-	-	-
	23-Sep-14	26.59	208.51	-	-	-	-	-
07-A17-7 233.2	16-Nov-07	27.85	206.20	7.27	0.170	-	-	12.80
	26-Mar-08	24.88	209.17	7.18	0.138	0.79	38.33	12.67
	26-Aug-08	28.33	205.72	7.25	0.161	0.35	-158.25	12.85
	3-Mar-09	26.09	207.96	-	-	-	-	-
	25-Aug-09	28.46	204.74	6.70	0.132	0.23	172	13.20
	21-Feb-10	24.30	208.90	5.82	0.067	0.24	131	11.9
	24-Aug-10	26.71	206.49	5.64	0.132	0.37	76	14.1
	24-Feb-11	23.20	210.00	5.24	0.038	5.66	-	10.6
	9-Sep-11	26.20	207.00	6.05	0.125	1.82	243	16.5
	14-Mar-12	23.63	209.57	-	-	6.8	26	9.5
	16-Aug-12	26.02	207.18	7.34	-	1.06	28	18.6

Table C-1. AOC 9-2 Depth to Water and Groundwater Parameter Measurements (continued)

Well ID TOC Elevation	Date	DTW (ft bgs)	GWELEV (ft AMSL)	pH	Cond. (ms/cm)	DO (ppm)	ORP (mv)	Temp ºC
07-A17-7 233.2 (continued)	21-Feb-13	24.28	208.92	7.48	-	2.49	22	9.9
	13-Aug-13	27.00	206.20	5.97	0.099	0.59	57	13.3
	14-Mar-14	21.45	211.75	5.97	0.059	6.3	46	11.6
	23-Sep-14	26.74	206.46	6.2	0.101	2	2	14
10-A17-8 235.8	29-Nov-10	26.87	208.93	-	-	-	-	-
	25-Feb-11	24.30	211.50	-	-	-	-	-
	9-Sep-11	26.68	209.12	5.82	0.208	1.99	230	16
	18-Nov-11	29.00	206.80	-	-	-	-	-
	14-Mar-12	24.81	210.99	-	-	-	-	-
	16-Aug-12	27.18	208.62	-	-	-	-	-
	21-Feb-13	25.53	210.27	-	-	-	-	-
	13-Aug-13	28.02	207.78	6.6	0.176	0.48	24	13.6
	10-Mar-14	22.85	212.95	6.01	-	2	47	14.7
	22-Sep-14	27.13	208.67	6.4	0.159	4.4	-21	18.9
Duplicate	22-Sep-14	27.13	208.67	6.4	0.159	4.4	-21	18.9

Notes:
[1/] Pump is broken and caught in well. Well casing is possibly bent. Sample collected using a disposable bailer.
TOC – Top of casing
DTW (ft bgs) – Depth to water (feet below ground surface)
GWELEV (ft AMSL) – Groundwater elevation (feet above mean sea level)
Cond. (ms/cm) – Conductivity (microsiemens per centimeter)
DO (ppm) – Dissolved oxygen (parts per million)
ORP (mv) – Oxygen / reduction potential (millivolts)
Temp. (ºC) – Temperature (degrees Celsius)
- – No data, not applicable
New TOC elevations surveyed on 11 June 2010 were used beginning with August 2009 data.

Table C-2. Results of Groundwater Sampling for TPH-G and BTEX Concentrations

Well ID	Date	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
95-A17-1	28-Oct-03	100U	0.5U	0.5U	0.5U	1U
	20-Oct-04	100U	1U	1U	1U	3U
	9-Nov-05	100U	1U	1U	1U	3U
95-A17-2	28-Oct-03	**4,700**	**1.6**	**2.9**	**102**	**184**
	28-Apr-04	200U	**1**	1U	**1**	3U
	20-Oct-04	**760**	**1**	1U	**18**	**2**
	9-Nov-05	**1,900**	1U	**2**	**54**	**67**
	31-Oct-06	100U	1U	1U	1U	3U
	14-Jun-07	500U	1U	1U	1U	3U
	7-Nov-07	**3,000**	1U	**1**	**12**	**12**
	8-Mar-08	500U	1U	1U	1U	3U
	26-Aug-08	500U	1U	1U	1U	3U
	9-Mar-09	500U	1U	1U	1U	3U
	25-Aug-09	500U	1U	1U	1U	3U
	26-Mar-10	50U	1U	1U	1U	3U
	24-Aug-10	No Sample Collected				
	24-Feb-11	50U	1U	1U	1U	3U
	9-Sep-11	50U	1U	1U	1U	3U
	14-Mar-12	50U	1U	1U	1U	2U
	16-Aug-12	50U	1U	1U	1U	2U
	21-Feb-13	250U	0.20U	0.20U	0.20U	0.40U
	13-Aug-13	No Sample Collected				
	10-Mar-14	No Sample Collected				
	22-Sep-14	250U	0.5U	**0.080J**	0.5U	0.5U
95-A17-3A	30-Jun-03	**32,000**	**690**	**1,200**	**1,100**	**4,800**
	28-Oct-03	**10,400**	**200**	**270**	**270**	**1,200**
	28-Apr-04	**23,000**	**600**	**800**	**780**	**3,500**
	20-Oct-04	**8,200**	**160**	**100**	**310**	**740**
	24-May-05	**25,000**	**630**	**650**	**810**	**3,400**
	9-Nov-05	**6,000**	**220**	**170**	**280**	**940**
	14-Jun-06	**29,000**	**490**	**500**	**840**	**4,000**
	31-Oct-06	**26,000**	**590**	**380**	**840**	**3,000**
	14-Jun-07	**30,000**	**310**	**360**	**610**	**2,700**
	7-Nov-07	**30,000**	**360**	**270**	**730**	**2,700**
	8-Mar-08	**35,000**	**410**	**400**	**870**	**3,600**
	26-Aug-08	**17,700**	**175**	**162**	**517**	**1,819**
	9-Mar-09	**31,200**	**399**	**335**	**772**	**2,762**
	25-Aug-09	**27,300**	**209**	**245**	**629**	**2,370**
	22-Feb-10	**25,000**	**320**	**390**	**990**	**3,650**
	24-Aug-10[1/]	**1,300**	**73**	**12**	**42**	**24**
	24-Feb-11	**27,000**	**270**	**350**	**1,100**	**3,970**
	9-Sep-11	**13,000**	**140**	**110**	**480**	**1,620**
	14-Mar-12	**8,700**	**91**	**170**	**350**	**330**

Table C-2. Results of Groundwater Sampling for TPH-G and BTEX Concentrations (continued)

Well ID	Date	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
95-A17-3A (continued)	16-Aug-12	**16,000**	**110**	**240**	**610**	**2,440**
	21-Feb-13	**20,000**	**75**	**190**	**480**	**1,880**
	13-Aug-13[2/]	**21,000**	**92**	**460**	**460**	**2,100**
	14-Mar-14	**15,000**	**36**	**100**	**230**	**1,210**
	23-Sep-14	**1,400**	**3.7**	**15**	**16**	**216**
95-A17-4	28-Oct-03	100U	0.5U	0.5U	0.5U	1U
	20-Oct-04	100U	1U	1U	1U	3U
	9-Nov-05	100U	1U	1U	1U	3U
	14-Jun-07	500U	1U	1U	1U	3U
	8-Mar-08	500U	1U	1U	1U	3U
	26-Aug-08	**300**	1U	1U	1U	3U
	9-Mar-09	500U	1U	1U	1U	3U
	21-Feb-10	50U	1U	1U	1U	3U
	9-Sep-11	50U	1U	1U	1U	3U
	14-Mar-12	50U	1U	1U	1U	2U
	21-Feb-13	250U	0.20U	0.20U	0.20U	0.40U
	14-Mar-14	250U	0.20U	0.20U	0.20U	0.40U
96-A17-5	28-Oct-03	100U	0.5U	0.5U	0.5U	1U
	9-Nov-05	100U	1U	1U	1U	3U
07-A17-7	7-Nov-07	**3,400**	**130**	**6.8**	**130**	**31**
	8-Mar-08	**2,100**	**47**	**3.8**	**120**	**8.3**
	26-Aug-08	**1,990**	**132**	**5.7**	**199**	**4.6**
	25-Aug-09	2,500U	**79.1**	5U	**94.1**	15U
Duplicate	25-Aug-09	2,500U	**79.5**	5U	**95**	15U
	21-Feb-10	50U	**2.5**	1U	1U	3U
	24-Aug-10[1/]	**18,000**	**210**	**220**	**690**	**2,500**
	24-Feb-11	50U	1U	1U	1U	3U
	9-Sep-11	**1,600**	**44**	**15**	**79**	**46**
	14-Mar-12	50U	1U	1U	1U	2U
	16-Aug-12	**150**	**4.7**	**3.9**	1U	3U
	21-Feb-13	250U	0.20U	**1.6**	0.20U	0.40U
	13-Aug-13	250U	**0.6**	**0.85**	0.2U	0.4U
Duplicate	13-Aug-13	250U	**0.57**	**0.63**	**0.25**	0.4U
	14-Mar-14	250U	0.20U	**0.25**	0.20U	0.4U
	23-Sep-14	250U	0.5U	0.5U	0.5U	0.5U
10-A17-8	29-Nov-10	**71,000**	**2,100**	**8,400**	**1,900**	**9,600**
	25-Feb-11	**22,000**	**720**	**1,000**	**490**	**2,220**
Duplicate	25-Feb-11	**21,000**	**730**	**1,100**	**490**	**2,210**
	9-Sep-11	**26,000**	**330**	**300**	**740**	**4,200**
	18-Nov-11	**74,000**	**900**	**6,200**	**2,200**	**11,500**
	14-Mar-12	**19,000**	**710**	**1,300**	**490**	**2,000**
	22-May-12	**13,000**	**630**	**830**	**350**	**2,050**

Table C-2. Results of Groundwater Sampling for TPH-G and BTEX Concentrations (continued)

Well ID	Date	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
10-A17-8 (continued)	16-Aug-12	**59,000**	**1,500**	**3,400**	**1,600**	**8,800**
	21-Feb-13	**34,000**	**1,100**	**2,000**	**640**	**3,700**
	13-Aug-13	**70,000**	**770**	**3,600**	**1,700**	**8,900**
	10-Mar-14	**9,500**	**160**	**330**	**160**	**1,030**
	22-Sep-14	**3,500**	**46**	**90**	**61**	**410**
Duplicate	22-Sep-14	**3,700**	**50**	**110**	**65**	**440**
MTCA Cleanup Level		**800**	**5**	**1,000**	**700**	**1,000**

Notes:
[1/] It is suspected that these samples' labels were switched.
[2/] Sample was labelled as 95-A17-2 by mistake.
TPH-G – Gasoline-range total petroleum hydrocarbons
µg/L – Micrograms per liter
BOLD – Analyte detected above practical quantification limit
BOLD – Analyte detected above MTCA Method A cleanup level
U – Analyte not detected above practical quantification limit reported
- – No data, not applicable

–

APPENDIX D

AIR SAMPLE DATA AND CHAIN OF CUSTODY FORMS

→ SCOTT.ELKINS@SEALASKA.COM

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Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager SCOTT ELKINS

Collected by: (Print and Sign) BOB THOMAS / B. Thomas

Company SEALASKA ENVIRONMENTAL Email SCOTT.ELKINS@SEALASKA.COM

Address P.O. BOX 869 / 18743 FRONT ST, 201 City POULSBO State WA Zip 98370

Phone 360-626-3991 Fax 360-598-3116

Project Info:
P.O. # REQ-2722
Project # 10044.001.015
Project Name JBLM AOC 9-2

Turn Around Time:
☑ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	AOC9-2-141104SVE1000	TEDLAR	11/4/14	1000	TO-15 BTEX, TPH-G				
02A	AOC9-2-141104SVE1300	"	"	1300	" " "				
03A	AOC9-2-141104SVE1530	"	"	1530	" " "				
04A	AOC9-2-141104SVE1800	"	"	1800	" " "				
05A	AOC9-2-141104SVE DUP	"	"	0800	" " "				

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Bob Thomas	11/5/14 1150	[illegible] EAT	11/6/14 1010
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx		NA	Good	(Yes) No None	1411061

Form 1293 rev.11

D-1

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11/20/2014
Mr. Scott Elkind
Sealaska Environmental Services, LLC
18743 Front St NE, Suite 201
PO Box 869
Poulsbo WA 98370

Project Name: JBLM AOC 9-2
Project #: 10044.001.015
Workorder #: 1411061

Dear Mr. Scott Elkind

The following report includes the data for the above referenced project for sample(s) received on 11/6/2014 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1411061

Work Order Summary

CLIENT:	Mr. Scott Elkind Sealaska Environmental Services, LLC 18743 Front St NE, Suite 201 PO Box 869 Poulsbo, WA 98370	**BILL TO:**	Ms. Sandi Walker Sealaska Environmental Services, LLC 13810 SE Eastgate Way Suite 420 Bellevue, WA 98005
PHONE:	360-930-3187	**P.O. #**	REQ-2722
FAX:		**PROJECT #**	10044.001.015 JBLM AOC 9-2
DATE RECEIVED:	11/06/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/20/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AOC9-2-141104SVE 1000	TO-15	Tedlar Bag	Tedlar Bag
01AA	AOC9-2-141104SVE 1000 Lab Duplicate	TO-15	Tedlar Bag	Tedlar Bag
02A	AOC9-2-141104SVE 1300	TO-15	Tedlar Bag	Tedlar Bag
03A	AOC9-2-141104SVE 1530	TO-15	Tedlar Bag	Tedlar Bag
04A	AOC9-2-141104SVE 1800	TO-15	Tedlar Bag	Tedlar Bag
05A	AOC9-2-141104SVE DUP	TO-15	Tedlar Bag	Tedlar Bag
06A	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/20/14

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Sealaska Environmental Services, LLC
Workorder# 1411061

Five 1 Liter Tedlar Bag samples were received on November 06, 2014. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

Method TO-15 is validated for samples collected in specially treated canisters. As such, the use of Tedlar bags for sample collection is outside the scope of the method and not recommended for ambient or indoor air samples. It is the responsibility of the data user to determine the usability of TO-15 results generated from Tedlar bags.

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Surrogates 4-Bromofluorobenzene did not meet in-house generated control limits in samples AOC9-2-141104SVE 1000, AOC9-2-141104SVE 1300, AOC9-2-141104SVE 1530, AOC9-2-141104SVE 1800 and AOC9-2-141104SVE DUP.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141104SVE 1000		
Lab ID:	1411061-01A	**Date/Time Analyzed:**	11/7/14 04:43 PM
Date/Time Collecte	11/4/14 10:00 AM	**Dilution Factor:**	1.00
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msd17.i / 17110713

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	0.74 J
Ethyl Benzene	100-41-4	0.60	1.3	2.2	1.2 J
m,p-Xylene	108-38-3	0.30	1.3	2.2	3.0
o-Xylene	95-47-6	0.45	1.3	2.2	1.2 J
Toluene	108-88-3	0.27	1.1	1.9	7.4
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	170

J = Estimated value.
Q = Exceeds Quality Control limits.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	96
4-Bromofluorobenzene	460-00-4	75-119	121 Q
Toluene-d8	2037-26-5	90-108	99

D-6

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141104SVE 1000 Lab Duplicate		
Lab ID:	1411061-01AA	**Date/Time Analyzed:**	11/7/14 05:06 PM
Date/Time Collecte	11/4/14 10:00 AM	**Dilution Factor:**	1.00
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msd17.i / 17110714

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	0.58 J
Ethyl Benzene	100-41-4	0.60	1.3	2.2	0.83 J
m,p-Xylene	108-38-3	0.30	1.3	2.2	2.7
o-Xylene	95-47-6	0.45	1.3	2.2	0.80 J
Toluene	108-88-3	0.27	1.1	1.9	6.7
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	380

J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	98
4-Bromofluorobenzene	460-00-4	75-119	119
Toluene-d8	2037-26-5	90-108	93

D-7

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141104SVE 1300		
Lab ID:	1411061-02A	**Date/Time Analyzed:**	11/7/14 05:29 PM
Date/Time Collecte	11/4/14 01:00 PM	**Dilution Factor:**	1.00
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msd17.i / 17110715

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	0.54 J
Ethyl Benzene	100-41-4	0.60	1.3	2.2	0.89 J
m,p-Xylene	108-38-3	0.30	1.3	2.2	2.8
o-Xylene	95-47-6	0.45	1.3	2.2	0.78 J
Toluene	108-88-3	0.27	1.1	1.9	8.0
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	410

J = Estimated value.
Q = Exceeds Quality Control limits.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	97
4-Bromofluorobenzene	460-00-4	75-119	122 Q
Toluene-d8	2037-26-5	90-108	95

D-8

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141104SVE 1530		
Lab ID:	1411061-03A	**Date/Time Analyzed:**	11/7/14 05:52 PM
Date/Time Collecte	11/4/14 03:30 PM	**Dilution Factor:**	1.00
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msd17.i / 17110716

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	0.47 J
Ethyl Benzene	100-41-4	0.60	1.3	2.2	0.76 J
m,p-Xylene	108-38-3	0.30	1.3	2.2	2.4
o-Xylene	95-47-6	0.45	1.3	2.2	0.78 J
Toluene	108-88-3	0.27	1.1	1.9	6.9
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	290

J = Estimated value.
Q = Exceeds Quality Control limits.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	96
4-Bromofluorobenzene	460-00-4	75-119	125 Q
Toluene-d8	2037-26-5	90-108	101

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141104SVE 1800		
Lab ID:	1411061-04A	**Date/Time Analyzed:**	11/7/14 06:16 PM
Date/Time Collecte	11/4/14 06:00 PM	**Dilution Factor:**	1.00
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msd17.i / 17110717

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	0.55 J
Ethyl Benzene	100-41-4	0.60	1.3	2.2	0.77 J
m,p-Xylene	108-38-3	0.30	1.3	2.2	2.2
o-Xylene	95-47-6	0.45	1.3	2.2	0.67 J
Toluene	108-88-3	0.27	1.1	1.9	6.7
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	400

J = Estimated value.
Q = Exceeds Quality Control limits.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	96
4-Bromofluorobenzene	460-00-4	75-119	124 Q
Toluene-d8	2037-26-5	90-108	97

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141104SVE DUP		
Lab ID:	1411061-05A	**Date/Time Analyzed:**	11/7/14 06:39 PM
Date/Time Collecte	11/4/14 08:00 AM	**Dilution Factor:**	1.00
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msd17.i / 17110718

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	0.48 J
Ethyl Benzene	100-41-4	0.60	1.3	2.2	0.81 J
m,p-Xylene	108-38-3	0.30	1.3	2.2	2.4
o-Xylene	95-47-6	0.45	1.3	2.2	0.81 J
Toluene	108-88-3	0.27	1.1	1.9	7.4
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	340

J = Estimated value.
Q = Exceeds Quality Control limits.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	97
4-Bromofluorobenzene	460-00-4	75-119	125 Q
Toluene-d8	2037-26-5	90-108	93

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	Lab Blank		
Lab ID:	1411061-06A	**Date/Time Analyzed:**	11/7/14 03:21 PM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17110712a

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.36	0.96	1.6	Not Detected U
Ethyl Benzene	100-41-4	0.60	1.3	2.2	Not Detected U
m,p-Xylene	108-38-3	0.30	1.3	2.2	Not Detected U
o-Xylene	95-47-6	0.45	1.3	2.2	Not Detected U
Toluene	108-88-3	0.27	1.1	1.9	Not Detected U
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	100	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	99
4-Bromofluorobenzene	460-00-4	75-119	94
Toluene-d8	2037-26-5	90-108	99

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	CCV		
Lab ID:	1411061-07A	**Date/Time Analyzed:**	11/7/14 12:45 PM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17110707a

Compound	CAS#	%Recovery
Benzene	71-43-2	100
Ethyl Benzene	100-41-4	99
m,p-Xylene	108-38-3	94
o-Xylene	95-47-6	95
Toluene	108-88-3	91
TPH ref. to Gasoline (MW=100)	9999-9999-038	100

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	100
4-Bromofluorobenzene	460-00-4	75-119	106
Toluene-d8	2037-26-5	90-108	104

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	LCS		
Lab ID:	1411061-08A	**Date/Time Analyzed:**	11/7/14 10:41 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17110703a

Compound	CAS#	%Recovery
Benzene	71-43-2	88
Ethyl Benzene	100-41-4	83
m,p-Xylene	108-38-3	80
o-Xylene	95-47-6	81
Toluene	108-88-3	79
TPH ref. to Gasoline (MW=100)	9999-9999-038	Not Spiked

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	97
4-Bromofluorobenzene	460-00-4	75-119	105
Toluene-d8	2037-26-5	90-108	104

D-14

* % Recovery is calculated using unrounded analytical results.

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC 9-2

Client ID:	LCSD		
Lab ID:	1411061-08AA	**Date/Time Analyzed:**	11/7/14 11:04 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd17.i / 17110704a

Compound	CAS#	%Recovery
Benzene	71-43-2	85
Ethyl Benzene	100-41-4	83
m,p-Xylene	108-38-3	81
o-Xylene	95-47-6	82
Toluene	108-88-3	77
TPH ref. to Gasoline (MW=100)	9999-9999-038	Not Spiked

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	71-122	99
4-Bromofluorobenzene	460-00-4	75-119	105
Toluene-d8	2037-26-5	90-108	103

D-15

* % Recovery is calculated using unrounded analytical results.

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Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager SCOTT ELKIND

Collected by: (Print and Sign) BOB THOMAS/TOM MALAMAKAL

Company SEALASKA ENVIRONMENTAL Email SCOTT.ELKIND@SEALASKA.COM

Address PO BOX 869 18743 FRONT ST NE, 201 City POULSBO State WA Zip 98370

Phone 360-626-3991 Fax 360-598-3116

Project Info:
P.O. # REQ-2722
Project # 10044.001.015
Project Name JBLM AOC9-2

Turn Around Time:
☑ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	AOC9-2-150311SVE 1000	TEDLAR	3/11/15	1000	TO-15 BTEX, TPH-G				
02A	AOC9-2-150311SVE 1300	"	"	1300	" " "				
03A	AOC9-2-150311 SVE 1530	"	"	1530	" " "				
04A	AOC9-2-150311 SVE 1800	"	"	1800	" " "				
05A	AOC9-2-150311 SVE DUP	"	"	1300	" " "				

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Bob Thomas	3/12/15 0800	SAR	3/13/15 1020
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx		NA	Good	Yes No None	1503218

Form 1293 rev.11

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3/26/2015
Mr. Scott Elkind
Sealaska Environmental Services, LLC
18743 Front St NE, Suite 201
PO Box 869
Poulsbo WA 98370

Project Name: JBLM AOC9-2
Project #: 10044.001.015
Workorder #: 1503218

Dear Mr. Scott Elkind

The following report includes the data for the above referenced project for sample(s) received on 3/13/2015 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1503218

Work Order Summary

CLIENT:	Mr. Scott Elkind Sealaska Environmental Services, LLC 18743 Front St NE, Suite 201 PO Box 869 Poulsbo, WA 98370	**BILL TO:**	Ms. Sandi Walker Sealaska Environmental Services, LLC 13810 SE Eastgate Way Suite 420 Bellevue, WA 98005
PHONE:	360-930-3187	**P.O. #**	REQ- 2722
FAX:		**PROJECT #**	10044.001.015 JBLM AOC9-2
DATE RECEIVED:	03/13/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	03/26/2015		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AOC9-2-150311SVE 1000	TO-15	Tedlar Bag	Tedlar Bag
02A	AOC9-2-150311SVE 1300	TO-15	Tedlar Bag	Tedlar Bag
03A	AOC9-2-150311SVE 1530	TO-15	Tedlar Bag	Tedlar Bag
04A	AOC9-2-150311SVE 1800	TO-15	Tedlar Bag	Tedlar Bag
05A	AOC9-2-150311SVE DUP	TO-15	Tedlar Bag	Tedlar Bag
06A	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 03/26/15

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

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(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
DoD QSM 5.0 - TO-15
Sealaska Environmental Services, LLC
Workorder# 1503218

Five 1 Liter Tedlar Bag samples were received on March 13, 2015. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Modifications to DoD QSM 5.0 requirements are listed in the table below.

Requirement	***TO-15 DoD QSM 5.0***	***ATL Modifications***
DoD QSM 5.0 Module 4 (1.7.1.1.j, 1.5.2.1.b, 1.5.2.2.c) Surrogates	Quantification of surrogates requires a multi-point calibration and determination of DL and LOQ.	Quantification achieved using a multipoint calibration at a single concentration, analogous to internal standards. DLs and LOQs are not established.
DoD QSM 5.0 Section 2.2.1 PT Requirement	Two PT samples per year for each analyte-matrix-method combination are required.	Not all analyte-matrix-method combinations on the scope of accreditation are available from the current PT providers.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

Method TO-15 is validated for samples collected in specially treated canisters. As such, the use of Tedlar bags for sample collection is outside the scope of the method and not recommended for ambient or indoor air samples. It is the responsibility of the data user to determine the usability of TO-15 results generated from Tedlar bags.

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Due to laboratory error, the sample duplicate per analytical batch requirement for this project was not met.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	AOC9-2-150311SVE 1000		
Lab ID:	1503218-01A	**Date/Time Analyzed:**	3/18/15 04:53 PM
Date/Time Collecte	3/11/15 10:00 AM	**Dilution Factor:**	2.05
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msdp.i / p031815

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.71	1.3	3.3	Not Detected U
Ethyl Benzene	100-41-4	1.2	1.8	4.4	Not Detected U
m,p-Xylene	108-38-3	0.70	1.8	4.4	5.0
o-Xylene	95-47-6	0.75	1.8	4.4	1.5 J
Toluene	108-88-3	0.90	1.5	3.9	4.6
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	420	Not Detected U

U = The analyte was not detected above the MDL.
J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	101
4-Bromofluorobenzene	460-00-4	79-119	104
Toluene-d8	2037-26-5	87-113	102

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	AOC9-2-150311SVE 1300		
Lab ID:	1503218-02A	**Date/Time Analyzed:**	3/18/15 05:16 PM
Date/Time Collecte	3/11/15 01:00 PM	**Dilution Factor:**	2.05
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msdp.i / p031816

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.71	1.3	3.3	Not Detected U
Ethyl Benzene	100-41-4	1.2	1.8	4.4	1.3 J
m,p-Xylene	108-38-3	0.70	1.8	4.4	6.3
o-Xylene	95-47-6	0.75	1.8	4.4	1.8 J
Toluene	108-88-3	0.90	1.5	3.9	5.3
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	420	Not Detected U

U = The analyte was not detected above the MDL.
J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	102
4-Bromofluorobenzene	460-00-4	79-119	110
Toluene-d8	2037-26-5	87-113	102

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	AOC9-2-150311SVE 1530		
Lab ID:	1503218-03A	**Date/Time Analyzed:**	3/18/15 05:40 PM
Date/Time Collecte	3/11/15 03:30 PM	**Dilution Factor:**	2.05
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msdp.i / p031817

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.71	1.3	3.3	Not Detected U
Ethyl Benzene	100-41-4	1.2	1.8	4.4	Not Detected U
m,p-Xylene	108-38-3	0.70	1.8	4.4	4.9
o-Xylene	95-47-6	0.75	1.8	4.4	1.7 J
Toluene	108-88-3	0.90	1.5	3.9	3.9
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	420	Not Detected U

U = The analyte was not detected above the MDL.
J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	111
4-Bromofluorobenzene	460-00-4	79-119	113
Toluene-d8	2037-26-5	87-113	98

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	AOC9-2-150311SVE 1800		
Lab ID:	1503218-04A	**Date/Time Analyzed:**	3/18/15 06:03 PM
Date/Time Collecte	3/11/15 06:00 PM	**Dilution Factor:**	2.05
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msdp.i / p031818

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.71	1.3	3.3	Not Detected U
Ethyl Benzene	100-41-4	1.2	1.8	4.4	6.0
m,p-Xylene	108-38-3	0.70	1.8	4.4	4.9
o-Xylene	95-47-6	0.75	1.8	4.4	2.1 J
Toluene	108-88-3	0.90	1.5	3.9	7.7
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	420	Not Detected U

U = The analyte was not detected above the MDL.
J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	105
4-Bromofluorobenzene	460-00-4	79-119	109
Toluene-d8	2037-26-5	87-113	103

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	AOC9-2-150311SVE DUP		
Lab ID:	1503218-05A	**Date/Time Analyzed:**	3/18/15 06:27 PM
Date/Time Collecte	3/11/15 01:00 PM	**Dilution Factor:**	2.09
Media:	1 Liter Tedlar Bag	**Instrument/Filename:**	msdp.i / p031819

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.73	1.3	3.3	Not Detected U
Ethyl Benzene	100-41-4	1.2	1.8	4.5	1.9 J
m,p-Xylene	108-38-3	0.71	1.8	4.5	6.1
o-Xylene	95-47-6	0.77	1.8	4.5	3.0 J
Toluene	108-88-3	0.91	1.6	3.9	5.0
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	430	Not Detected U

U = The analyte was not detected above the MDL.
J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	98
4-Bromofluorobenzene	460-00-4	79-119	112
Toluene-d8	2037-26-5	87-113	104

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	Lab Blank		
Lab ID:	1503218-06A	**Date/Time Analyzed:**	3/18/15 11:51 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdp.i / p031806a

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.35	0.64	1.6	Not Detected U
Ethyl Benzene	100-41-4	0.60	0.87	2.2	Not Detected U
m,p-Xylene	108-38-3	0.34	0.87	2.2	Not Detected U
o-Xylene	95-47-6	0.37	0.87	2.2	Not Detected U
Toluene	108-88-3	0.44	0.75	1.9	Not Detected U
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	200	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	107
4-Bromofluorobenzene	460-00-4	79-119	107
Toluene-d8	2037-26-5	87-113	103

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	CCV		
Lab ID:	1503218-07A	**Date/Time Analyzed:**	3/18/15 09:50 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdp.i / p031802a

Compound	CAS#	%Recovery
Benzene	71-43-2	76
Ethyl Benzene	100-41-4	78
m,p-Xylene	108-38-3	79
o-Xylene	95-47-6	80
Toluene	108-88-3	78
TPH ref. to Gasoline (MW=100)	9999-9999-038	100

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	105
4-Bromofluorobenzene	460-00-4	79-119	110
Toluene-d8	2037-26-5	87-113	102

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	LCS		
Lab ID:	1503218-08A	**Date/Time Analyzed:**	3/18/15 10:33 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdp.i / p031803a

Compound	CAS#	%Recovery
Benzene	71-43-2	83
Ethyl Benzene	100-41-4	84
m,p-Xylene	108-38-3	86
o-Xylene	95-47-6	90
Toluene	108-88-3	87
TPH ref. to Gasoline (MW=100)	9999-9999-038	Not Spiked

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	106
4-Bromofluorobenzene	460-00-4	79-119	105
Toluene-d8	2037-26-5	87-113	100

D-28

* % Recovery is calculated using unrounded analytical results.

EPA METHOD TO-15 GC/MS FULL SCAN
JBLM AOC9-2

Client ID:	LCSD		
Lab ID:	1503218-08AA	**Date/Time Analyzed:**	3/18/15 10:57 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdp.i / p031804a

Compound	CAS#	%Recovery
Benzene	71-43-2	82
Ethyl Benzene	100-41-4	86
m,p-Xylene	108-38-3	87
o-Xylene	95-47-6	91
Toluene	108-88-3	89
TPH ref. to Gasoline (MW=100)	9999-9999-038	Not Spiked

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	75-130	107
4-Bromofluorobenzene	460-00-4	79-119	105
Toluene-d8	2037-26-5	87-113	102

D-29

* % Recovery is calculated using unrounded analytical results.

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Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
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Project Manager SCOTT ELKIND

Collected by: (Print and Sign) TOM MALAMAKAL

Company SEALASKA ENVIRONMENTAL Email Scott.ELKIND@SEALASKA.com

Address P.O. BOX 89 18743 FRONT ST 201 City POULSBO State WA Zip 98370

Phone 360-626-3991 Fax 360-598-3116

Project Info:
P.O. # REQ-2722
Project # 10044.001.015
Project Name JBLM AOC 9-2

Turn Around Time:
☑ Normal
☐ Rush
specify

Lab Use Only
Pressurized by:
Date:
Pressurization Gas: N_2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt	Final (psi)
01A	AOC9-2-141106 Conf	35976	11/6/14	0930	TO-15 SIM, TPH-G, BTEX	-30	-8.5		
02A	AOC9-2-141106 Cust	5698	11/6/14	0930	" " " "	-32	-5		
03A	AOC9-2-141106 Lobby	7434	11/6/14	0930	" " " "	-30	-5		
04A	AOC9-2-141106 AAFES	3573	11/6/14	1000	" " " "	-30	-6.5		
05A	AOC9-2-141106 FD	5792	11/6/14	1000	" " " "	-31	-7.5		
06A	AOC9-2-141106 Supply	35978	11/6/14	1000	" " " "	-30	-6.5		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Tom Malamakal	11/7/2014	[signature] FAT	11/8/14 0905
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time
Relinquished by: (signature)	Date/Time	Received by: (signature)	Date/Time

Notes:

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx		NA	Good	Yes / No / None	1411121

Form 1293 rev.11

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11/24/2014
Mr. Scott Elkind
Sealaska Environmental Services, LLC
18743 Front St NE, Suite 201
PO Box 869
Poulsbo WA 98370

Project Name: JBLM AOC 9-2
Project #: 10044.001.015
Workorder #: 1411121

Dear Mr. Scott Elkind

The following report includes the data for the above referenced project for sample(s) received on 11/8/2014 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

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WORK ORDER #: 1411121

Work Order Summary

CLIENT:	Mr. Scott Elkind Sealaska Environmental Services, LLC 18743 Front St NE, Suite 201 PO Box 869 Poulsbo, WA 98370	**BILL TO:**	Ms. Sandi Walker Sealaska Environmental Services, LLC 13810 SE Eastgate Way Suite 420 Bellevue, WA 98005
PHONE:	360-930-3187	**P.O. #**	REQ-2722
FAX:		**PROJECT #**	10044.001.015 JBLM AOC 9-2
DATE RECEIVED:	11/08/2014	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	11/24/2014		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AOC9-2-141106 Conf	Modified TO-15	4.9 "Hg	5 psi
01B	AOC9-2-141106 Conf	Modified TO-15	4.9 "Hg	5 psi
02A	AOC9-2-141106 Cust	Modified TO-15	4.5 "Hg	4.9 psi
02B	AOC9-2-141106 Cust	Modified TO-15	4.5 "Hg	4.9 psi
03A	AOC9-2-141106 Lobby	Modified TO-15	4.9 "Hg	5 psi
03B	AOC9-2-141106 Lobby	Modified TO-15	4.9 "Hg	5 psi
04A	AOC9-2-141106 AAFES	Modified TO-15	3.9 "Hg	4.9 psi
04AA	AOC9-2-141106 AAFES Lab Duplicate	Modified TO-15	3.9 "Hg	4.9 psi
04B	AOC9-2-141106 AAFES	Modified TO-15	3.9 "Hg	4.9 psi
04BB	AOC9-2-141106 AAFES Lab Duplicate	Modified TO-15	3.9 "Hg	4.9 psi
05A	AOC9-2-141106 FD	Modified TO-15	4.7 "Hg	5.1 psi
05B	AOC9-2-141106 FD	Modified TO-15	4.7 "Hg	5.1 psi
06A	AOC9-2-141106 Supply	Modified TO-15	5.3 "Hg	5.1 psi
06B	AOC9-2-141106 Supply	Modified TO-15	5.3 "Hg	5.1 psi
07A	Lab Blank	Modified TO-15	NA	NA
07B	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
08B	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09AA	LCSD	Modified TO-15	NA	NA
09B	LCS	Modified TO-15	NA	NA
09BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 11/24/14

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Sealaska Environmental Services, LLC
Workorder# 1411121

Six 6 Liter Summa Canister (SIM Certified) samples were received on November 08, 2014. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	For Full Scan: 30% RSD with 4 compounds allowed out to < 40% RSD For SIM: Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	For Full Scan: </= 30% Difference with four allowed out up to </=40%.; flag and narrate outliers For SIM: Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

The Chain of Custody (COC) information for sample AOC9-2-141106 Lobby did not match the information on the canister with regard to canister identification. The client was notified of the discrepancy and the information on the canister was used to process and report the sample.

Sample identification for all samples was not provided on the sample tags. Therefore the information on the Chain of Custody was used to process and report the samples.

Analytical Notes

The results for each sample in this report were acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

As per project specific client request, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. All the canisters used for this project have been certified to the Reporting Limit for the target analytes included in this workorder. Concentrations that are below the level at which the canister was certified may be false positives.

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Toluene was manually integrated in the initial calibration for SIM analysis.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Conf		
Lab ID:	1411121-01A	**Date/Time Analyzed:**	11/19/14 02:34 PM
Date/Time Collecte	11/6/14 09:30 AM	**Dilution Factor:**	1.60
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111910

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	65	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	101
4-Bromofluorobenzene	460-00-4	79-121	100
Toluene-d8	2037-26-5	89-108	103

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Conf		
Lab ID:	1411121-01B	**Date/Time Analyzed:**	11/19/14 02:34 PM
Date/Time Collecte	11/6/14 09:30 AM	**Dilution Factor:**	1.60
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111910sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.010	0.020	0.26	0.44
Ethyl Benzene	100-41-4	0.018	0.028	0.14	0.18
m,p-Xylene	108-38-3	0.011	0.028	0.28	0.78
o-Xylene	95-47-6	0.021	0.028	0.14	0.27
Toluene	108-88-3	0.0087	0.024	0.12	1.6

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	103
4-Bromofluorobenzene	460-00-4	84-120	96
Toluene-d8	2037-26-5	89-107	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Cust		
Lab ID:	1411121-02A	**Date/Time Analyzed:**	11/19/14 03:10 PM
Date/Time Collecte	11/6/14 09:30 AM	**Dilution Factor:**	1.57
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111911

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	64	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	102
4-Bromofluorobenzene	460-00-4	79-121	97
Toluene-d8	2037-26-5	89-108	100

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Cust		
Lab ID:	1411121-02B	**Date/Time Analyzed:**	11/19/14 03:10 PM
Date/Time Collecte	11/6/14 09:30 AM	**Dilution Factor:**	1.57
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111911sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.010	0.020	0.25	0.42
Ethyl Benzene	100-41-4	0.018	0.027	0.14	0.26
m,p-Xylene	108-38-3	0.011	0.027	0.27	0.81
o-Xylene	95-47-6	0.020	0.027	0.14	0.29
Toluene	108-88-3	0.0085	0.024	0.12	2.8

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	105
4-Bromofluorobenzene	460-00-4	84-120	100
Toluene-d8	2037-26-5	89-107	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Lobby		
Lab ID:	1411121-03A	**Date/Time Analyzed:**	11/19/14 03:46 PM
Date/Time Collecte	11/6/14 09:30 AM	**Dilution Factor:**	1.60
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111912

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	65	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	101
4-Bromofluorobenzene	460-00-4	79-121	98
Toluene-d8	2037-26-5	89-108	103

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Lobby		
Lab ID:	1411121-03B	**Date/Time Analyzed:**	11/19/14 03:46 PM
Date/Time Collecte	11/6/14 09:30 AM	**Dilution Factor:**	1.60
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111912sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.010	0.020	0.26	0.43
Ethyl Benzene	100-41-4	0.018	0.028	0.14	0.23
m,p-Xylene	108-38-3	0.011	0.028	0.28	0.86
o-Xylene	95-47-6	0.021	0.028	0.14	0.33
Toluene	108-88-3	0.0087	0.024	0.12	1.9

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	104
4-Bromofluorobenzene	460-00-4	84-120	99
Toluene-d8	2037-26-5	89-107	101

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 AAFES		
Lab ID:	1411121-04A	**Date/Time Analyzed:**	11/19/14 04:21 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.53
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111913

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	62	72

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	96
4-Bromofluorobenzene	460-00-4	79-121	100
Toluene-d8	2037-26-5	89-108	100

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 AAFES Lab Duplicate		
Lab ID:	1411121-04AA	**Date/Time Analyzed:**	11/19/14 04:57 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.53
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111914

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	62	72

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	98
4-Bromofluorobenzene	460-00-4	79-121	99
Toluene-d8	2037-26-5	89-108	99

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 AAFES		
Lab ID:	1411121-04B	**Date/Time Analyzed:**	11/19/14 04:21 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.53
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111913sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.0099	0.020	0.24	0.84
Ethyl Benzene	100-41-4	0.018	0.026	0.13	0.60
m,p-Xylene	108-38-3	0.011	0.026	0.26	2.8
o-Xylene	95-47-6	0.020	0.026	0.13	0.96
Toluene	108-88-3	0.0083	0.023	0.12	4.8

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	104
4-Bromofluorobenzene	460-00-4	84-120	100
Toluene-d8	2037-26-5	89-107	101

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 AAFES Lab Duplicate		
Lab ID:	1411121-04BB	**Date/Time Analyzed:**	11/19/14 04:57 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.53
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111914sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.0099	0.020	0.24	0.84
Ethyl Benzene	100-41-4	0.018	0.026	0.13	0.59
m,p-Xylene	108-38-3	0.011	0.026	0.26	2.8
o-Xylene	95-47-6	0.020	0.026	0.13	0.94
Toluene	108-88-3	0.0083	0.023	0.12	4.8

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	103
4-Bromofluorobenzene	460-00-4	84-120	99
Toluene-d8	2037-26-5	89-107	101

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 FD		
Lab ID:	1411121-05A	**Date/Time Analyzed:**	11/19/14 05:32 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.60
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111915

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	65	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	100
4-Bromofluorobenzene	460-00-4	79-121	102
Toluene-d8	2037-26-5	89-108	99

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 FD		
Lab ID:	1411121-05B	**Date/Time Analyzed:**	11/19/14 05:32 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.60
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111915sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.010	0.020	0.26	0.20 J
Ethyl Benzene	100-41-4	0.018	0.028	0.14	0.074 J
m,p-Xylene	108-38-3	0.011	0.028	0.28	0.14 J
o-Xylene	95-47-6	0.021	0.028	0.14	0.049 J
Toluene	108-88-3	0.0087	0.024	0.12	0.36

J = Estimated value.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	104
4-Bromofluorobenzene	460-00-4	84-120	102
Toluene-d8	2037-26-5	89-107	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Supply		
Lab ID:	1411121-06A	**Date/Time Analyzed:**	11/19/14 06:08 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.64
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111916

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	67	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	108
4-Bromofluorobenzene	460-00-4	79-121	100
Toluene-d8	2037-26-5	89-108	101

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	AOC9-2-141106 Supply		
Lab ID:	1411121-06B	**Date/Time Analyzed:**	11/19/14 06:08 PM
Date/Time Collecte	11/6/14 10:00 AM	**Dilution Factor:**	1.64
Media:	6 Liter Summa Canister (SIM Certified)	**Instrument/Filename:**	msdv.i / v111916sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.011	0.021	0.26	0.39
Ethyl Benzene	100-41-4	0.019	0.028	0.14	0.15
m,p-Xylene	108-38-3	0.011	0.028	0.28	0.67
o-Xylene	95-47-6	0.021	0.028	0.14	0.24
Toluene	108-88-3	0.0089	0.025	0.12	1.2

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	109
4-Bromofluorobenzene	460-00-4	84-120	102
Toluene-d8	2037-26-5	89-107	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	Lab Blank		
Lab ID:	1411121-07A	**Date/Time Analyzed:**	11/19/14 12:43 PM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111908c

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	9999-9999-038	NA	D	41	Not Detected U

U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	100
4-Bromofluorobenzene	460-00-4	79-121	100
Toluene-d8	2037-26-5	89-108	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	Lab Blank		
Lab ID:	1411121-07B	**Date/Time Analyzed:**	11/19/14 12:43 PM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111908simc

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	71-43-2	0.0065	0.013	0.16	0.015 J
Ethyl Benzene	100-41-4	0.011	0.017	0.087	Not Detected U
m,p-Xylene	108-38-3	0.0069	0.017	0.17	0.033 J
o-Xylene	95-47-6	0.013	0.017	0.087	0.016 J
Toluene	108-88-3	0.0054	0.015	0.075	0.027 J

J = Estimated value.
U = The analyte was not detected above the MDL.
D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	101
4-Bromofluorobenzene	460-00-4	84-120	98
Toluene-d8	2037-26-5	89-107	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	CCV		
Lab ID:	1411121-08A	**Date/Time Analyzed:**	11/19/14 08:35 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111902c

Compound	CAS#	%Recovery
TPH ref. to Gasoline (MW=100)	9999-9999-038	100

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	97
4-Bromofluorobenzene	460-00-4	79-121	105
Toluene-d8	2037-26-5	89-108	105

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MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	CCV		
Lab ID:	1411121-08B	**Date/Time Analyzed:**	11/19/14 08:35 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111902simc

Compound	CAS#	%Recovery
Benzene	71-43-2	82
Ethyl Benzene	100-41-4	92
m,p-Xylene	108-38-3	99
o-Xylene	95-47-6	101
Toluene	108-88-3	90

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	99
4-Bromofluorobenzene	460-00-4	84-120	104
Toluene-d8	2037-26-5	89-107	102

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	LCS		
Lab ID:	1411121-09A	**Date/Time Analyzed:**	11/19/14 09:16 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111903c

Compound	**CAS#**	**%Recovery**
TPH ref. to Gasoline (MW=100)	9999-9999-038	Not Spiked

D: Analyte not within the DoD scope of accreditation.

Surrogates	**CAS#**	**Limits**	**%Recovery**
1,2-Dichloroethane-d4	17060-07-0	76-127	96
4-Bromofluorobenzene	460-00-4	79-121	106
Toluene-d8	2037-26-5	89-108	104

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	LCSD		
Lab ID:	1411121-09AA	**Date/Time Analyzed:**	11/19/14 09:55 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111904c

Compound	CAS#	%Recovery
TPH ref. to Gasoline (MW=100)	9999-9999-038	Not Spiked

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-127	95
4-Bromofluorobenzene	460-00-4	79-121	101
Toluene-d8	2037-26-5	89-108	102

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	LCS		
Lab ID:	1411121-09B	**Date/Time Analyzed:**	11/19/14 09:16 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111903simc

Compound	CAS#	%Recovery
Benzene	71-43-2	82
Ethyl Benzene	100-41-4	91
m,p-Xylene	108-38-3	98
o-Xylene	95-47-6	99
Toluene	108-88-3	90

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	98
4-Bromofluorobenzene	460-00-4	84-120	104
Toluene-d8	2037-26-5	89-107	103

D-55

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN
JBLM AOC 9-2

Client ID:	LCSD		
Lab ID:	1411121-09BB	**Date/Time Analyzed:**	11/19/14 09:55 AM
Date/Time Collecte	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdv.i / v111904simc

Compound	CAS#	%Recovery
Benzene	71-43-2	81
Ethyl Benzene	100-41-4	87
m,p-Xylene	108-38-3	89
o-Xylene	95-47-6	89
Toluene	108-88-3	87

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	76-129	99
4-Bromofluorobenzene	460-00-4	84-120	99
Toluene-d8	2037-26-5	89-107	102

* % Recovery is calculated using unrounded analytical results.