2020 ANNUAL REMEDIAL OPERATIONS AND GROUNDWATER MONITORING REPORT

Former International Paper Facility
Port of Longview
Longview, Washington

Prepared for

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This annual report presents a summary of both groundwater monitoring activities and remediation operations conducted during the year 2020 at the former International Paper Company (International Paper) facility located in Longview, Washington.

This report includes information collected during the twenty-second year of annual Performance and Compliance Monitoring in conformance with the 1997 Performance and Compliance Monitoring Plan (PCMP). This report addresses monitoring requirements of the PCMP, compliance monitoring requirements of the Washington Administrative Code (WAC) 173-340-410(1)(b) and (c), and post-closure care monitoring requirements of WAC 173-303-610(7). The PCMP program is being performed to comply with Consent Decree 972010889 (1997) between International Paper and the Washington State Department of Ecology (Ecology).

Remediation operations and performance monitoring are also summarized in this report for both the Treated Wood Products (TWP) Area and the Maintenance Facility Area (MFA). Active remediation operations were discontinued in the TWP Area after aerobic biosparging operations reduced concentrations of chemicals of concern (COCs) to an asymptotic minimum. Four groundwater monitoring wells (AV-01, AV-02, AV-06, and AV-08) were monitored within the TWP Area to evaluate COC concentrations under anaerobic conditions in September 2020. A biosparging/bioventing remediation system was operated in the MFA between June 2002 and June 2008. Six groundwater monitoring wells (AV-09 through AV-13 and 99-EA3A) and two PCMP wells (04-6A and 97-6B) were monitored within the MFA to assess COC concentrations in April and September 2020.

The fifth annual groundwater PCMP report presented an evaluation of the first 5 years of monitoring data. Based upon this information, International Paper and Ecology determined that future PCMP monitoring would include annual groundwater sampling and analysis of diesel-range total petroleum hydrocarbons (diesel), and the polycyclic aromatic hydrocarbons (PAHs) naphthalene, benzo(a)anthracene, chrysene, 2-methylnaphthalene, dibenzofuran, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene in wells 97-6A (replaced by well 04-6A in 2004) and 97-6B. The report also recommended retaining wells 97-1A (a downgradient well to the north-northeast), 97-3A (the interior sentry well), 97-5A (to bracket the impacted area northwest of the barrier wall), and LL-01.15 (eastern upgradient well) for monitoring of indicator analytes at a frequency of once every five years. This monitoring approach was approved by Ecology in a March 2004 letter to International Paper. All six PCMP wells were monitored in September 2008, 2013, and 2018 and the tenth, fifteenth, and twentieth annual groundwater PCMP reports all recommended continuing the monitoring program using the same analytes and frequencies. All six PCMP wells will be monitored again in September 2023.

Light non-aqueous-phase liquid (LNAPL) was detected in trace amounts in two temporary groundwater monitoring wells (TMP-04 and TMP-05) in April 2020. LNAPL was not observed in any site groundwater monitoring wells in September 2020. Recoverable dense NAPL (DNAPL) was detected in MFA bioventing wells BV-13 and 04-6A during 2020. Recovered DNAPL quantities in wells BV-13 and 04-6A were slightly greater than in 2019. Analytical results for groundwater samples collected during 2020 are presented in this report and are compared to applicable regulatory criteria in data summary tables.

Depth to groundwater was measured in April and September 2020. Groundwater elevation tables and potentiometric contour maps for those events are provided in this report. Groundwater flow was inferred to be generally to the north-northeast during 2020, consistent with historic monitoring events.

Based on the groundwater monitoring conducted in 2020, the subsurface barrier wall continues to provide an effective barrier to contaminant migration from the former TWP Area.

This annual report presents a summary of remediation operations and groundwater monitoring activities conducted during the year 2020 at the former International Paper Company (International Paper) facility located in Longview, Washington. Operation and maintenance activities are being conducted at the site in accordance with the As-Built Report and Operation and Maintenance Manual (URS, 2003a). Groundwater monitoring (performance and compliance) activities are being conducted in accordance with the Performance and Compliance Monitoring Plan (PCMP)(Woodward-Clyde, 1997a).

The PCMP monitoring program is being performed in accordance with Consent Decree 972010889 (1997) between the Washington State Department of Ecology (Ecology) and International Paper. In addition, this report includes data required by Washington Administrative Code (WAC) 173-340-410(1)(b) and (c), and data required in post-closure care monitoring (WAC 173-303-610(7)).

This report presents a summary of the twenty-second year of annual long-term performance confirmation and groundwater compliance monitoring, as required by the PCMP. AECOM Technical Services, Inc. (AECOM) prepared this report on behalf of International Paper.

1.1 SITE LOCATION AND DESCRIPTION

The former International Paper Longview facility is located in Sections 8.0 and 9.0, Township 7 North, Range 2 West, Cowlitz County, in Longview, Washington. The facility is located on the north side of the Columbia River, approximately 66 miles upriver from the Pacific Ocean and less than 2 miles downstream (west) of the confluence of the Columbia and Cowlitz Rivers. The facility lies within a 100-year floodplain and is protected by control levees. The site area is relatively level and ranges in elevation from 10 to 15 feet above mean sea level (ft msl).

Property including the former Treated Wood Products (TWP) Area measuring approximately 20 acres and was purchased by the Port of Longview in 1999 (Figure 1-1). Additional Port of Longview property borders the TWP Area on all sides. Port of Longview maintenance operations border the former TWP Area to the northwest in the Maintenance Facility Area (MFA), a paved storage yard is located to the north, and vacant Port of Longview property is located to the northeast. The Columbia River is located approximately 300 feet southwest of the southwest corner of the former TWP Area.

1.2 SITE BACKGROUND

Between 1937 and 1982 wood treatment operations were conducted in the TWP Area. Operations were discontinued in 1982, impacted surface soils were excavated from specific locations in 1985, and an impermeable cover system that included a high-density polyethylene (HDPE) liner capped the TWP Area in 1989. Subsequent cleanup actions were later implemented in the TWP Area to ensure long-term protection of human health and the environment in an industrial setting. These cleanup actions are described in the engineering design report (EDR) prepared for the groundwater containment system at the former TWP Area (Woodward-Clyde 1997b). Some of the specific cleanup actions taken included the physical containment of contaminants by construction of a subsurface barrier wall and engineered cover system, removal of light non-aqueous-phase liquids (LNAPL) within the contained area, and *in situ* treatment of contaminants using a combined system of biosparging wells and bioventing

wells. These actions, including the construction of the TWP Area treatment system (Figure 1-2), were implemented in 1997 and 1998. Biosparging operations in the TWP Area were discontinued in October 2001 when chemical of concern (COC) concentrations decreased to an asymptotic minimum. Ecology approved the Remediation System Decommissioning Work Plan (URS, May 2006) for the TWP Area, and the following 25 TWP Area well points/monitoring wells were decommissioned on February 28 and March 1, 2007 (URS, April 2007):

- 11 bioventing wells (BV-01 through BV-11);
- 8 air sparging wells (AS-01 through AS-08);
- 4 aquifer venting/monitoring wells (AV-03, AV-04, AV-05, and AV-07); and
- 2 bioventing monitoring points (BVP-01 and BVP-02).

Construction of an additional biosparging/bioventing system (Figure 1-3) was completed in the MFA in June 2002 (URS, 2003a). Due to the presence of perched water above the Upper Silt, the bioventing (BV) portion of the system was reconfigured to operate in a biosparging mode in addition to the other air sparging (AS) portion of the system. Biosparging operations in the MFA began in June 2002 using the three horizontal AS wells (AS-09, AS-10, and AS-11), four vertical BV wells (BV-12, BV-13, BV-14, and BV-15), and one horizontal BV well (BV-16). The reconfigured BV blower failed in November 2007 and has remained off with the concurrence of Ecology (December 17, 2007). The AS compressor failed in June 2008 and has also remained off with the concurrence of Ecology (July 2, 2008). Aerobic operations were discontinued after six years (June 2002 to June 2008) because:

- groundwater quality at the MFA area perimeter groundwater monitoring wells generally continued to meet MTCA Method B cleanup levels throughout the pilot test period (with the exception of occasional polycyclic aromatic hydrocarbon (PAH) exceedances that appear to be non-representative of dissolved groundwater concentrations as demonstrated by field filtering in site wells), and
- additional groundwater quality improvements were not anticipated at the MFA area interior groundwater monitoring wells with continued operation of the biosparging pilot test system based upon historical results and trend analysis.

An additional investigation was conducted within the MFA during September 2008 to collect soil and groundwater samples from new site locations. A total of 29 push probe borings were advanced and continuously sampled, and a total of 12 temporary monitoring wells (TMWs) were installed for future groundwater monitoring. The field data and results from the temporary wells and this additional investigation sampling were presented to Ecology in a Draft Revised Remedial Investigation / Feasibility Study (RI/FS) report on May 13, 2011 (URS, 2011).

The Port of Longview filled a portion of the TWP area southwest of the barrier wall during the summer of 2009. Well completions for wells 97-3A and LL-01.15 were extended to the new (higher) surface elevation of the filled area.

A vapor intrusion assessment was conducted in December 2009 and results were reported separately to Ecology in February 2010 (URS, 2010).

In accordance with the In-Situ Soil Stabilization Treatability Testing Work Plan (URS, 2012a), two test pits were excavated within the MFA for the purpose of collecting soil samples and testing them using various in-situ soil stabilization admixtures against strength, permeability, and

leachability criteria. Field data and treatability testing results were provided to Ecology separately in a draft report that was issued in December 2012.

In accordance with the Mechanics Shop Investigation Work Plan (URS, 2012b), a supplemental investigation was conducted near and within the Port of Longview's Mechanics Shop during December 2011 to collect soil samples from 14 additional locations within the Upper Sand. The field data and soil sampling results were provided to Ecology separately in a final report issued in April 2012.

The RI/FS report was subsequently revised to incorporate additional information and Ecology comments. The revised document was submitted to Ecology as a public review draft on July 12, 2016 (AECOM, 2016). A public comment period regarding the public review draft RI/FS report was conducted between August 17, 2017 and October 2, 2017. A public hearing was held at the Cowlitz County Event Center on September 28, 2017. Ecology issued a transcript containing public comments, a responsiveness summary, and a public participation plan in July 2018. In a letter to International Paper dated August 1, 2018, Ecology transmitted conditional approval of the draft 2016 RI/FS report with an addendum that included, correspondence, and attachments containing comments on the RI/FS alternatives and an additional Port of Longview alternative. In an e-mail to International Paper dated January 14, 2020, Ecology transmitted a Draft Final Cleanup Action Plan (dCAP) dated December 17, 2019 that identified a selected remedy that includes limited soil excavation, removal, off-site disposal, and *in situ* solidification for soil, and chemical oxidation and monitored natural attenuation for groundwater. Ecology issued the dCAP for public comment on January 18, 2021.

Performance monitoring summarized in this report includes monitoring of the groundwater quality both inside and outside of the TWP containment area to verify the integrity of the subsurface barrier wall. It also includes monitoring groundwater quality in the MFA to evaluate conditions in that area.

Compliance monitoring summarized in this report consists of monitoring groundwater quality at the point of compliance as outlined in the PCMP. The point of compliance for the former TWP Area is considered to be the boundary of the proposed deed restricted portion of that area (Figure 1-4).

1.3 SITE GEOLOGY AND HYDROGEOLOGY

Native soils are chiefly poorly graded fine to medium sands with layers of silt occurring at three distinct depths. In the vicinity of the TWP Area, the Upper Silt is located approximately 10 feet below ground surface (bgs), the Intermediate Silt is located approximately 40 feet bgs, and the Lower Silt is located at approximately 100 feet bgs. Two groundwater units are located between these silt layers. Aquifer A is located between the Upper Silt and the Intermediate Silt. Aquifer B is located between the Intermediate Silt and the Lower Silt. Previous investigations have shown that groundwater potentiometric heads fluctuate due to both tidal and seasonal influences, but that groundwater generally flows toward the north-northeast (Woodward-Clyde 1996).

1.4 TWP AREA CLEANUP ACTION DESCRIPTION

The EDR (Woodward-Clyde 1997b) identified the following as goals of the TWP Area cleanup action:

Physical containment of dissolved and free-phase COCs within facility boundaries;
Removal of LNAPL, to the extent practicable;
Removal of dense non-aqueous phase liquid (DNAPL) from the top of the Upper Silt, if present, to the extent practicable;
Treatment of COCs in place, to the extent practicable, to reduce mobility;
Institutional controls (i.e. deed restrictions) to limit intrusive activities in areas of impacted soil and groundwater and to protect the containment and treatment systems; and
Long-term monitoring to document progress in achieving cleanup goals.
The following three systems were implemented in the TWP Area to achieve the above goals:

A soil-bentonite barrier wall containment system around the TWP Area,
A biosparging/bioventing treatment system within the barrier wall, and
An impervious cover system over the contained area.
The soil-bentonite barrier wall containment system was constructed within a trench that was approximately 3 feet wide and 40 feet deep. The wall is keyed into the Intermediate Silt in order to contain the impacted area within low permeability materials on all sides.

The TWP Area biosparging/bioventing treatment system was constructed using 8 biosparging and aquifer venting well pairs screened within Aquifer A, and 11 bioventing wells screened above the Upper Silt. The bioventing wells were designed to allow passive venting of shallow soils and the aquifer venting wells were designed to allow passive venting of Aquifer A during biosparging. This treatment system operated between October 1998 and October 2001.

The cover system was constructed of a 30-mil polyvinyl chloride (PVC) geomembrane liner that was covered by a 1-foot thick drainage rock layer, a separation geotextile fabric, and a 1-foot thick vegetated topsoil layer.

An active LNAPL recovery system was installed on March 3, 1999 to recover free-phase floating product observed in biosparging well AV-06. The system was removed on March 4, 2003 following an extended period of monitoring (since August 1999) with no observed recoverable product. A total of approximately 8.3 gallons of LNAPL were recovered from well AV-06 (Appendix A, Table A-8).

1.5 MFA TREATMENT SYSTEM DESCRIPTION

The Additional Action Work Plan (URS, 2002) identified *in situ* treatment of COCs in the MFA using a biosparging/bioventing treatment system. The MFA biosparging/bioventing treatment system consists of:

three horizontal biosparging wells and five groundwater monitoring/venting wells screened within Aquifer A below the Upper Silt, and
one horizontal and four vertical bioventing wells screened above the Upper Silt, which were converted to additional biosparging wells at system start-up in June 2002 due to observed groundwater conditions.

This treatment system operated between June 2002 and June 2008. The groundwater monitoring/venting wells previously allowed venting of Aquifer A during biosparging operations and continue to provide locations for monitoring of MFA groundwater conditions.

1.6 TREATMENT SYSTEMS OPERATION AND MAINTENANCE

Construction related to the TWP Area cleanup action was completed in 1998. The biosparging/ bioventing system was started in October 1998. Treatment system O&M activities have been conducted monthly in the TWP Area since the system was started. Groundwater performance monitoring was conducted quarterly for two years following system start-up and then annually thereafter in accordance with the PCMP (Woodward-Clyde 1997a) through February 2002. In March 2002, Ecology approved a recommendation to convert operations in the TWP Area from an aerobic treatment mode to an anaerobic treatment mode. All biosparging and bioventing well connections to ambient air were sealed off and sampling frequency in the TWP Area was increased to include semi-annual events. Ecology approved the Remediation System Decommissioning Work Plan for the TWP Area (URS, May 2006), and all TWP Area treatment system wells (not equipment) with the exception of aquifer venting wells AV-01, AV-02, AV-06, and AV-08 were decommissioned on February 28 and March 1, 2007.

The MFA biosparging/bioventing system was started in June 2002. O&M activities during the first year included monthly site visits, quarterly subsurface monitoring events, and semi-annual groundwater performance monitoring events that coincided with O&M activities in the TWP Area. O&M activities in subsequent years have included monthly site visits and semi-annual groundwater performance monitoring for both the MFA and TWP Area. Due to an increase in PAH concentrations in some site wells, Ecology requested that groundwater performance monitoring be increased to quarterly in 2007. Semi-annual monitoring was resumed during 2008 and has continued through 2020.

1.7 PERFORMANCE AND COMPLIANCE MONITORING PROGRAM

The fifth annual groundwater PCMP report (URS, 2003b) presented an evaluation of the first 5 years of monitoring data. Based upon this information, International Paper and Ecology determined that PCMP monitoring would be modified to include annual groundwater sampling and analysis of diesel-range total petroleum hydrocarbons (diesel), and the PAHs naphthalene, benzo(a)anthracene, chrysene, 2-methylnaphthalene, dibenzofuran, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene in groundwater monitoring wells 97-6A and 97-6B. In addition, wells 97-1A (a downgradient well to the north-northeast), 97-3A (the interior sentry well), 97-5A (to bracket the impacted area northwest of the barrier wall), and LL-01.15 (eastern upgradient well) would be monitored for indicator analytes on a five-year frequency. The tenth annual groundwater PCMP report (URS, 2009), fifteenth annual groundwater PCMP report (URS, 2014), and twentieth annual groundwater PCMP report (AECOM, 2019) all recommended continued monitoring using the same analytes and frequencies.

During a semi-annual sampling event in March 2004, well 97-6A was observed to be damaged and well 97-6A was subsequently closed in place and replaced with well 04-6A on May 11, 2004 as approved by Ecology. Ecology also approved International Paper's October 28, 2004 request to abandon 11 PCMP wells (shallow wells LL.18.22, 97-2A, 97-4A, 97-8A, 97-9A, 97-10A, and

deep wells 97-1B, 97-2B, 97-4B, 97-5B, 97-7B) on December 20, 2004, and these wells were abandoned in place in April 2005.

This twenty-second annual groundwater monitoring report includes data from groundwater samples collected from the following two PCMP wells during April and September of 2020 (Figure 1-4):

One well installed as a PMCP well in July 1998 (97-6B), and
One well installed to replace damaged PCMP well 97-6A in March 2004 (04-6A).

As discussed in the PCMP (Woodward-Clyde, 1997a), Model Toxics Control Act (MTCA) Method C (Ecology 1996) groundwater cleanup levels are the long-term cleanup goals for groundwater within the proposed deed-restricted portion of the former TWP Area, and MTCA Method B cleanup levels are the long-term cleanup goals for groundwater beyond the point of compliance. MTCA Method B or C cleanup values have not been established for total petroleum hydrocarbons (TPH); therefore, to be conservative, the MTCA Method A cleanup level was stipulated as the long-term cleanup goal for TPH both within and beyond the point of compliance. The COCs and the corresponding cleanup goals as identified in the PCMP are listed in Table 1-1.

During the evaluation of data acquired through the additional investigation conducted within the MFA in 2008, Ecology recommended that International Paper begin incorporating recent MTCA updates into the data evaluation process at the site. Thus, data acquired from 2008 forward have been compared both to the historical values incorporated into the Consent Decree and PCMP as well as updated MTCA reference values (Appendix A, Table A-10). The Total Toxic Equivalent Concentration (TTEC) criterion was added for evaluation of cPAHs in 2008. A sample's TTEC value is calculated by summing the seven individual cPAH concentrations after they have been multiplied by their respective toxicity equivalency factors (TEFs) in accordance with WAC 173-340-708(8)(e). This TTEC value is then compared to the associated MTCA B/C cleanup level for benzo(a)pyrene (Appendix A, Table A-10).

Table 1-1

GROUNDWATER PCMP CLEANUP GOALS FOR CHEMICALS OF CONCERN

Chemicals of Concern	CLEANUP GOALS (ppb)	
	Compliance Goal MTCA B (1996)	Performance Goal MTCA C (1996)
Polycyclic Aromatic Hydrocarbons (PAHs)		
Acenaphthene	960	2,100
Anthracene	4,800	10,500
Benzo(a)anthracene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Benzo(a)pyrene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Benzo(b)fluoranthene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Benzo(k)fluoranthene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Chrysene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Dibenzo(a,h)anthracene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Indeno(1,2,3-cd)pyrene	0.012 0.13 (PQL)[b]	0.012 0.13 (PQL)[b]
Benzo(g,h,i)perylene	480[c]	1,050[c]
Carbazole	4.37	43.8
Dibenzofuran	64[d]	140[d]
Fluoranthene	640	1,400
Fluorene	640	1,400
2-Methylnaphthalene	320[e]	700[e]
Naphthalene	320	700
Phenanthrene	480[c]	1,050[c]
Pyrene	480	1,050
Other COCs[a]		
Pentachlorophenol	0.729	7.29
TPH – diesel/oil	1,000[f]	1,000[f]

[a] Chemicals of concern selected for continued PCMP well monitoring following the first five years of monitoring are shown in **bold**.

[b] Practical Quantitation Limit (PQL), Method 8310 (SW-846) will be used as the cleanup goal based on WAC 173-340-700(6) and WAC 173-340-707(2).

[c] Cleanup goal based on value for pyrene

[d] Cleanup goal calculated based on a provisional oral RfD of 0.004 mg/kg day available from the EPA National Center for Environmental Assessment, Superfund Health Risk Technical Support Center (cited in EPA Region III RBC table) and MTCA B and C formulas. Source: Ecology 1996

[e] Cleanup goal based on value for naphthalene

[f] Cleanup levels are based on the MTCA Method A cleanup standards

2018 Aerial Photograph Source: Google Earth

0 250 500
SCALE IN FEET

Legend
- Lights
- Utility/Power Pole
- Road
- Railroad
- Ditch
- Fence

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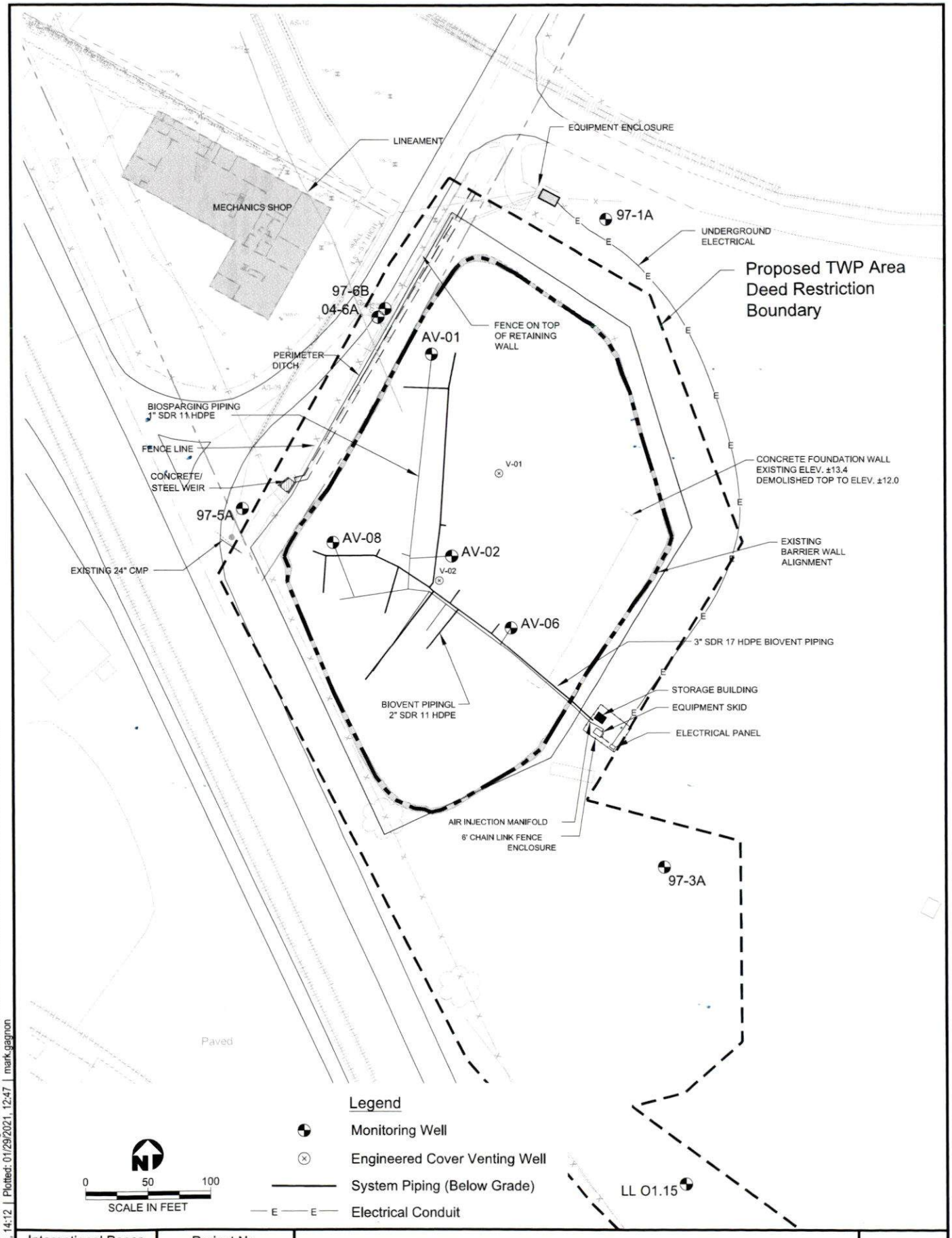
International Paper Longview, WA	Project No. 60642130	Former International Paper Facility Layout	Figure 1-1
AECOM			



International Paper Longview, WA	Project No. 60642130	Well and Piping Layout - TWP Area	Figure 1-2
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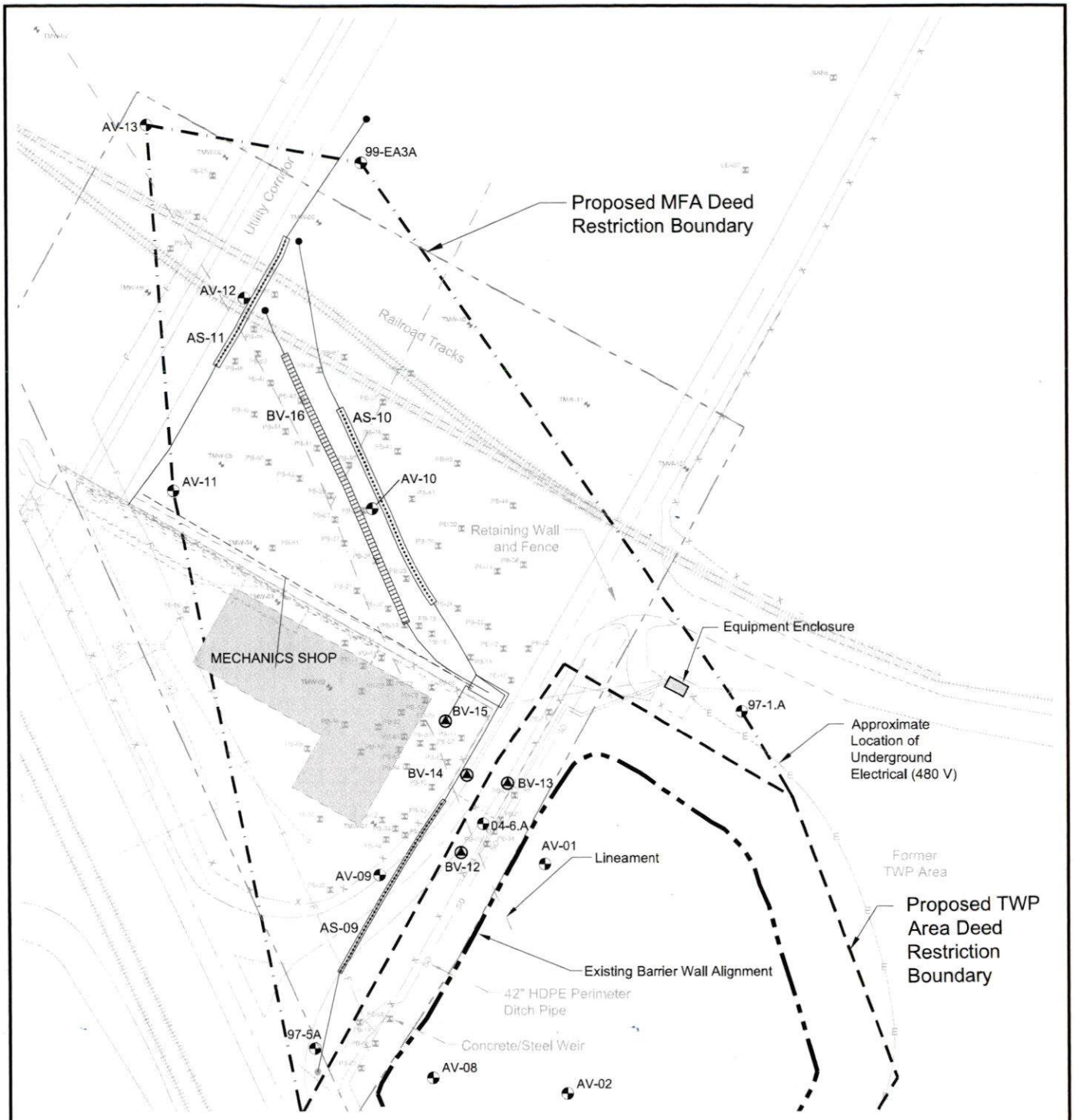

Legend

- Horizontal Bioventing Well
- Horizontal Biosparging Well
- Underground Piping
- Above-Ground Piping
- Horizontal Well Termination Vault
- Groundwater Monitoring Well
- Vertical Bioventing Well
- Direct Push Boring

NT

0 50 100

SCALE IN FEET

	Screen Length	Blank to North	Blank to South
AS-11	100 FT	110 FT	110 FT
AS-10	150 FT	132 FT	81 FT
BV-16	200 FT	40 FT	80 FT
AS-09	140 FT	110 FT	80 FT
Road Boring	-	120 FT	-

International Paper Longview, WA	Project No. 60642130	Figure 1-3
AECOM	Well and Piping Layout - MFA	

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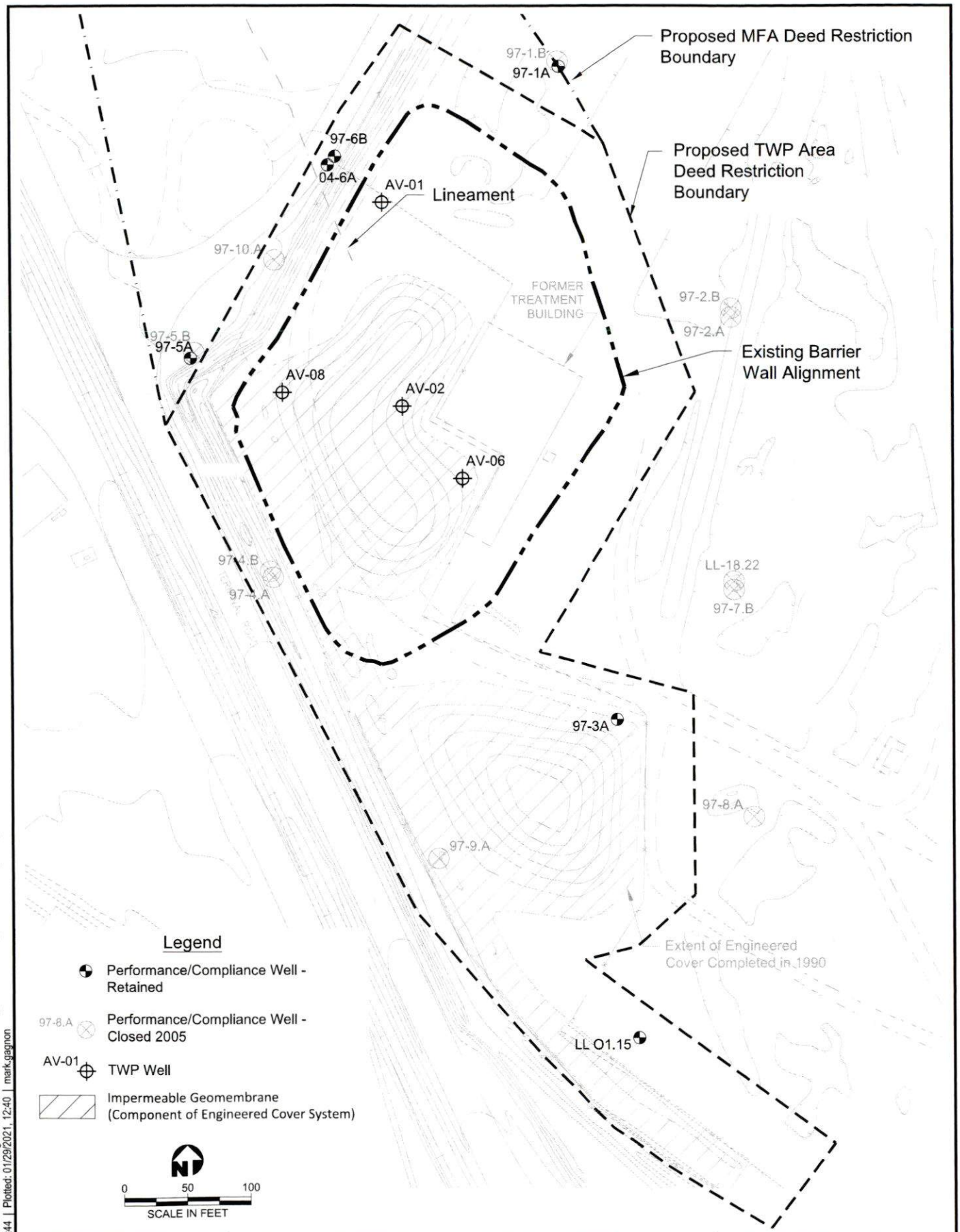

International Paper Longview, WA	Project No. 60642130	Performance and Compliance Monitoring Well Locations for the Former TWP Area	Figure 1-4
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2.1 REMEDIATION SYSTEM OPERATION AND MAINTENANCE

The MFA biosparging/bioventing system operated as designed for approximately six years. A BV system blower failure was discovered on a monthly maintenance visit on November 29, 2007 and the BV system has remained off with the concurrence of Ecology (December 17, 2007). An AS system compressor failure was discovered on a monthly maintenance visit on June 30, 2008 and the AS system has remained off with the concurrence of Ecology (July 2, 2008). The TWP Area biosparging/bioventing system was not operated after October 2001, and wells associated with this system were decommissioned on February 28 and March 1, 2007. Well maintenance activities as well as mowing and other site maintenance activities are conducted in accordance with the As-Built Report and O&M Manual (URS, 2003a).

O&M monitoring events were conducted monthly during 2020. Activities performed during these monthly events included:

Inspection and maintenance of site fencing, locks, warning signs, roads, and drainage systems;
Inspection and maintenance of MFA biosparging/bioventing building, equipment, and wells;
Inspection and maintenance of the TWP Area cover system and wells; and
Monitoring of product in site wells and extraction of product if present.

Monthly remediation system equipment and monitoring well observations are documented in Table A1 through Table A9 provided in Appendix A. Monthly site observations are documented on the Post Construction Inspection Report Forms provided in Appendix B. Mowing of the TWP cover system was conducted on July 16, 2020.

2.2 GROUNDWATER MONITORING AND SAMPLE COLLECTION

Semi-annual groundwater sampling of specific MFA, TWP Area, and PCMP wells was conducted on April 1-2 and September 14-15, 2020. Activities performed during these events included:

Monitoring of groundwater elevations and water quality parameters in biosparging/bioventing system wells and in groundwater monitoring/venting wells, and
Sampling of groundwater in groundwater monitoring/venting wells.

Six MFA groundwater monitoring wells (AV-09, AV-10, AV-11, AV-12, AV-13, and 99-EA3A) and two PCMP groundwater monitoring wells (04-6A and 97-6B) were sampled in April and September 2020. Four TWP wells (AV-01, AV-02, AV-06, and AV-08) were also monitored in September 2020.

All semi-annual and annual groundwater monitoring field and laboratory activities were performed according to the protocols presented in the PCMP Field Sampling Plan and Quality Assurance Project Plan, as summarized below.

Prior to sampling, groundwater monitoring wells were inspected for the presence of NAPL. Following these measurements, the depth to water and total depth in each well were measured. Groundwater monitoring wells were sampled using low-flow sampling techniques. Dedicated tubing was used for each well during sampling. Water quality parameters, including temperature, pH, specific conductance, turbidity, dissolved oxygen, and redox potential were measured continually during purging to assure stable, representative conditions prior to sampling.

Groundwater elevation and water quality parameter observations were recorded on groundwater sampling data sheets provided in Appendix C.

Samples were placed in containers provided by the Ecology-accredited analytical laboratory. A label identifying the well number, date, type of sample, and name of collector was placed on each sample. Samples were kept chilled on ice after sampling and were delivered to ALS Environmental (ALS) of Kelso, Washington for analysis. All sample handling, storage, and transport was conducted under chain-of-custody protocol. Quality control samples collected in the field included a duplicate sample. The chain-of-custody forms and laboratory analytical results are presented in Appendix D.

Purge water generated during the sampling events was contained in 55-gallon drums stored in an enclosed secondary containment area, which is kept covered with a fitted rainproof tarp.

2.3 LABORATORY ANALYSES

Groundwater samples collected from PCMP wells 04-6A and 97-6B were analyzed for the following COCs and analytical methods:

PARAMETER	ANALYTICAL METHOD
Benzo(a)anthracene	EPA 8270 Selected Ion Monitoring
Benzo(a)pyrene	EPA 8270 Selected Ion Monitoring
Benzo(b)anthracene	EPA 8270 Selected Ion Monitoring
Benzo(k)anthracene	EPA 8270 Selected Ion Monitoring
Chrysene	EPA 8270 Selected Ion Monitoring
Dibenzo(a,h)anthracene	EPA 8270 Selected Ion Monitoring
Indeno(1,2,3-cd)pyrene	EPA 8270 Selected Ion Monitoring
Dibenzofuran	EPA 8270 Selected Ion Monitoring
2-Methyl Naphthalene	EPA 8270 Selected Ion Monitoring
Naphthalene	EPA 8270 Selected Ion Monitoring
TPH-diesel	NWTPH-Dx

Notes:
EPA = U.S. Environmental Protection Agency
NWTPH-Dx = Northwest total petroleum hydrocarbons as diesel (extended) – Ecology method

Groundwater samples collected from all other performance monitoring wells (AV wells and 99-EA3A) and TWP wells (AV-01, AV-02, AV-06, and AV-08) were analyzed for the same COCs listed for wells 04-6A and 97-6B above, as well as the following additional analytes and analytical methods:

PARAMETER	ANALYTICAL METHOD
Heterotrophic Plate Count	SM9215B
Hydrocarbon Degrading Bacteria	SM9221C
Nitrite/Nitrate as N	EPA 353.2
Total Phosphorus	EPA 365.1
Sulfate	EPA 300.0
Total Organic Carbon	EPA 415.1
Polycyclic Aromatic Hydrocarbons (PAHs)	EPA 8270 Selected Ion Monitoring

Notes:
EPA = U.S. Environmental Protection Agency
SM = Standard Method

Following the receipt of laboratory analytical data, AECOM conducted quality assurance reviews of that data. Summaries of these reviews are provided in Appendix E.

Results of field and laboratory activities described in Section 2 of this report are discussed below.

3.1 REMEDIATION SYSTEM OPERATION AND MAINTENANCE

Historic and current biosparging/bioventing system operation and maintenance monitoring results are summarized in tables presented in Appendix A:

- Depth to water measurements, product thicknesses, and water quality monitoring results are presented in Table A-1 (for biosparging wells) and Table A-2 (for bioventing wells)
- Previous vapor monitoring results are presented in Table A-3 (for biosparging wells) and Table A-4 (for bioventing wells)
- Previous system well piping monitoring results are presented in Table A-5 (for piping pressure) and Table A-6 (for piping flow)
- Previous system instrumentation monitoring results are presented in Table A-7
- LNAPL volumes previously recovered from groundwater monitoring/venting well AV-06 are summarized in Table A-8
- DNAPL volumes extracted from site wells (i.e., bioventing well BV-13) are summarized in Table A-9
- Groundwater analytical results are summarized in Table A-10

Operation and maintenance activities associated with the engineered cover and barrier wall were conducted in accordance with the O&M Manual, the PCMP, and the EDR. A copy of the completed Post-Construction Inspection Report forms used to document the condition of the cover and access control systems is included in Appendix B. The engineered cover was observed to be in acceptable condition during the inspection events in 2020.

3.2 NAPL RECOVERY

Approximately 8 gallons of LNAPL was recovered from TWP Area well AV-06 in 1999 and LNAPL has not been recovered from this well since 2001 (Table A-8). The LNAPL recovery system was removed from well AV-06 in March 2003 after 15 quarters ins which LNAPL was not observed in greater than trace amounts. LNAPL was not observed in well AV-06 during 2020, but LNAPL was detected in trace amounts in two temporary groundwater monitoring wells (TMP-04 and TMP-05) in April 2020. LNAPL was not observed in any site groundwater monitoring wells in September 2020.

DNAPL was observed in trace amounts in MFA biosparging well BV-13 during 2020 monitoring events. Approximately 0.38 gallons of DNAPL were recovered from well BV-13 in 2020 using a peristaltic pump (Table A-9). The quantity of DNAPL observed and recovered from well BV-13 has generally decreased since manual recovery was initiated in 2002. DNAPL was also observed in groundwater monitoring well 04-6A during the February, April, May, July, August, September, and October 2020 monitoring events. Approximately 0.18 gallons of DNAPL were recovered from well 04-6A in 2020 (Table A-9). Recovered DNAPL quantities in wells BV-13 and 04-6A were slightly greater than in 2019.

3.3 BIOSPARGING

Biosparging operations were discontinued in 2008 (Tables A-1 and A-2).

3.4 GROUNDWATER ELEVATIONS

Depth to groundwater was measured in 16 monitoring wells on April 2 and September 15, 2020. The wells were monitored within a short time interval (approximately one hour) in accordance with the PMCP groundwater monitoring program. Historic National Oceanographic and Atmospheric Association (NOAA) tidal data for river gauging station 9440422 (Longview) and former PCMP well 18.22 is provided in Appendix F for reference.

Depth-to-water measurements were collected both from the PCMP wells outside the barrier wall as well as from the groundwater monitoring/venting wells located both inside and outside the barrier wall. Depth-to-water measurements were converted to groundwater elevations in feet above the North American Vertical Datum of 1988 (ft NAVD 88). Groundwater elevations from these monitoring events are summarized in Table 3-1 and Table 3-2.

Inferred potentiometric contours for the April and September 2020 sampling events are shown on Figure 3-1 and Figure 3-2, respectively. Groundwater elevations for wells inside the barrier wall were not considered in constructing potentiometric contour maps because those wells are isolated from regional groundwater flow by the barrier wall. This is demonstrated by the distinct groundwater elevations calculated for the four wells (AV-01, AV-02, AV-06, and AV-08) monitored within the barrier wall, as further discussed below. Water levels for wells screened in Aquifer A (shallow aquifer) were considered separately from wells screened in Aquifer B (deep aquifer). The difference in groundwater elevation calculated at well pair 04-6A and 97-6B was used to evaluate the vertical gradient between the shallow and deep aquifers and a slight downward vertical gradient (0.23 ft) was evident during the April monitoring event, and a negligible vertical gradient (0.01 ft) was evident during the September 2020 monitoring event (Tables 3-1 and 3-2).

The MFA biosparging system was not operational during 2020. Based on the groundwater elevations measured on April 2, 2020 and September 15, 2020, groundwater flow direction was generally northerly (Figure 3-1 and Figure 3-2). The groundwater elevations inside the barrier wall were generally similar to each other (with the exception of an assumed anomalous interior measurement at well AV-01 that differed by approximately 3 feet in April 2020) while elevations outside the barrier wall were distinctly higher with a measurable gradient indicating that groundwater within the barrier wall does not appear to be in hydraulic connection with shallow groundwater outside the barrier wall.

3.5 DATA QUALITY ASSURANCE/QUALITY CONTROL

Groundwater samples were analyzed by ALS for COCs listed in Table 1-1 by methods identified in Section 2.3.

The chain-of-custody forms, laboratory analytical results, quality assurance/quality control (QA/QC) reports, and case narratives supplied by ALS for each sample group submitted for the April and September 2020 sampling events are presented in Appendix D. Summaries of quality assurance reviews of the laboratory data conducted by AECOM are provided in Appendix E.

The method reporting limits (MRLs) met the project needs for all analytes. Based on the QA/QC reviews, all analytical data were judged acceptable for project uses.

3.6 ANALYTICAL RESULTS

Groundwater analytical results for MFA and TWP wells are summarized in Appendix A, Table A-10. Analytes that were detected at concentrations exceeding the MTCA Method C cleanup levels (interior TWP Area wells) and MTCA Method B cleanup levels (PCMP wells and MFA wells) are highlighted by bold type. Laboratory analytical data reports are provided in Appendix D.

TPH concentrations have historically generally remained below cleanup levels across the site with the exception of TWP Area wells located within the barrier wall containment system (AV-01, AV-02, AV-06, and AV-08), and two wells that are located very near a former lineament observed on historical aerial photographs that has been interpreted to be a ditch that formerly conveyed liquids from the TWP Area (MFA well AV-10 and PCMP well 04-6A). TPH concentrations exceeded cleanup levels in these six wells and also at MFA well locations AV-13 and 99-EA3A (September only). TPH concentrations were not detected at MFA well locations AV-09, AV-11, AV-12, and 97-6B during 2020.

Carcinogenic PAH (cPAH) concentrations exceeded the MTCA Method C cleanup level (TTEC concentration of 0.12 ug/L) at two of the four TWP Area well locations (AV-02 and AV-06) within the barrier wall containment system in 2020. Samples collected from the three wells located near the former lineament (MFA well AV-10 and PCMP wells 04-6A and 97-6B[April only]) and MFA well AV-09 contained cPAH concentrations that exceeded the MTCA Method B cleanup level (TTEC concentration of 0.012 ug/L) in 2020. Samples collected from wells AV-10 and 04-6A located near the former lineament also contained concentrations of dibenzofuran that exceeded cleanup levels during 2020. PCMP well 04-6A also contained concentrations of naphthalene and 2-methlynaphthalene that exceeded cleanup levels in 2020.

PCP was not detected in any samples collected from MFA wells in 2020. Samples collected from wells AV-01, AV-08, AV-11, AV-12, AV-13, and 99-EA3A did not contain PAH concentrations exceeding applicable cleanup levels during 2020 monitoring events. During prior sampling events, cPAH concentrations that exceeded cleanup levels in unfiltered samples were not detected above cleanup levels when groundwater samples were filtered. This suggests that cPAH concentrations are associated with particulates in these wells rather than being dissolved-phase concentrations within groundwater.

Table 3-1 Groundwater Elevations (April 2, 2020 - Systems Off)

Well ID	Northing[1]	Easting[1]	MP Elev. (ft)[2,5]	Depth to Water (ft)[3]	Water Table Elev. (ft)[2]	Time of Measurement
97-1.A	292150.83	1018918.05	17.15	9.40	7.75	4/2/2020 11:50
97-3.A[4]	291633.12	1018963.56	22.55	14.67	7.88	4/2/2020 11:45
97-5.A	291913.44	1018615.63	19.09	11.34	7.75	4/2/2020 12:08
04-6.A	292071.51	1018734.18	16.62	8.87	7.75	4/2/2020 12:15
97-6.B	292079.96	1018740.51	16.15	8.63	7.52	4/2/2020 12:18
LL 01.15[4]	291385.99	1018969.91	24.88	16.93	7.95	4/2/2020 11:36
AV-01	292043.10	1018777.81	20.68	10.23	10.45	4/2/2020 11:53
AV-02	291881.92	1018793.36	25.58	18.13	7.45	4/2/2020 11:58
AV-08	291892.84	1018698.22	21.42	14.01	7.41	4/2/2020 11:56
AV-09	292036.04	1018661.54	18.75	11.05	7.70	4/2/2020 12:13
AV-10	292294.16	1018657.58	16.74	8.94	7.80	4/2/2020 12:04
AV-11	292318.29	1018496.60	15.88	8.14	7.74	4/2/2020 12:01
AV-12	292440.83	1018567.45	17.45	9.69	7.76	4/2/2020 11:58
AV-13	292585.32	1018492.86	17.42	9.79	7.63	4/2/2020 11:47
99EA-3A	292537.92	1018649.97	17.93	10.31	7.62	4/2/2020 11:43
AV-06	291824.65	1018839.96	25.47	18.11	7.36	4/2/2020 12:01

Notes:

[1] Relative to State Planar Coordinate System

[2] Monitoring point (MP) and water table elevations in feet (NAVD 1988).

[3] Depth to water expressed in feet below MP.

[4] Well completions reconfigured during site grading in 2009.

[5] Wells were resurveyed on October 15, 2014.

Table 3-2 Groundwater Elevations (September 15, 2020 - Systems Off)

Well ID	Northing[1]	Easting[1]	MP Elev. (ft)[2,5]	Depth to Water (ft)[3]	Water Table Elev. (ft)[2]	Time of Measurement
97-1.A	292150.83	1018918.05	17.15	10.61	6.54	9/15/2020 16:24
97-3.A[4]	291633.12	1018963.56	22.55	14.68	7.87	9/15/2020 16:19
97-5.A	291913.44	1018615.63	19.09	12.26	6.83	9/15/2020 16:44
04-6.A	292071.51	1018734.18	16.62	9.92	6.70	9/15/2020 16:50
97-6.B	292079.96	1018740.51	16.15	9.46	6.69	9/15/2020 16:52
LL 01.15[4]	291385.99	1018969.91	24.88	17.71	7.17	9/15/2020 16:11
AV-01	292043.10	1018777.81	20.68	14.12	6.56	9/15/2020 16:28
AV-02	291881.92	1018793.36	25.58	19.07	6.51	9/15/2020 16:34
AV-08	291892.84	1018698.22	21.42	14.93	6.49	9/15/2020 16:31
AV-09	292036.04	1018661.54	18.75	11.99	6.76	9/15/2020 16:47
AV-10	292294.16	1018657.58	16.74	10.09	6.65	9/15/2020 16:54
AV-11	292318.29	1018496.60	15.88	9.17	6.71	9/15/2020 16:45
AV-12	292440.83	1018567.45	17.45	10.84	6.61	9/15/2020 16:42
AV-13	292585.32	1018492.86	17.42	10.95	6.47	9/15/2020 16:31
99EA-3A	292537.92	1018649.97	17.93	11.48	6.45	9/15/2020 16:24
AV-06	291824.65	1018839.96	25.47	19.10	6.37	9/15/2020 16:37

Notes:

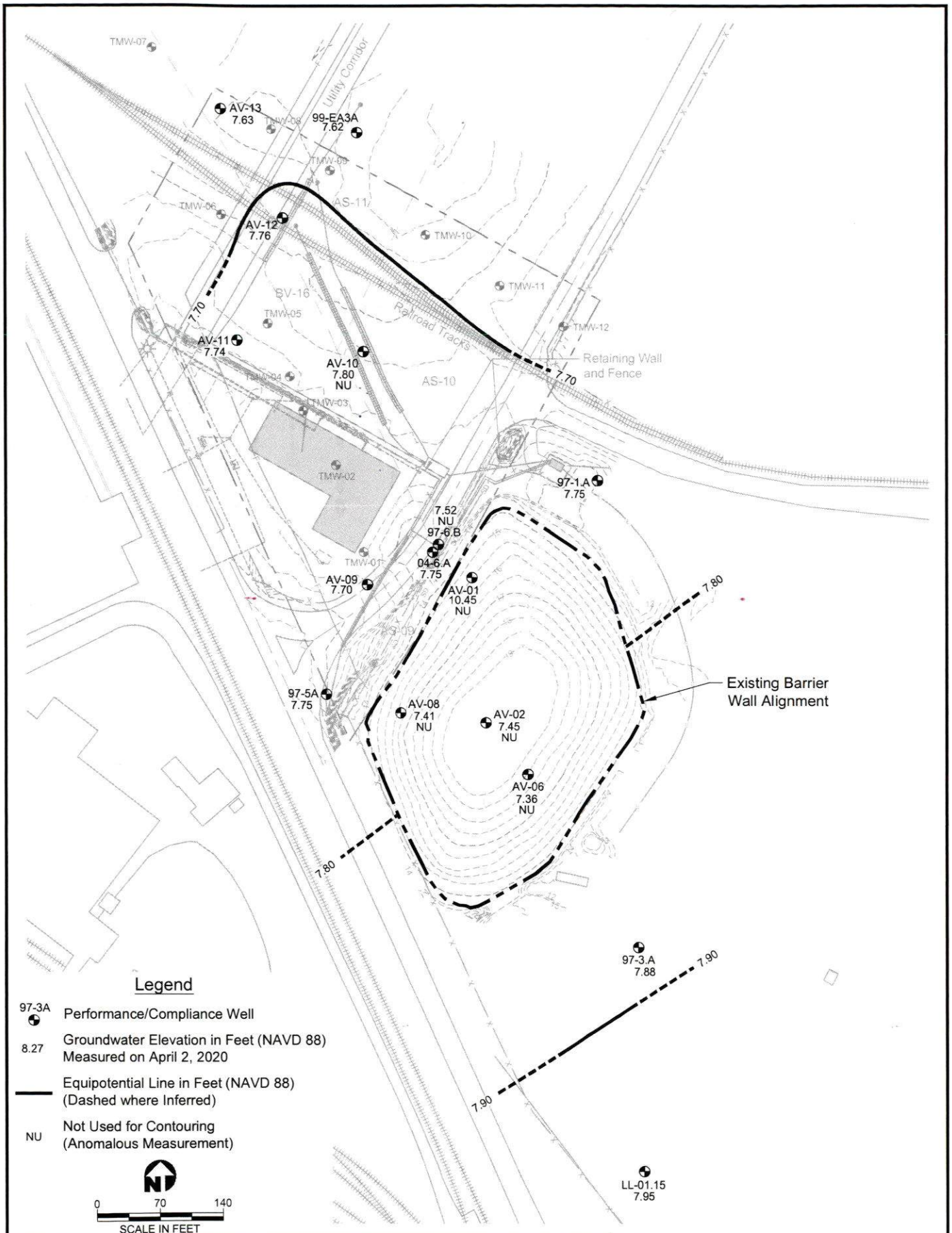
[1] Relative to State Planar Coordinate System

[2] Monitoring point (MP) and water table elevations in feet (NAVD 1988).

[3] Depth to water expressed in feet below MP.

[4] Well completions reconfigured during site grading in 2009.

[5] Wells were resurveyed on October 15, 2014.



International Paper Longview, WA	Project No. 60582179	Designed by: S. Holmes Checked by: D. Raubvogel Drawn by: M. Gagnon	Potentiometric Contour Map - Aquifer A April 2, 2020 - Systems Off	Figure 3-1
AECOM				

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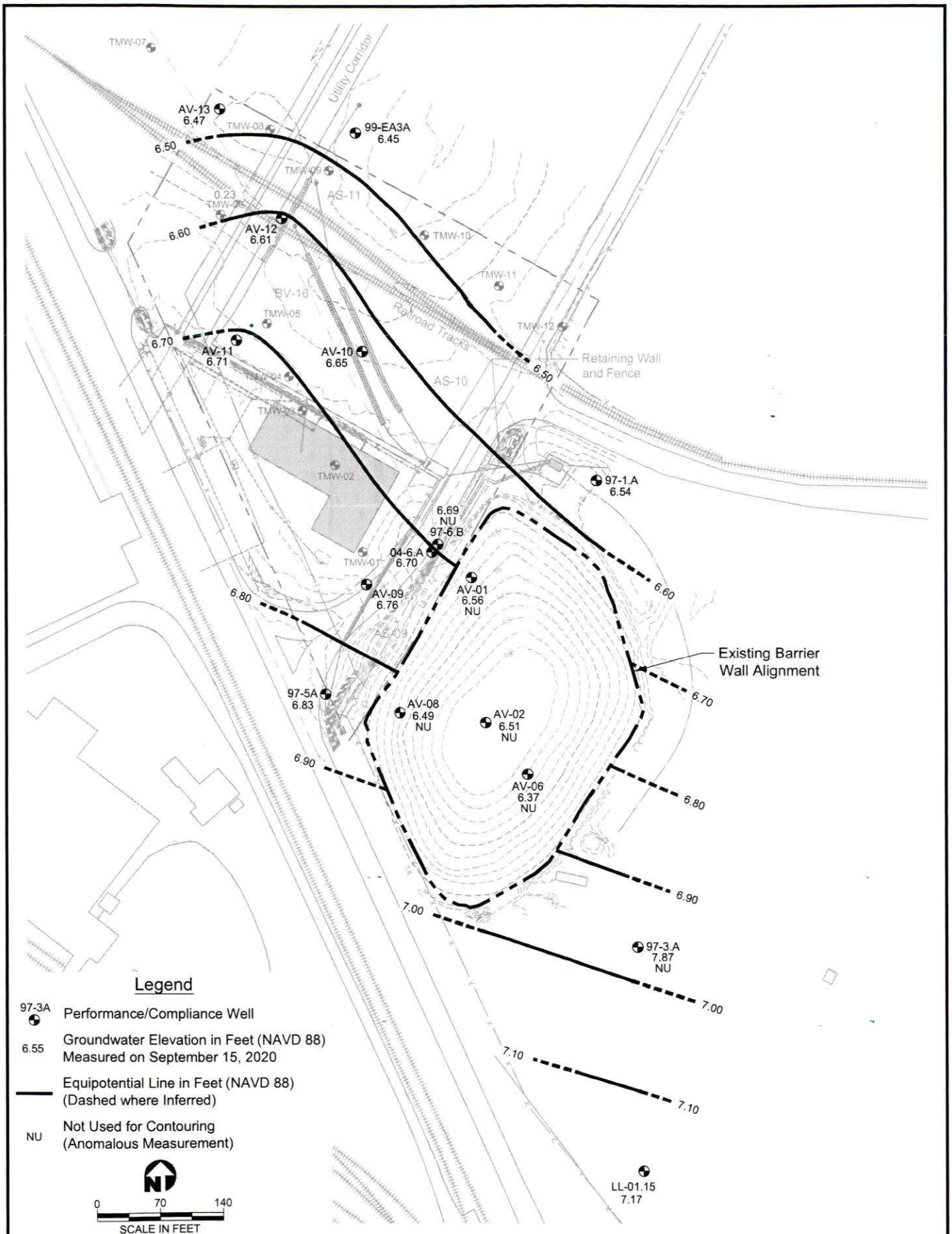

International Paper Longview, WA	Project No. 60582179	Designed by: S. Holmes Checked by: D. Raubvogel Drawn by: M. Gagnon	Potentiometric Contour Map - Aquifer A September 15, 2020 - Systems Off	Figure 3-2
AECOM				

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4.1 TWP AREA

Annual groundwater monitoring was conducted in the TWP Area in 2020 and no significant changes or trends were observed. Continued annual monitoring is recommended during 2021.

4.2 MAINTENANCE FACILITY AREA

Groundwater monitoring conducted in the MFA in 2020 did not indicate any particular changes or trends relative to historical results and continued semi-annual groundwater monitoring is recommended during 2021.

A slightly greater quantity of DNAPL was recovered from bioventing well BV-13 and PCMP well 04-6A during 2020. Continued monthly gauging and removal of DNAPL from wells BV-13 and 04-6A is recommended during 2021.

4.3 PCMP PROGRAM

Based upon the information presented in the fifth, tenth, fifteenth, and twentieth annual groundwater PCMP reports (URS, 2003b, 2009, 2014, and AECOM, 2019), International Paper and Ecology determined that sampling of PCMP wells would be conducted on a semi-annual basis at shallow well 97-6A (replaced by 04-6A) and deeper well 97-6B, and once every five years at shallow wells 97-1A, 97-3A, 97-5A, and LL-01.15. A statistical evaluation of the data collected from these wells is also performed every five years. The sampling results for these wells from the previous five-year sampling event conducted in 2018 passed the significant statistical tests performed.

Results from sampling in PCMP well 04-6A during 2020 indicated that the concentrations of PAHs continue to exceed cleanup goals in that well. Samples from PCMP well 97-6B contained concentrations of cPAHs exceeding applicable MTCA Method B cleanup levels in 2020. Continued semi-annual sampling of PCMP wells 04-6A and 97-6B is recommended during 2021. All six PCMP wells will be sampled again in September 2023 in accordance with the previously determined five-year frequency. No other PCMP monitoring program changes are recommended.

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Appendix A
Operation and Maintenance Tables

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-01							**AV-02**						
10/21/1998	14.3	ND	15.6	< -100	7.1	0.4	10/21/1998	19.22	ND	15.2	-45	6.47	0.29
10/22/1998	13.82	ND	NM	NM	NM	NM	10/22/1998	18.73	ND	NM	NM	NM	NM
10/29/1998	14.25	ND	15.7	< -100	6.93	2	10/29/1998	19.22	ND	16.2	-0.3	6.43	5.82
12/2/1998	10.25	ND	15.5	< -100	6.39	0.75	12/2/1998	14.83	ND	15.5	-20	6.43	1.06
12/16/1998	NM	NM	NM	NM	NM	0.27	12/16/1998	NM	NM	NM	NM	NM	0.12
1/22/1999	8.51	ND	15.5	NM	NM	11.28	1/22/1999	13.76	ND	15.4	NM	NM	0.14
3/2/99[a]	8.21	ND	14.6	-7	6.58	3.25	3/2/99[a]	13.32	ND	15.2	-33	6.51	0.3
5/18/1999	11.25	ND	13.9	-21	6.31	0.63	5/18/1999	16.23	ND	15.4	10	6.37	0.64
5/19/1999	NM	NM	13.8	NM	NM	9.62	5/19/1999	NM	NM	15.6	NM	NM	2.84
7/22/1999	NM	NM	14.4	NM	NM	10.79	7/22/1999	NM	NM	16.8	NM	NM	1.53
7/22/1999	NM	NM	14.4	NM	NM	10.19	7/22/1999	NM	NM	16.8	NM	NM	1.55
8/3/1999	NM	NM	14.5	NM	NM	11.30	8/3/1999	NM	NM	16.6	NM	NM	1.20
9/27/1999	13.98	ND	15.0	11	6.47	9.87	9/27/1999	18.93	ND	17.9	17	6.65	8.66
12/1/1999	11.53	ND	15.5	23	6.34	10.87	12/1/1999	16.38	ND	18.4	18	6.32	4.90
1/18/2000	11.58	ND	14.9	37	6.49	9.83	1/18/2000	14.56	ND	18.7	34	6.33	2.44
4/24/2000	11.00	ND	13.6	71.9	NM	3.70	4/24/2000	15.95	ND	17.9	20	NM	2.04
9/13/2000	14.30	ND	14.3	-1.1	7.45	1.16	9/13/2000	19.29	ND	18.1	0.4	7.24	4.75
12/20/2000	13.87	ND	16.7	-1.1	7.02	5.70	12/20/2000	18.62	ND	18.1	NM	7.44	5.80
4/5/2001	14.12	ND	13.5	83.1	7.68	1.73	4/5/2001	18.99	ND	17.7	NM	7.6	1.43
8/20/2001	14.75	ND	13.5	<-100	7.23	2.61	8/20/2001	19.75	ND	17	<-100	6.86	1.59
2/6/2002	12.12	ND	13.4	NA	7.51	1.85	2/6/2002	17.04	ND	15.7	NA	7.14	2.20
9/10/2002	14.10	ND	13.87	NM	6.36	1.06	9/10/2002	19.10	ND	16.76	NM	6.35	3.21
12/2/2002	14.72	ND	13.7	28.7	6.46	1.80	12/2/2002	18.9	ND	15.02	-12	6.45	1.64
3/5/2003	12.99	ND	13.53	-106	6.28	0.00	3/5/2003	17.88	ND	15.30	-70	6.54	0.00
6/12/2003	12.03	ND	13.3	94	6.80	0.00	6/12/2003	17.18	ND	14.8	26	6.48	0.00
9/10/2003	14.47	ND	13.9	-80	7.77	0.00	9/10/2003	19.35	ND	15.3	-64	9.56	0.00
12/11/2003	13.02	ND	12.9	149	6.15	7.73	12/11/2003	17.5	ND	13.9	-14	6.46	3.54
9/8/2004	14.25	ND	14.5	-75	6.55	4.29	9/8/2004	19.14	ND	15.2	-67	6.57	6.98
9/21/2005	14.32	ND	13.1	-60	8.14	9.74	9/21/2005	19.35	ND	14.1	-50	5.96	11.48
3/22/2006	12.60	ND	12.9	84.1	6.46	3.12	3/22/2006	17.58	ND	13.27	103	6.49	7.58
9/27/2006	14.47	ND	14.6	-76	8.23	9.10	9/27/2006	19.4	ND	14.98	-80	8.2	8.05
3/7/2007	12.50	ND	13.40	-93	6.55	6.27	3/7/2007	17.38	ND	13.68	-85	6.49	7.36
6/8/2007	12.91	ND	13.6	127	6.09	0.00	6/7/2007	17.92	NM	NM	NM	NM	NM
9/19/2007	14.89	ND	13.8	-108	6.19	0.16	9/20/2007	19.70	ND	13.3	-81	5.85	0.28
12/18/2007	12.65	NM	NM	NM	NM	NM	12/18/2007	17.59	NM	NM	NM	NM	NM
3/26/2008	12.65	NM	NM	NM	NM	NM	3/26/2008	17.74	NM	NM	NM	NM	NM
9/25/2008	14.50	ND	13.47	4	6.33	0	9/23/2008	19.44	ND	13.62	-89	6.39	1.29
9/22/2009	14.54	ND	17.22	154	5.81	0.64	9/22/2009	19.49	Sheen	16.45	-14	5.99	0.00
9/9/2010	14.65	ND	13.5	-88	5.00	1.71	9/9/2010	19.60	ND	12.9	-109	4.98	1.89
9/21/2011	14.13	ND	11.23	-154	7.15	0.00	9/21/2011	19.03	ND	12.19	-161	7.07	0.00
9/20/2012	13.85	Sheen	13.80	-75	6.69	0.00	9/20/2012	18.72	Sheen	13.0	-79	6.48	7.08
9/17/2013	14.14	ND	19.69	-22	5.84	4.07	9/17/2013	19.05	ND	13.46	-34	5.73	0.74
9/29/2014	13.84	ND	14.61	-93	6.40	0.00	9/29/2014	18.79	ND	15.00	-60	6.38	0.00
9/14/2015	14.18	ND	12.67	-134	6.14	0.00	9/14/2015	19.21	ND	16.94	-110	6.26	0.00
9/15/2016	14.88	ND	13.56	-17	5.59	0.37	9/15/2016	19.63	ND	17.14	-116	6.86	2.15
9/27/2017	14.18	ND	19.10	-103	6.37	0.00	9/27/2017	19.04	ND	16.63	-112	6.40	0.00
9/13/2018	13.90	ND	15.47	-64	7.59	0.00	9/13/2018	18.86	ND	13.64	-51	8.29	0.00
9/24/2019	14.54	ND	25.76	-93	6.65	0.00	9/24/2019	19.37	ND	17.33	-74	6.60	0.00
9/14/2020	14.21	ND	15.17	-96	6.42	2.07	9/14/2020	19.22	ND	15.36	-71	6.27	0.00
TD:	19.46						TD:	23.13					

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-03							**AV-04**						
10/21/1998	18.4	ND	14.6	-40	6.46	0.41	10/21/1998	16.3	ND	17.7	< -100	6.74	0.1
10/22/1998	17.98	ND	NM	NM	NM	NM	10/22/1998	15.8	ND	NM	NM	NM	NM
10/29/1998	18.49	ND	15	6.2	6.86	2.45	10/29/1998	16.3	ND	18.3	-66.9	6.78	0.74
12/2/1998	14.19	ND	14.8	10	6.52	3.57	12/2/1998	12.19	ND	16.1	-3.2	6.47	8.63
12/16/1998	NM	NM	NM	NM	NM	3.5	12/16/1998	NM	NM	NM	NM	NM	9.3
1/22/1999	12.94	ND	14.1	NM	NM	4.64	1/22/1999	10.72	ND	16.7	NM	NM	0.11
3/2/99[a]	12.42	ND	13.9	21	6.74	3.18	3/2/99[a]	10.2	ND	15.9	-14	6.61	0.25
5/18/1999	15.38	ND	13.9	35	6.65	1.20	5/18/1999	13.27	ND	15.1	-9	6.39	9.63
5/19/1999	NM	NM	14	NM	NM	1.72	5/19/1999	NM	NM	15.2	NM	NM	3.42
7/22/1999	NM	NM	14.9	NM	NM	3.27	7/22/1999	NM	NM	15.1	NM	NM	1.08
7/22/1999	NM	NM	14.9	NM	NM	3.46	7/22/1999	NM	NM	15.0	NM	NM	1.16
8/3/1999	NM	NM	14.5	NM	NM	2.30	8/3/1999	NM	NM	15.2	NM	NM	6.70
9/27/1999	18.16	ND	15.4	29	6.81	4.74	9/27/1999	15.93	ND	15.6	-27	6.83	0.61
12/1/1999	15.65	ND	15.2	5	6.37	6.60	12/1/1999	12.66	ND	15.5	1	6.41	10.45
1/18/2000	14.75	ND	14.8	-18	6.11	2.38	1/18/2000	12.00	ND	13.4	-6	7.15	8.94
4/24/2000	15.15	ND	14.9	98	NM	1.19	4/24/2000	12.75	ND	13.6	142	NM	10.61
9/13/2000	18.47	ND	15.6	1.1	7.98	5.80	9/13/2000	16.29	ND	15.8	11.2	7.98	6.45
12/20/2000	17.94	ND	15.9	NM	8.57	5.52	12/20/2000	15.67	ND	15.8	-100.5	8.68	4.75
4/5/2001	18.19	ND	15.2	195	7.51	2.26	4/5/2001	15.99	ND	14.6	NM	8.17	6.47
8/20/2001	18.85	ND	15.5	<-100	8.51	3.03	8/20/2001	16.66	ND	14.8	NM	7.72	9.56
2/6/2002	16.24	ND	14.0	-101.5	6.82	6.90	2/6/2002	14.04	ND	13.4	NA	6.93	1.85
9/10/2002	18.40	ND	15.2	NM	5.68	1.31	9/10/2002	16.15	ND	14.28	NM	6.66	1.18
12/2/2002	18.15	ND	14.5	138.9	5.81	6.20	12/2/2002	16.04	ND	14.0	16.3	6.7	4.79
3/5/2003	17.13	ND	14.34	178	6.03	0.00	3/6/2003	14.89	ND	13.45	-43	7.16	0.12
6/12/2003	16.45	ND	14.2	176	6.58	0.00	6/12/2003	15.15	ND	13.4	-95	6.56	0.00
9/10/2003	18.54	ND	14.4	149	11.09	0.00	9/10/2003	16.3	ND	14.84	-46	7.98	0.31
12/11/2003	17.02	ND	13.1	85	6.43	2.65	12/11/2003	14.85	ND	12.84	-11	6.66	5.47
9/8/2004	18.43	ND	14.6	101	6.66	6.27	9/8/2004	16.07	ND	15.6	-43	6.7	3.50
9/21/2005	18.67	ND	13.9	87	5.52	12.38	9/21/2005	16.35	ND	14.95	-56	6.25	10.27
3/22/2006	18.83	ND	13.0	69	6.32	6.14	3/22/2006	14.64	ND	12.51	30.6	6.5	5.01
9/27/2006	NM	NM	NM	NM	NM	NM	9/27/2006	NM	NM	NM	NM	NM	NM
WA							WA						
TD:	21.64						TD:	18.48					

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-05							**AV-06**						
10/21/1998	15.6	ND	16	< -100	7.32	0.6	10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	15.15	ND	NM	NM	NM	NM	10/22/1998	18.25	0.8	NM	NM	NM	NM
10/29/1998	15.64	ND	16.3	-57.5	7.13	0.45	10/29/1998	18.46	0.56	NM	NM	NM	NM
12/2/1998	11.12	ND	15.9	-41.5	6.94	0.65	12/2/1998	13.66	0.27	NM	NM	NM	NM
12/16/1998	NM	NM	NM	NM	NM	2.5	12/16/1998	NM	NM	NM	NM	NM	NM
1/22/1999	10.02	ND	13.6	NM	NM	3.49	1/22/1999	12.77	0.36	NM	NM	NM	NM
3/2/99[a]	9.51	ND	12.6	17	6.81	4.39	3/2/99[a]	12.29	0.38	NM	NM	NM	NM
5/18/1999	12.44	ND	13.5	28	6.57	0.51	5/18/1999	NM	NM	NM	NM	NM	NM
5/19/1999	NM	NM	13.5	NM	NM	0.81	5/19/1999	NM	NM	NM	NM	NM	NM
7/22/1999	NM	NM	14.0	NM	NM	0.77	7/22/1999	NM	NM	NM	NM	NM	NM
7/22/1999	NM	NM	14.0	NM	NM	0.87	7/22/1999	NM	NM	NM	NM	NM	NM
8/3/1999	NM	NM	14.4	NM	NM	1.00	8/3/1999	NM	NM	NM	NM	NM	NM
9/27/1999	15.24	ND	15.2	-5	6.77	0.91	9/27/1999	16.40	0.44	NM	NM	NM	NM
12/1/1999	12.72	ND	14.3	-10	6.44	4.97	12/3/1999	13.39	ND	NM	NM	NM	NM
1/18/2000	11.87	ND	12.5	-10	7.52	2.30	1/18/2000	12.49	ND	NM	NM	NM	NM
4/24/2000	12.26	ND	12.4	23.1	NM	3.01	4/24/2000	12.90	ND	NM	NM	NM	NM
9/13/2000	15.58	ND	15	-1.2	8.89	3.54	9/13/2000	16.40	0.26	NM	NM	NM	NM
12/20/2000	15.05	ND	12.8	NM	8.92	4.15	12/20/2000	15.57	ND	NM	NM	NM	NM
4/5/2001	15.32	ND	12.5	NM	8.36	4.30	4/5/2001	15.90	ND	NM	NM	NM	NM
8/20/2001	15.94	ND	14.7	NM	7.67	3.42	8/20/2001	16.64	0.24	NM	NM	NM	NM
2/6/2002	13.38	ND	13.2	NA	6.50	3.37	2/6/2002	NM	ND	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM	9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	15.29	ND	13.5	138.9	6.79	6.50	12/2/2002	NM	NM	NM	NM	NM	NM
3/6/2003	14.26	ND	13.13	99	7.09	0.23	3/6/2003	14.83	Trace	NM	NM	NM	NM
6/12/2003	14.38	ND	12.9	187	6.09	0.98	6/12/2003	17.50	ND	NM	NM	NM	NM
9/10/2003	15.65	ND	13.9	17	8.32	0.00	9/10/2003	19.21	ND	NM	NM	NM	NM
12/11/2003	14.12	ND	13.0	-17	7.04	2.94	12/11/2003	17.75	ND	13.23	-40	6.64	6.19
9/8/2004	15.52	ND	14.2	99	6.85	10.51	9/8/2004	19.10	ND	15	-49	6.46	3.73
9/21/2005	15.75	ND	13.8	43	5.54	12.31	9/21/2005	19.27	NA	NA	NA	NA	NA
3/22/2006	13.85	ND	12.4	61.1	6.5	5.72	3/22/2006	17.64	ND	13.15	-34.1	6.46	5.50
9/27/2006	NM	NM	NM	NM	NM	NM	9/27/2006	19.29	ND	NA	NA	NA	NA
WA							3/7/2007	17.18	ND	13.19	-89	6.74	7.48
TD:	17.52						6/7/2007	17.72	NM	NM	NM	NM	NM
							9/20/2007	19.46	NM	15.1	-93	6.37	0.33
							12/18/2007	DRY	NM	NM	NM	NM	NM
							3/26/2008	17.81	NM	NM	NM	NM	NM
							9/23/2008	19.15	Trace	NM	NM	NM	NM
							9/23/2009	19.32	ND	17.08	19	6.61	3.75
							9/8/2010	19.63	Trace	15.0	-113	4.99	12.05
							9/21/2011	18.94	ND	10.99	-180	7.37	0.00
							9/20/2012	18.69	Sheen	13.40	-99	6.62	0.00
							9/17/2013	18.82	ND	14.21	-12	5.76	0.59
							9/29/2014	18.76	ND	14.36	-71	6.55	0.00
							9/14/2015	19.04	ND	15.18	-111	6.13	0.00
							9/15/2016	19.64	ND	14.22	-33	5.59	0.53
							9/27/2017	18.99	ND	24.21	26	6.51	0.00
							9/13/2018	18.87	ND	14.04	-89	7.88	0.00
							9/21/2019	19.31	ND	16.77	-75	6.71	0.00
							9/14/2020	19.06	ND	19.29	-83	6.46	0.00
							TD:	14.83 / 16.70					

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-07							**AV-08**						
10/21/1998	18.06	ND	15	< -100	7.1	0.5	10/21/1998	15.1	ND	15	< -100	6.7	0.15
10/22/1998	17.44	ND	NM	NM	NM	NM	10/22/1998	14.44	ND	NM	NM	NM	NM
10/29/1998	18.07	ND	15.4	-89.5	6.3	0.46	10/29/1998	15.24	ND	16.7	-39.5	7.03	4.75
12/2/1998	13.66	ND	15.7	-23.2	6.4	3.05	12/2/1998	11.15	ND	16.9	-61	6.62	0.63
12/16/1998	NM	NM	NM	NM	NM	5.5	12/16/1998	NM	NM	NM	NM	NM	0.75
1/22/1999	12.58	ND	15.6	NM	NM	1.99	1/22/1999	9.9	ND	14.5	NM	NM	0.15
3/2/99[a]	12.06	ND	15.2	27	6.26	1.53	3/2/99[a]	9.07	ND	12.8	-81	6.58	0.34
5/18/1999	14.98	ND	14.9	43	6.32	8.19	5/18/1999	12.09	ND	13.1	6	6.41	7.95
5/19/1999	NM	NM	14.9	NM	NM	3.58	5/19/1999	NM	NM	13.9	NM	NM	3.39
7/22/1999	NM	NM	15.7	NM	NM	1.04	7/22/1999	NM	NM	14.4	NM	NM	0.96
7/22/1999	NM	NM	15.7	NM	NM	1.28	7/22/1999	NM	NM	14.1	NM	NM	0.88
8/3/1999	NM	NM	15.8	NM	NM	0.3	8/3/1999	NM	NM	14.9	NM	NM	0.60
9/27/1999	17.73	ND	16.7	13	6.53	6.91	9/27/1999	14.78	ND	16	-16	6.94	3.53
12/1/1999	15.16	ND	16.6	57	6.69	4.90	12/1/1999	12.28	ND	14.6	23	7.15	7.92
1/18/2000	14.34	ND	15.7	26	7.57	6.09	1/18/2000	11.50	ND	12.9	5	5.78	1.77
4/24/2000	14.8	ND	15	147	NM	9.54	4/24/2000	11.91	ND	12.6	169	NM	2.06
9/13/2000	18.0	ND	16	-0.3	7.10	1.91	9/13/2000	15.12	ND	15.5	2	5.14	6.45
12/20/2000	17.52	ND	16	-100	7.36	5.55	12/20/2000	14.58	ND	13.1	-100	7.12	4.62
4/5/2001	17.79	ND	15.6	NM	8.72	0.45	4/5/2001	14.89	ND	12.5	NM	6.58	2.32
8/20/2001	18.41	ND	15.2	<-100	8.49	4.09	8/20/2001	15.52	ND	13.5	<-100	6.21	5.79
2/6/2002	15.80	ND	15.2	NA	6.77	1.87	2/6/2002	12.90	ND	13.4	-44.6	6.42	3.40
9/10/2002	17.90	NM	15.07	NM	7.22	2.57	9/10/2002	15.10	ND	13.91	NM	5.92	1.15
12/2/2002	17.68	ND	14.6	22.4	7.32	1.75	12/2/2002	14.74	ND	13.8	105.0	6.10	10.60
3/6/2003	16.69	ND	14.7	-74	6.87	0.00	3/6/2003	12.76	ND	13.52	131	5.98	0.00
6/12/2003	15.98	ND	14.2	125	6.83	0.70	6/12/2003	13.03	ND	13.1	59	6.59	1.93
9/10/2003	18.13	ND	15.0	-85	9.71	0.00	9/10/2003	15.12	ND	13.97	74	8.67	0.00
12/11/2003	16.60	ND	13.8	14	6.88	3.01	12/11/2003	13.74	ND	13.47	44	6.26	3.36
9/8/2004	17.92	ND	15.1	-72	6.99	4.33	9/8/2004	15	ND	14.5	56	6.13	4.21
9/21/2005	18.07	ND	13.3	-18	8.36	10.04	9/21/2005	15.23	ND	14.68	18	6.92	10.94
3/22/2006	15.30	ND	13.4	91	6.7	4.10	3/22/2006	13.43	ND	12.57	107	6.29	4.63
9/27/2006	NM	NM	NM	NM	NM	NM	9/27/2006	15.25	ND	14.56	-9	7.34	9.24
WA							3/7/2007	13.26	ND	12.57	27	6.11	6.58
TD:	22.1						6/8/2007	13.71	ND	12.8	42	5.63	4.35
							9/19/2007	15.53	ND	13.1	48	5.43	0.20
							12/19/2007	13.50	ND	13.31	52	6.23	1.08
							3/26/2008	13.60	NM	NM	NM	NM	NM
							9/23/2008	15.34	ND	12.54	31	5.82	0.99
							9/22/2009	15.35	Sheen	17.30	117	5.28	0.35
							9/9/2010	15.51	ND	12.7	13	4.86	2.78
							9/21/2011	14.93	ND	11.29	-101	6.83	0.00
							9/20/2012	14.71	Sheen	12.50	-20	6.39	4.84
							9/17/2013	14.65	ND	13.22	3	5.52	0.54
							9/29/2014	14.67	ND	13.54	-24	6.15	0.00
							9/14/2015	15.04	ND	12.74	-74	5.97	0.00
							9/15/2016	15.54	ND	14.21	59	5.12	0.28
							9/27/2017	14.93	ND	19.27	72	6.39	0.00
							9/13/2018	14.71	ND	14.37	-35	8.33	0.00
							9/24/2019	15.17	ND	15.66	-60	6.44	0.00
							9/14/2020	15.09	ND	18.74	-69	6.18	0.00
							TD:	18.92					

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

MAINTENANCE FACILITY AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-09							**AV-10**						
5/3/2002	10.45	ND	14.6	NM	6.13	NA	5/3/2002	7.40	ND	13.8	1	6.11	NA
6/19/02a	10.24	ND	NM	NM	NM	NM	6/19/02a	8.18	ND	NM	NM	NM	NM
6/19/02p	0.00	ND	NM	NM	NM	NM	6/19/02p	5.19	ND	NM	NM	NM	NM
6/20/2002	4.70-8.46	ND	NM	NM	NM	NM	6/20/2002	7.45	ND	NM	NM	NM	NM
9/11/2002	11.30	ND	16.21	NM	6.66	5.42	9/11/2002	11.48	ND	18.28	NM	6.15	1.3
12/2/2002	NM	NM	NM	NM	NM	NM	12/2/2002	11.25	ND	20.22	-49	6.1	1.6
3/6/2003	11.13	ND	16.2	132	5.84	4.28	3/6/2003	9.96	ND	19.98	-45	6.07	0.77
6/12/2003	6+-2	ND	15.8	40	6.36	6-8	6/12/2003	11.24	ND	19.3	-7	6.13	0.00
9/10/2003	12.32	ND	16.3	201	5.11	9.36	9/10/2003	9.6	Sheen	NM	NM	NM	NM
12/11/2003	NM	ND	16.2	210	5.22	NM	12/11/2003	9.5	ND	23.02	-62	6.36	6.70
3/10/2004	11.30	ND	16.26	341	4.84	10.69	3/10/2004	11.60	DNAPL=0.67	20.55	-11	5.81	0.34
9/8/2004	13.60	ND	16.80	137	5.77	8.28	9/8/2004	11.11	Trace	20.9	-47	6.11	3.50
3/15/2005	10.75	ND	15.37	235	5.81	10.20	3/15/2005	11.72	Trace	18.03	-59	6.28	3.53
9/21/2005	13	ND	16.51	172	5.02	11.65	9/21/2005	11.1	Trace	19.65	-13	6.14	9.08
3/22/2006	7.1	ND	15.96	435	4.68	10.20	3/22/2006	10.95	Trace	18.17	14.4	5.96	4.70
9/27/2006	12.7	ND	17.49	208	4.23	7.35	9/27/2006	10.56	Trace	19.91	-61	7.65	8.11
3/8/2007	11.32	ND	15.22	352	4.69	10.81	3/8/2007	10.12	ND	15.43	138	6.29	10.02
6/8/2007	10.92	ND	15.8	403	4.24	2.22	6/7/2007	8.95	NM	NM	NM	NM	NM
9/19/2007	12.50	ND	16.9	372	4.45	9.48	9/19/2007	9.55	ND	20.4	44	5.99	5.36
12/19/2007	9.09	ND	15.61	198	5.43	7.66	12/19/2007	9.37	ND	17.59	-87	6.93	1.50
3/25/2008	10.43	ND	15.47	378	4.24	6.91	3/25/2008	8.82	ND	15.56	66	5.66	4.77
9/23/2008	12.61	ND	17.23	315	4.63	0	9/25/2008	10.60	ND	18.24	-125	6.63	0
3/18/2009	11.41	Trace	15.34	140	4.88	1.14	3/19/2009	8.84	ND	14.44	-10	5.94	0.00
9/23/2009	12.63	ND	18.17	179	4.50	0.02	9/23/2009	10.56	ND	20.30	65	5.68	0.00
3/17/2010	12.50	ND	14.8	216	5.22	0.00	3/17/2010	10.48	ND	16.0	4	5.87	0.00
9/8/2010	13.16	ND	16.1	200	4.46	4.75	9/9/2010	11.05	ND	17.3	-28	4.83	3.56
3/9/2011	9.10	ND	14.1	-15	6.30	2.14	3/8/2011	7.41	ND	14.3	-108	7.14	1.78
9/21/2011	12.45	ND	12.16	49	5.60	0.00	9/20/2011	10.10	ND	13.95	-54	6.30	1.18
3/14/2012	8.94	ND	11.99	167	5.53	1.70	3/14/2012	7.01	ND	11.30	-22	5.63	0.07
9/20/2012	11.66	ND	15.5	80	6.33	NA	9/20/2012	9.98	Sheen	18.1	-38	6.78	17.75
3/13/2013	11.23	ND	15.14	46	6.66	0.58	3/14/2013	9.52	ND	13.48	-33	6.55	0.53
9/17/2013	11.89	ND	17.61	76	5.37	4.14	9/17/2013	9.88	ND	18.36	34	5.27	0.93
3/6/2014	8.94	ND	14.32	14.7	6.13	0.72	3/7/2014	6.28	ND	5.40	-87	6.16	0.00
9/29/2014	11.86	ND	16.24	-36	6.25	0.00	9/30/2014	9.87	ND	18.95	-35	6.08	0.00
3/3/2015	10.76	ND	15.57	-78	6.12	0.00	3/4/2015	8.46	ND	12.03	-91	6.09	0.00
9/15/2015	12.48	ND	15.69	-135	6.32	0.00	9/15/2015	10.19	ND	15.43	-102	7.00	0.00
3/24/2016	8.87	ND	14.18	28	6.10	0.00	3/23/2016	7.09	ND	13.43	-22	6.06	0.41
9/15/2016	12.86	ND	16.47	-142	6.94	4.54	9/15/2016	10.82	ND	17.90	-118	6.62	4.34
3/22/2017	5.77	ND	13.65	13	7.12	1.05	3/22/2017	4.06	ND	13.90	2	6.78	0.00
9/27/2017	12.31	ND	16.64	-115	6.35	0.00	9/28/2017	10.51	ND	23.80	42	6.47	0.00
3/21/2018	10.05	ND	15.00	115	6.63	0.02	3/22/2018	7.60	ND	11.67	-60	5.04	5.58
9/12/2018	12.42	ND	16.69	-95	8.33	0.00	9/13/2018	9.90	ND	16.74	-74	6.57	0.01
3/20/2019	11.49	ND	17.63	-60	6.49	0.73	3/20/2019	9.72	ND	15.45	-97	6.36	0.25
9/25/2019	12.85	ND	16.09	-107	6.67	0.00	9/24/2019	10.42	ND	20.58	-62	6.47	0.17
4/1/2020	10.90	ND	14.5	-74	6.76	0.00	4/1/2020	8.85	Sheen	14.12	-96	6.63	0.00
9/14/2020	12.62	ND	16.49	-124	6.36	0.00	9/14/2020	10.29	ND	22.12	-98	6.57	0.00
TD	17.98						TD:	14.90					

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

MAINTENANCE FACILITY AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-11							**AV-12**						
5/3/2002	7.40	ND	13.1	NM	6.27	NA	5/3/2002	8.50	ND	13.1	-101.3	6.15	NA
6/19/02a	7.30	ND	NM	NM	NM	NM	6/19/02a	8.22	ND	NM	NM	NM	NM
6/19/02p	5.70	ND	NM	NM	NM	NM	6/19/02p	6.12	ND	NM	NM	NM	NM
6/20/2002	6.88	ND	NM	NM	NM	NM	6/20/2002	7.86	ND	NM	NM	NM	NM
9/11/2002	9.58	ND	16.61	NM	6.36	2.08	9/11/2002	11.60	ND	17.62	NM	6.17	3.01
12/2/2002	NA	NA	NA	NA	NA	NA	12/2/2002	10.36	ND	17.54	119	5.34	8.76
3/6/2003	8.61	ND	14.84	-38	6.14	0.32	3/6/2003	9.29	ND	15.52	188	4.97	0.28
6/12/2003	7.48	ND	14.9	-34	5.95	0.00	6/12/2003	8.45	ND	15.4	159	4.98	8.43
9/10/2003	9.56	ND	16.74	39	6.38	6.11	9/10/2003	10.63	ND	17.81	231	5.37	10.01
12/11/2003	7.50	ND	16.1	-14	6.25	2.08	12/11/2003	8.08	ND	17.31	181	5.53	10.05
3/10/2004	9.10	ND	14.83	62	6.13	4.90	3/10/2004	10.69	ND	15.44	149	4.79	8.43
9/8/2004	10.39	ND	17.70	12	6.05	1.23	9/8/2004	11.86	ND	18.3	147	5.94	6.87
3/15/2005	10.16	ND	14.57	15	6.14	10.15	3/15/2005	12.04	ND	15.33	239	5.3	9.72
9/21/2005	10.30	ND	16.35	31	5.82	10.32	9/21/2005	12.05	ND	17.22	163	5.28	9.30
3/22/2006	7.68	ND	15.1	142	5.8	7.50	3/22/2006	8.44	ND	15.2	201	5.08	10.80
9/27/2006	9.69	ND	17.52	5	7.01	7.39	9/27/2006	10.61	ND	18.53	113	6.28	8.65
3/8/2007	8.80	ND	14.77	18	6.18	3.10	3/8/2007	10.20	ND	13.99	139	6.61	10.71
6/7/2007	8.38	NM	NM	NM	NM	NM	6/8/2007	9.14	ND	14.9	301	4.53	3.95
9/19/2007	9.55	ND	17.5	36	5.89	1.66	9/19/2007	10.35	ND	17.8	231	5.24	8.98
12/19/2007	7.75	ND	16.57	125	6.23	1.50	12/18/2007	8.41	NM	NM	NM	NM	NM
3/25/2008	8.23	ND	14.48	159	5.37	1.63	3/26/2008	8.70	ND	13.09	258	5.35	10.24
9/23/2008	9.80	ND	16.85	34	6.02	0	9/25/2008	10.72	ND	17.19	183	5.44	0
3/19/2009	8.11	ND	13.97	49	0.00	0.00	3/19/2009	8.96	ND	13.65	86	5.35	0.00
9/23/2009	9.75	ND	19.13	162	5.30	0.00	9/23/2009	10.69	ND	19.99	162	4.93	0.14
3/17/2010	9.69	ND	14.9	30	6.33	0.00	3/17/2010	10.50	ND	13.2	190	5.64	0.00
9/9/2010	9.98	ND	15.1	-13	4.92	3.76	9/9/2010	10.94	ND	17.2	118	4.82	1.80
3/9/2011	6.25	ND	12.6	-74	7.19	4.74	3/8/2011	7.42	ND	13.2	8	5.49	2.25
9/20/2011	9.45	ND	11.51	-86	6.87	0.00	9/20/2011	10.18	ND	13.68	17	6.49	0.00
3/14/2012	6.40	ND	10.08	11	6.13	1.16	3/14/2012	7.12	ND	11.25	112	5.76	0.64
9/20/2012	9.32	ND	16.8	-73	6.85	0.00	9/19/2012	10.16	ND	17.4	10	6.71	0.00
3/14/2013	8.57	ND	13.55	-75	6.58	0.47	3/14/2013	9.32	ND	13.71	43	6.46	0.80
9/17/2013	9.30	ND	17.50	NM	5.18	-0.21	9/18/2013	10.71	ND	16.6	NM	4.88	1.11
3/7/2014	5.31	ND	4.60	-1	6.19	0.00	3/6/2014	7.06	ND	5.61	-154	5.86	0.00
9/30/2014	9.02	ND	17.90	-68	6.53	0.00	9/30/2014	10.60	ND	18.33	38	6.12	0.00
3/4/2015	7.83	ND	11.38	24	6.80	0.00	3/3/2015	9.32	ND	14.40	5	6.42	0.00
9/15/2015	9.52	ND	16.56	-137	7.54	0.00	9/15/2015	11.11	ND	17.95	-58	7.05	0.00
3/24/2016	5.91	ND	11.88	-60	6.59	0.61	3/23/2016	7.72	ND	12.73	15	5.98	0.55
9/14/2016	9.77	ND	18.48	-98	6.27	0.26	9/14/2016	11.59	ND	19.16	32	5.89	0.31
3/22/2017	3.17	ND	14.05	-92	6.57	0.00	3/23/2017	4.92	ND	13.73	134	6.72	0.00
9/28/2017	9.35	ND	18.05	3	6.79	0.00	9/28/2017	10.88	ND	18.16	105	6.32	0.00
3/22/2018	6.71	ND	12.73	-66	5.55	1.53	3/21/2018	8.60	ND	14.08	-44	5.31	1.81
9/13/2018	9.23	ND	17.27	-125	6.90	0.00	9/12/2018	10.80	ND	20.58	-26	6.45	0.00
3/20/2019	8.52	ND	13.46	-127	6.80	0.42	3/20/2019	10.22	ND	15.4	-70	6.25	0.31
9/25/2019	9.85	ND	16.67	-106	6.83	0.25	9/24/2019	11.10	ND	19.2	-13	6.22	0.25
4/1/2020	8.02	ND	14.27	-165	6.83	1.36	4/2/2020	9.89	ND	13.28	-37	6.18	0.84
9/14/2020	9.69	ND	18.31	-137	6.60	1.54	9/15/2021	10.99	ND	18.23	-47	6.17	0.00
TD	14.90						TD:	14.50					

Table A-1

BIOSPARGING WELL GROUNDWATER MONITORING DATA SUMMARY

MAINTENANCE FACILITY AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
AV-13							**99-EA3A**						
5/3/2002	9.23	ND	13.4	-1	6.21	NA	5/3/2002	9.80	ND	14.40	-100.9	6.11	7.57
6/19/02a	9.94	ND	NM	NM	NM	NM	9/11/2003	11.61	ND	17.07	-56	6.66	4.28
6/19/02p	8.55	ND	NM	NM	NM	NM	3/10/2004	10.57	ND	17.52	106	6.33	3.29
6/20/2002	8.75	ND	NM	NM	NM	NM	9/8/2004	11.72	ND	18.7	-57	6.34	2.09
9/11/2002	11.20	ND	18.36	NM	6.24	2.26	3/15/2005	11.58	ND	17.07	-74	6.41	9.49
12/2/2002	11.09	ND	15.71	-67	6.38	0.57	9/21/2005	11.71	ND	17.08	-44	5.98	9.74
3/6/2003	9.78	ND	15.6	-111	6.47	0.25	3/22/2006	9.82	ND	17.05	-60.5	6.23	5.75
6/12/2003	9.34	ND	15.6	-65	6.55	0.00	9/27/2006	11.6	ND	18.38	-67	7.86	3.99
9/10/2003	11.08	ND	16.53	-95	6.87	5.30	3/8/2007	10.10	ND	16.16	80	6.32	5.82
12/11/2003	9.52	ND	10.77	-91	8.8	3.14	6/8/2007	10.39	ND	16.8	-64	6.12	0.00
3/10/2004	10.74	ND	15.77	-77	6.32	2.80	9/18/2007	12.05	ND	17.9	-112	6.36	0.11
9/8/2004	11.01	ND	18.9	-64	5.77	1.84	12/19/2007	9.93	ND	14.81	167	6.43	5.96
3/15/2005	10.81	ND	15.79	-111	6.54	10.16	3/25/2008	10.22	ND	16.38	-62	5.95	0.24
9/21/2005	11.04	ND	16.81	-84	6.8	9.34	9/24/2008	11.86	ND	17.12	-76	6.44	0
3/22/2006	9.25	ND	15.2	-48	6.84	6.3	3/19/2009	10.22	ND	14.31	107	6.59	NA
9/27/2006	11.25	ND	18.71	-109	8.24	2.49	9/23/2009	11.83	ND	20.75	-40	6.08	0.05
3/8/2007	9.19	ND	15.11	-119	6.57	2.92	3/16/2010	11.92	ND	15.3	-28	6.56	0.00
6/7/2007	9.83	NM	NM	NM	NM	NM	9/9/2010	12.14	ND	16.3	-82	5.07	1.74
9/18/2007	11.49	ND	18.5	-91	6.24	0.11	3/8/2011	8.50	ND	15.6	-174	7.89	2.30
12/18/2007	9.23	NM	NM	NM	NM	NM	9/20/2011	11.33	ND	13.50	-96	7.15	0.00
3/25/2008	9.63	ND	14.11	-76	5.90	0.21	3/14/2012	8.39	ND	8.69	101	6.38	12.77
9/24/2008	11.27	ND	18.36	-72	6.25	0	9/19/2012	11.31	ND	16.9	-131	7.11	0.00
3/19/2009	9.82	ND	14.00	-113	6.54	NA	3/14/2013	10.41	ND	14.27	-76	6.49	0.64
9/23/2009	11.35	ND	20.31	-4	5.74	0.00	9/17/2013	11.09	ND	19.8	60	5.65	0.39
3/16/2010	11.20	ND	14.9	-88	6.37	0.00	3/7/2014	7.82	ND	15.59	-38.4	5.92	0.60
9/9/2010	11.59	ND	17.6	-89	5.06	2.96	9/30/2014	11.22	ND	17.43	-8	6.19	0.00
3/8/2011	7.96	ND	14.6	-194	8.21	1.86	3/3/2015	9.70	ND	15.25	-43	6.50	0.00
9/20/2011	10.80	ND	14.26	-158	7.28	0.00	9/14/2015	11.65	ND	17.74	-101	7.15	0.00
3/14/2012	8.00	ND	12.26	-121	6.31	0.58	3/23/2016	8.22	ND	13.23	-6	6.32	0.00
9/20/2012	10.74	Sheen	17.8	-134	6.86	4.71	9/14/2016	12.10	ND	19.80	-114	6.40	4.33
3/14/2013	9.88	ND	13.15	-140	6.49	0.42	3/23/2017	5.62	ND	14.02	-27	6.36	0.00
9/17/2013	10.78	ND	18.10	NM	5.64	0.10	9/28/2017	11.42	ND	16.86	-66	6.03	0.00
3/6/2014	7.62	ND	6.71	-90	6.42	0.00	3/21/2018	9.08	ND	13.96	-50	5.50	1.79
9/30/2014	10.66	ND	17.54	-87	6.10	0.00	9/12/2018	11.30	ND	17.35	-73	6.49	0.00
3/3/2015	9.02	ND	15.15	-104	6.70	0.00	3/20/2019	10.61	ND	18.76	-76	6.44	1.08
9/14/2015	11.13	ND	16.82	-138	7.28	0.00	9/25/2019	11.68	ND	15.7	32	6.3	0.66
3/23/2016	7.64	ND	13.24	-52	6.34	0.00	4/1/2020	10.21	ND	14.7	-70	6.39	4.00
9/14/2016	11.65	ND	19.84	-193	6.91	0.73	9/15/2021	11.51	ND	15.98	-91	6.23	1.35
3/22/2017	5.16	ND	15.22	-33	6.31	0.00	TD:	20					
9/28/2017	10.85	ND	17.75	-110	6.37	0.00							
3/21/2018	8.65	ND	14.70	67	6.65	0.03							
9/12/2018	10.80	ND	17.07	-83	8.94	0.00							
3/20/2019	10.04	ND	14.76	-122	6.66	1.25							
9/24/2019	11.02	ND	17.04	58.4	6.68	0.87							
4/2/2020	9.86	ND	13.84	-90	6.64	0.00							
9/15/2021	10.97	Sheen	18.40	-85	6.25	0.00							
TD:	14.98												

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MAINTENANCE FACILITY AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
04-6A							**97-6B**						
9/8/2004	10.33	ND	16.2	-60	6.24	0.75	9/11/2003	9.30	ND	14.48	-61	7.10	7.46
9/21/2005	10.72	ND	14.75	-95	6.74	0.00	9/8/2004	10.11	ND	14.70	-62	6.31	1.37
9/26/2006	10.47	ND	15.87	-142	8.67	0.00	9/20/2005	10.5	ND	13.48	-110	6.9	0.00
3/7/2007	9.18	ND	13.96	-147	6.92	6.25	9/26/2006	10.44	ND	13.94	-154	8.75	0.00
6/7/2007	9.07	ND	15.0	-95	5.99	0.00	3/7/2007	7.88	ND	13.75	78	9.20	9.52
9/19/2007	10.55	ND	15.7	-87	6.08	0.19	6/7/2007	8.85	ND	14.4	-186	7.50	0.10
12/19/2007	8.20	ND	14.54	-62	6.85	0.99	9/18/2007	10.52	ND	15.1	-133	6.41	0.09
3/26/2008	8.44	NM	NM	NM	NM	NM	12/18/2007	8.27	ND	13.18	-119	6.85	3.75
9/23/2008	10.81	ND	14.51	-102	6.58	0	3/26/2008	8.09	NM	NM	NM	NM	NM
3/18/2009	9.06	0.01	13.44	-118	6.67	1.20	9/22/2008	10.35	ND	14.47	-105	5.75	0
9/23/2009	10.26	Sheen	14.68	49	6.30	0.12	9/23/2009	9.79	ND	15.32	9	7.33	0.03
3/17/2010	10.38	ND	13.1	-54	6.32	0.00	3/17/2010	10.15	ND	12.5	229	7.51	2.70
9/8/2010	10.90	ND	15.3	-105	4.76	3.49	9/8/2010	10.68	ND	14.4	115	4.95	2.42
3/9/2011	6.80	ND	11.2	-175	8.10	0.80	3/9/2011	7.20	ND	12.6	-92	8.19	6.95
9/20/2011	10.18	ND	11.52	-175	7.24	0.00	9/20/2011	9.79	ND	11.88	-199	8.29	0.00
3/14/2012	6.70	ND	9.77	-135	6.33	1.72	3/14/2012	6.42	ND	8.21	-93	7.43	4.49
9/20/2012	9.89	ND	14.1	-67	6.71	4.38	9/20/2012	9.02	ND	13.9	-86	6.69	0.30
3/13/2013	9.30	Sheen	13.47	-145	6.76	1.32	3/14/2013	8.67	ND	12.09	-84	6.53	0.65
9/18/2013	10.03	ND	15.1	7	5.56	0.53	9/18/2013	9.21	ND	19.23	-54	6.05	0.28
3/6/2014	5.81	ND	12.88	-99	6.01	0.50	3/7/2014	5.46	ND	4.24	-58	7.04	0.00
9/29/2014	9.73	ND	14.79	-89	6.29	0.00	9/30/2014	9.42	ND	14.93	-130	7.06	0.00
3/3/2015	7.69	ND	13.31	-148	6.55	0.00	3/315	7.87	ND	13.75	-148	6.71	0.00
9/15/2015	10.20	ND	13.85	-109	6.18	0.00	9/14/2015	10.13	ND	13.42	-171	7.87	0.00
3/23/2016	6.58	ND	12.02	-35	6.42	0.52	3/23/2016	6.51	ND	11.98	-26	6.79	0.00
9/14/2016	10.48	ND	20.67	-123	6.53	2.51	9/14/2016	9.76	ND	23.26	-168	7.04	4.11
3/22/2017	3.70	ND	13.29	-2	7.00	0.00	3/22/2017	3.43	ND	12.99	-23	7.25	1.00
9/27/2017	10.11	Trace	21.71	28	6.60	0.00	9/28/2017	9.89	ND	18.17	11	6.83	0.00
3/21/2018	8.08	Trace	12.90	-83	6.08	0.96	3/21/2018	8.08	ND	13.07	-97	6.05	0.89
9/12/2018	9.99	ND	13.56	-58	7.99	0.00	9/12/2018	10.20	ND	16.39	-16	7.18	0.00
3/21/2019	8.97	Sheen	12.32	-72	6.78	0.18	3/21/2019	8.74	ND	12.54	-100	6.8	1.47
9/24/2019	10.30	Trace	16.69	-70	6.56	0.20	9/24/2019	10.00	ND	16.05	-73	6.7	0.28
4/1/2020	4.14	0.075	13.84	-65	6.64	0.00	4/1/2020	8.90	ND	13.12	-97	6.99	0.00
9/14/2021	10.06	Trace	19.39	-54	6.29	0.00	9/14/2021	9.43	ND	19.50	-12	6.93	0.00
TD:	34.73						TD:	50					

Notes:

[a]Depth to water, product thickness and reduction/oxidation potential measured on 3/2/99. Temperature and dissolved oxygen measured on 3/3/99.

[b]Top of casing elevation lowered 3/1/99 at LNAPL collection system installation.

NA = Not Available

ND = Not Detected

NM = Not Measured

TD = Total Depth of Well

mV = millivolts

°C = degrees Celsius

mg/L = milligrams per liter

WA=Well abandoned 2/28/07 - 3/1/07

AV = Air Vent Well

Table A-2

BIOVENTING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
BV-01							**BV-02**						
10/21/1998	NM	NM	NM	NM	NM	NM	10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM	10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM	10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	NM	NM	12/2/1998	ND[a]	ND	NM	NM	NM	NM
1/22/1999	ND[a]	ND	NM	NM	NM	NM	1/22/1999	ND[a]	ND	NM	NM	NM	NM
3/2/99[b]	10.15	ND	NM	NM	NM	NM	3/2/99[b]	10.25	ND	NM	NM	NM	NM
5/18/1999	10.28	ND	NM	NM	NM	NM	5/18/1999	10.33	ND	NM	NM	NM	NM
9/27/1999	10.36	ND	NM	NM	NM	NM	9/27/1999	10.38	ND	NM	NM	NM	NM
12/1/1999	10.14	ND	NM	NM	NM	NM	12/1/1999	10.27	ND	NM	NM	NM	NM
1/18/2000	10.09	ND	NM	NM	NM	NM	1/18/2000	10.21	ND	NM	NM	NM	NM
4/24/2000	10.20	ND	NM	NM	NM	NM	4/24/2000	10.28	ND	NM	NM	NM	NM
9/13/2000	10.34	ND	NM	NM	NM	NM	9/13/2000	10.36	ND	NM	NM	NM	NM
12/21/2000	10.25	ND	NM	NM	NM	NM	12/21/2000	10.27	ND	NM	NM	NM	NM
4/5/2001	10.18	ND	NM	NM	NM	NM	4/5/2001	10.29	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM	8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	10.18	ND	NM	NA	6.73	NM	2/6/2002	10.50	ND	11.6	NA	7.04	5.90
9/11/2002	NM	NM	NM	NM	NM	NM	9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM	12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM	3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM	6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM	9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM	12/11/2003	NM	NM	NM	NM	NM	NM
WA							WA						
TD:	10.40						TD:	10.45					
BV-03							**BV-04**						
10/21/1998	NM	NM	NM	NM	NM	NM	10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM	10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM	10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	NM	NM	12/2/1998	ND[a]	ND	NM	NM	NM	NM
1/22/1999	ND[a]	ND	NM	NM	NM	NM	1/22/1999	ND[a]	ND	NM	NM	NM	NM
3/2/99[b]	11.39	ND	NM	NM	NM	NM	3/2/99[b]	14.02	ND	NM	NM	NM	NM
5/18/1999	11.52	ND	NM	NM	NM	NM	5/18/1999	12.41	ND	NM	NM	NM	NM
9/27/1999	11.45	ND	NM	NM	NM	NM	9/27/1999	TRACE	ND	NM	NM	NM	NM
12/1/1999	11.45	ND	NM	NM	NM	NM	12/1/1999	14.53	ND	NM	NM	NM	NM
1/18/2000	11.39	ND	NM	NM	NM	NM	1/18/2000	14.46	ND	NM	NM	NM	NM
4/24/2000	11.40	ND	NM	NM	NM	NM	4/24/2000	14.50	ND	NM	NM	NM	NM
9/13/2000	11.47	ND	NM	NM	NM	NM	9/13/2000	14.49	ND	NM	NM	NM	NM
12/20/2000	11.52	ND	NM	NM	NM	NM	12/20/2000	14.48	ND	NM	NM	NM	NM
4/5/2001	11.47	ND	NM	NM	NM	NM	4/5/2001	14.52	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM	8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	11.62	ND	NA	NA	6.93	NA	2/6/2002	14.52	ND	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM	9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM	12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM	3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM	6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM	9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM	12/11/2003	NM	NM	NM	NM	NM	NM
WA							WA						
TD:	11.72						TD:	14.58					

Table A-2

BIOVENTING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)	DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
BV-05							**BV-06**						
10/21/1998	NM	NM	NM	NM	NM	NM	10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM	10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM	10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	NM	NM	12/2/1998	ND[a]	ND	NM	NM	NM	NM
1/22/1999	ND[a]	ND	NM	NM	NM	NM	1/22/1999	11.14	ND	NM	NM	NM	NM
3/2/99[b]	10.27	ND	12.4	-21	6.47	1.5	3/2/99[b]	12.11	ND	NM	NM	NM	NM
5/18/1999	11.55	ND	NM	NM	NM	NM	5/18/1999	12.22	ND	NM	NM	NM	NM
9/27/1999	TRACE	ND	NM	NM	NM	NM	9/27/1999	12.23	ND	NM	NM	NM	NM
12/1/1999	ND	ND	NM	NM	NM	NM	12/1/1999	12.18	ND	NM	NM	NM	NM
1/18/2000	11.73	ND	NM	NM	NM	NM	1/18/2000	12.10	ND	NM	NM	NM	NM
4/24/2000	ND	ND	NM	NM	NM	NM	4/24/2000	12.12	ND	NM	NM	NM	NM
9/13/2000	11.78	ND	NM	NM	NM	NM	9/13/2000	12.17	ND	NM	NM	NM	NM
12/21/2000	11.75	ND	NM	NM	NM	NM	12/21/2000	12.19	ND	NM	NM	NM	NM
4/5/2001	11.81	ND	NM	NM	NM	NM	4/5/2001	12.17	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM	8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	ND	ND	NM	NM	NM	NM	2/6/2002	12.38	ND	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM	9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM	12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM	3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM	6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM	9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM	12/11/2003	NM	NM	NM	NM	NM	NM
WA							WA						
TD:	11.81						TD:	12.37					
BV-07							**BV-08**						
10/21/1998	NM	NM	NM	NM	NM	NM	10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM	10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM	10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	NM	NM	12/2/1998	ND[a]	ND	NM	NM	NM	NM
1/22/1999	15.09	ND	NM	NM	NM	NM	1/22/1999	14.41	ND	NM	NM	NM	NM
3/2/99[b]	13.91	ND	15	-73	6.33	0.96	3/2/99[b]	14.39	ND	17.3	-29	6.59	1.16
5/18/1999	15.80	ND	15.5	-66	6.49	0.32	5/18/1999	14.4	ND	17.2	-10	6.55	3.28
9/27/1999	15.77	ND	NM	NM	NM	NM	9/27/1999	14.34	ND	17.7	-15	6.40	1.85
12/1/1999	15.72	ND	NM	NM	NM	NM	12/1/1999	14.32	ND	17.1	-30	6.30	3.64
1/18/2000	15.73	ND	NM	NM	NM	NM	1/18/2000	14.33	ND	17.1	-47	5.41	2.57
4/24/2000	15.74	ND	NM	NM	NM	NM	4/24/2000	14.30	ND	18.8	108	4.70	2.64
9/13/2000	15.75	ND	NM	NM	NM	NM	9/13/2000	14.54	ND	NM	NM	NM	NM
12/21/2000	15.73	ND	NM	NM	NM	NM	12/21/2000	14.62	ND	NM	NM	NM	NM
4/5/2001	15.77	ND	NM	NM	NM	NM	4/5/2001	14.83	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM	8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	15.84	ND	13.9	NA	1.65	3.10	2/6/2002	14.91	ND	14.1	-101.1	7.25	3.44
9/11/2002	NM	NM	NM	NM	NM	NM	9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM	12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM	3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM	6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM	9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM	12/11/2003	NM	NM	NM	NM	NM	NM
WA							WA						
TD:	15.98						TD:	14.97					

Table A-2

BIOVENTING WELL GROUNDWATER MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
BV-09						
10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	MN	NM
1/22/1999	15.21	ND	NM	NM	NM	NM
3/2/99[b]	14.65	ND	17.3	-13	6.53	6.61
5/18/1999	16.58	ND	16.8	-29	6.81	1.54
9/27/1999	ND	ND	NM	NM	NM	NM
12/1/1999	ND	ND	NM	NM	NM	NM
1/18/2000	16.48	ND	16.9	NM	6.14	4.98
4/24/2000	ND	ND	NM	NM	NM	NM
9/13/2000	17.11	ND	NM	NM	NM	NM
12/21/2000	17.11	ND	NM	NM	NM	NM
4/5/2001	17.11	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	ND	ND	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM
WA						
TD:	17.11					
BV-11						
10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	NM	NM
1/22/1999	ND[a]	ND	NM	NM	NM	NM
3/2/99[b]	11.13	ND	13	-37	6.04	0.98
5/18/1999	11.71	ND	13.7	-88	6.38	2.52
9/27/1999	11.76	ND	NM	NM	NM	NM
12/1/1999	ND	ND	NM	NM	NM	NM
1/18/2000	11.65	ND	NM	NM	NM	NM
4/24/2000	11.67	ND	NM	NM	NM	NM
9/13/2000	11.68	ND	NM	NM	NM	NM
12/21/2000	11.76	ND	NM	NM	NM	NM
4/5/2001	11.49	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	11.84	ND	11.4	NA	6.95	7.30
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM
3/10/2004	NM	NM	NM	NM	NM	NM
WA						
TD:	11.89					

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (^{0}C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
BV-10						
10/21/1998	NM	NM	NM	NM	NM	NM
10/22/1998	ND[a]	ND	NM	NM	NM	NM
10/29/1998	ND[a]	ND	NM	NM	NM	NM
12/2/1998	ND[a]	ND	NM	NM	NM	NM
1/22/1999	ND[a]	ND	NM	NM	NM	NM
3/2/99[b]	14.5	ND	NM	NM	NM	NM
5/18/1999	14.73	ND	NM	NM	NM	NM
9/27/1999	14.81	ND	NM	NM	NM	NM
12/1/1999	14.76	ND	NM	NM	NM	NM
1/18/2000	14.60	ND	NM	NM	NM	NM
4/24/2000	14.70	ND	NM	NM	NM	NM
9/13/2000	14.78	ND	NM	NM	NM	NM
12/21/2000	14.82	ND	NM	NM	NM	NM
4/5/2001	14.79	ND	NM	NM	NM	NM
8/20/2001	ND[a]	ND	NM	NM	NM	NM
2/6/2002	14.84	ND	13.10	NA	6.27	6.08
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	NM	NM	NM	NM	NM	NM
3/4/2003	NM	NM	NM	NM	NM	NM
6/12/2003	NM	NM	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	NM	NM	NM	NM	NM
WA						
TD:	14.88					

Table A-2

BIOVENTING WELL GROUNDWATER MONITORING DATA SUMMARY

MAINTENANCE FACILITY AREA

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
BV-12						
6/19/2002	4.33	NM	NM	NM	NM	NM
6/20/2002	4.20	NM	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	5.12	ND	12.74	3.2	6.79	4.17
3/4/2003	4.77	ND	NM	NM	NM	NM
6/12/2003	4.59	ND	15.7	99	6.29	1.22
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	3.35	ND	8.71	196	6.45	12.17
3/10/2004	3.94	ND	NM	NM	NM	NM
9/20/2005	5.16	ND	18.09	162	5.99	4.57
9/26/2006	4.79	ND	NM	NM	NM	NM
3/8/2007	NM	ND	10.01	226	5.7	11.79
6/7/2007	NM	NM	NM	NM	NM	NM
9/19/2007	NM	ND	18.7	2	6.25	7.83
12/19/2007	NM	NM	NM	NM	NM	NM
3/26/2008	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM
3/18/2009	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM
3/16/2010	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM
3/8/2011	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM
9/30/2014	NM	NM	NM	NM	NM	NM
9/15/2015	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM
TD:						
BV-14						
6/19/2002	3.09	NM	NM	NM	NM	NM
6/20/2002	2.53	NM	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	4.72	ND	13.22	-16	7.75	2.51
3/4/2003	NM[c]	NM	NM	NM	NM	NM
6/12/2003	4.48	Trace	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	NM	ND	NM	NM	NM	NM
3/10/2004	3.69	ND	NM	NM	NM	NM
9/20/2005	4.22	ND	18.04	-10	7.21	4.09
9/26/2006	3.79	ND	NM	NM	NM	NM
3/8/2007	NM	ND	9.4	159	6.25	12.57
6/7/2007	NM	NM	NM	NM	NM	NM
9/19/2007	NM	ND	18.5	27	7.90	4.00
12/19/2007	NM	NM	NM	NM	NM	NM
3/26/2008	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM
3/18/2009	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM
3/16/2010	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM
3/8/2011	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM
9/30/2014	NM	NM	NM	NM	NM	NM
9/15/2015	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM
TD:						

DATE	DEPTH TO GROUND-WATER (feet)	PRODUCT THICKNESS (feet)	TEMPER-ATURE (°C)	REDUCTION/ OXIDATION POTENTIAL (mV)	pH	DISSOLVED OXYGEN CONCEN-TRATION (mg/L)
BV-13[d]						
6/19/2002	3.43	NM	NM	NM	NM	NM
6/20/2002	3.44	NM	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	6.08	0.7	14.61	-57.4	6.98	1.61
3/4/2003	3.33	<0.5	NM	NM	NM	NM
6/12/2003	4.78	1.0	NM	NM	NM	NM
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	3.23	0.5	NM	NM	NM	NM
3/10/2004	3.21	Trace DNAPL	NM	NM	NM	NM
9/20/2005	4.86	0.5	NM	NM	NM	NM
9/26/2006	4.3	0.5	NM	NM	NM	NM
3/8/2007	NM	NM	NM	NM	NM	NM
6/7/2007	NM	0.1	NM	NM	NM	NM
9/20/2007	NM	0.75	NM	NM	NM	NM
12/19/2007	NM	NM	NM	NM	NM	NM
3/26/2008	NM	Trace DNAPL	NM	NM	NM	NM
9/25/2008	NM	0.5	NM	NM	NM	NM
3/18/2009	NM	0.25	NM	NM	NM	NM
9/23/2009	NM	0.10	NM	NM	NM	NM
3/16/2010	NM	Trace DNAPL	NM	NM	NM	NM
9/8/2010	NM	0.1	NM	NM	NM	NM
3/8/2011	NM	0.01	NM	NM	NM	NM
9/20/2011	NM	0.01	NM	NM	NM	NM
9/19/2012	NM	0.00	NM	NM	NM	NM
9/17/2013	NM	0.00	NM	NM	NM	NM
9/30/2014	3.75	0.01	NM	NM	NM	NM
9/15/2015	4.72	0.06	NM	NM	NM	NM
9/15/2016	4.37	0.05	NM	NM	NM	NM
9/28/2017	3.86	0.06	NM	NM	NM	NM
9/13/2018	3.77	0.15	NM	NM	NM	NM
9/25/2019	3.26	0.05	NM	NM	NM	NM
9/15/2020	3.94	0.05	NM	NM	NM	NM
TD:						
BV-15						
6/19/2002	5.25	NM	NM	NM	NM	NM
6/20/2002	2.07	NM	NM	NM	NM	NM
9/11/2002	NM	NM	NM	NM	NM	NM
12/2/2002	6.88	ND	14.91	-36	6.67	0.88
3/4/2003	6.08	NM	NM	NM	NM	NM
6/12/2003	NA	NA	NA	NA	NA	NA
9/10/2003	NM	NM	NM	NM	NM	NM
12/11/2003	4.98	ND	14.58	150	6.79	3.03
3/10/2004	5.77	ND	NM	NM	NM	NM
9/20/2005	6.2	ND	19.45	-4	6.16	5.15
9/26/2006	5.84	ND	NM	NM	NM	NM
3/8/2007	NM	ND	10.63	242	5.57	7.04
6/7/2007	NM	NM	NM	NM	NM	NM
9/19/2007	NM	ND	18.9	-132	6.32	3.73
12/19/2007	NM	NM	NM	NM	NM	NM
3/26/2008	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM
3/18/2009	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM
3/16/2010	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM
3/8/2011	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM
9/30/2014	NM	NM	NM	NM	NM	NM
9/15/2015	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM
TD:						

Notes:

[a]Less than 0.5 ft of water detected in well sump.

[b]Depth to water and product thickness measured on 3/2/99. Dissolved oxygen, oxidation/reduction potential, and temperature measured on 3/3/99.

[c]Monitoring well vault flooded by surface water runoff during rain event on 3/4/03.

[d] Measurements of DNAPL collected from well BV-13 are presented in Table A-9 Groundwater data for wells BV-1 through BV-11 not collected since 12/03/03 due to system shutdown status. Wells are still inspected biannually for water. Bioventing system has been off since November 2007.

NA = Not Available
ND = Not Detected
NM = Not Measured
mV = millivolts
°C = degrees Celius
mg/L = milligrams per liter
< = Less than
WA=Well abandoned

Table A-3

BIOSPARGING WELL VAPOR MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
AV-01							
10/22/1998	5	-0.02	0.0	0.0	19.7	15	7.9
10/29/1998	0	0.00	2.4	0.2	15.4	20	5200
12/3/1998	0	0.00	0.0	0.0	21.0	3	7
3/2/1999	0	0.01	0.0	0.0	21.1	40	0
5/18/1999	0	0.00	0.0	0.0	19.8	13	6
9/28/1999	0	0.00	0.3	0.0	20.9	5	11
12/2/99[c]	0	4.65	0.0	0.0	21.1	7.5	0
1/19/2000	0	0.00	0.0	0.0	20.9	0.4	4.5
4/24/2000	NM	0.37	0.0	0.0	21.8	1.3	6.9
9/14/2000	0	0.27	0.2	0.1	20.4	2.7	1.75
12/20/2000	0	0.00	0.0	0.0	19.7	0	F0
4/6/2001	2	0.06	0.0	0.0	20.1	1.3	0
8/20/2001	0	0.04	0.0	0.0	20.6	2.2	1.3
2/6/2002	0	NM	0.0	0.0	20.4	66.60	-0.50
9/11/2002	0	NM	0.0	0.0	20.1	760	12.00
12/2/2002	0	NM	0.2	0.0	20.6	0.12	6.44
3/4/2003	0	NM	0.8	0.2	20.1	0.9	FO
6/12/2003	0	NM	0.2	0.1	20.1	1.0	NA
9/10/2003	0	NM	0.0	0.0	20.0	0.0	NM
12/11/2003	0	NM	0.5	0.0	21.0	0.0	NM
9/8/2004	0	NM	0.0	0.0	20.2	0.0	NM
9/20/2005	NA	0.00	0.0	0.0	20.7	0.0	NM
9/26/2006	NA	0.00	0.2	0.0	20.9	22.7	NM
9/19/2007	NM	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM	NM
9/29/2014	NM	NM	NM	NM	NM	NM	NM
9/14/2015	NM	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
AV-03							
10/22/1998	0	0.00	5.6	0.0	16.3	14	1050
10/29/1998	137	0.17	0.5	0.0	19.3	22	280
12/3/1998	14	0.00	0.0	0.0	21.0	2.1	8
3/2/99[b]	0/5	0.03/0.01	0.4/0.2	0.0/0.0	18.9/19.5	3/3	52/59
5/18/99[c]	0	0.01	0.0	0.0	19.9	15.0	7
9/28/99[c]	24	0.16	0.0	0.0	21.0	2.0	6
12/2/99[c]	0	0.00	0.0	0.0	21.1	46.8	54
1/19/2000	0	0.01	0.0	0.0	21.3	1.2	4.8
4/24/2000	NM	0.01	0.0	0.0	21.7	2.3	0
9/14/2000	0	1.59	0.2	0.1	20.1	0.0	0
12/20/2000	0	0.00	0.0	0.0	19.6	0.0	0
4/6/2001	0	0.10	0.0	0.0	10.7	11.4	1.5
8/20/2001	0	0.03	8.2	0.0	3.4	7.9	19.1
2/6/2002	0	NM	0.1	0.0	20.5	65.9	0
9/11/2002	0	NM	0.1	0.0	18.3	248.0	0.04
12/2/2002	0	NM	3.0	0.0	9.8	0.3	1.5
3/4/2003	0	NM	1.1	0.0	11.2	1.7	FO
6/12/2003	0	NM	1.0	0.1	17.0	0.9	NA
9/10/2003	0	NM	0.1	0.0	20.0	0.0	NM
12/11/2003	0	NM	2.9	0.1	6.1	0.0	NM
9/8/2004	0	NM	0.7	0.0	17.9	0.0	NM
9/20/2005	NA	0.00	1.3	0.0	19.0	0.00	NM
9/26/2006	NM	NM	NM	NM	NM	NM	NM
WA							

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
AV-02							
10/22/1998	0.5	0.01	0.0	0.0	20.0	13	38
10/29/1998	0	0.00	0.2	0.0	20.2	26	255
12/3/1998	0	0.00	0.0	0.0	21.1	6.5	15
3/2/1999	0	0.00	0.0	0.0	21.0	1.8	3.2
5/18/1999	1	0.06	0.0	0.0	19.7	8	0.0
9/28/1999	0	0.00	0.1	0.0	20.9	10	75
12/2/1999	0	0.13	0.0	0.0	21.1	22	34
1/19/2000	0	0.00	0.0	0.0	21.1	0.6	130
4/24/2000	NM	0.00	0.0	0.1	21.9	0.55	2100
9/14/2000	0	0.21	0.3	0.1	19.9	>2000	1.75
12/20/2000	0	0.00	0.0	0.0	19.4	0	4.6
4/6/2001	17	0.02	0.1	0.1	16.7	0	15
8/20/2001	0	0.01	0.0	0.0	20.5	1.9	2.9
2/6/2002	0	NM	0.0	0.0	20.6	65.33	-0.11
9/11/2002	0	NM	0.2	0.0	19.4	0	0
12/2/2002	0	NM	0.3	0.1	13.0	0.24	412
3/4/2003	0	NM	0.6	0.1	15.5	0.63	FO
6/12/2003	0	NM	0.1	0.1	19.8	0.59	NA
9/10/2003	0	NM	0.0	0.0	19.0	0	NM
12/11/2003	0	NM	0.3	0.2	12.4	0	NM
9/8/2004	0	NM	0.0	0.0	19.0	0	NM
9/20/2005	NA	0	0.0	0.0	20.1	0.6	NM
9/26/2006	NA	0	0.0	11.2	20.5	0	NM
9/19/2007	NM	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM	NM
9/29/2014	NM	NM	NM	NM	NM	NM	NM
9/14/2015	NM	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
AV-04							
10/22/1998	20	0.00	9.1	4.1	0.0	4	FO
10/29/1998	130	0.21	0.6	0.0	18.4	12	80
12/3/1998	83	-0.01	0.0	0.0	20.9	3.5	31
3/2/99[b]	0/0	0.00/0.00	0.0/0.0	0.0/0.0	20.7/21.0	10/11	345/310
5/18/99[c]	0	0.02	0.0	0.0	20.5	16	3
9/28/99[c]	219	0.73	0.4	0.0	20.5	9	24
12/2/99[c]	330	16.01	0.0	0.0	22.7	42.7	12
1/19/2000	102	0.28	0.0	0.0	20.4	0.8	3.4
4/24/2000	NM	-0.06	0.0	0.0	21.9	3.4	12.8
9/14/2000	305	6.2	0.2	0.1	19.9	0.0	0.0
12/20/2000	90	0.24	0.1	0.0	19.4	0.7	14.6
4/6/2001	57	1.55	0.7	0.0	19.4	0.9	2.0
8/20/2001	0	0.06	0.5	0.0	19.9	28.1	0.0
2/6/2002	0	NM	0.0	0.0	20.4	63.70	-0.80
9/11/2002	0	NM	6.1	0.0	6.9	13.2	FO
12/2/2002	0	NM	6.2	0.0	9.5	0.82	FO
3/4/2003	0	NM	0.1	0.0	20.8	0.0	FO
6/12/2003	0	NM	0.2	0.1	19.7	0.06	NA
9/10/2003	0	NM	0.0	0.0	20.3	0	NM
12/11/2003	0	NM	2.2	0.0	18.2	0	NM
9/8/2004	0	NM	0.0	0.0	20.2	0	NM
9/20/2005	NA	0.00	0.6	0.0	19.5	0	NM
9/26/2006	NM	NM	NM	NM	NM	NM	NM
WA							

Table A-3

BIOSPARGING WELL VAPOR MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
AV-05							
10/22/1998	4	0.02	7.0	0.0	8.3	3	FO
10/29/1998	63	0.02	2.7	0.0	13.8	12	11
12/3/1998	41	0.03	0.0	0.0	21.1	3	2
3/2/99[b]	0/3	0.01/0.00	0.0/0.0	0.0/0.0	17.5/14.3	5/3	27/20
5/18/99[c]	0	0.01	0.0	0.0	19.4	20	4
9/28/99[c]	53	0.06	0.3	0.0	20.6	1	3
12/2/1999	0	0.00	0.0	0.0	21.4	17.8	8
1/19/2000	0	0.02	0.0	0.0	21.4	0.6	318
4/24/2000	NM	-0.01	0.0	0.0	21.8	3.5	0
9/14/2000	52	3.1	0.1	0.1	20.5	0	0
12/20/2000	44	0.11	0.0	0.0	19.5	0.8	0
4/6/2001	45	1.92	0.0	0.0	20.0	8.1	0
8/20/2001	0	0.03	5.2	0.0	5.4	9.1	0
2/6/2002	0	NM	0.0	0.0	20.4	63.7	FO
9/11/2002	0	NM	4.9	0.0	5.5	144	FO
12/2/2002	0	NM	6.0	0.0	5.1	2.35	FO
3/4/2003	0	NM	0.2	0.6	17.1	0.2	FO
6/12/2003	0	NM	0.1	0.0	19.9	0.6	2.0
9/10/2003	0	NM	0.0	0.0	20.3	0.0	NM
12/11/2003	0	NM	1.5	0.0	16.5	0.0	NM
9/8/2004	0	NM	0.0	0.0	20.2	0.0	NM
9/20/2005	NA	0.07	0.0	0.0	20.4	0.0	NM
9/26/2006	NM	NM	NM	NM	NM	NM	NM
WA							
AV-07							
10/22/1998	1	0.00	0.0	0.0	20.8	8.5	300
10/29/1998	0	0.00	0.1	0.0	20.1	12	600
12/3/1998	0	0.00	0.0	0.0	20.9	4.5	310
3/2/1999	1	-0.01	0.0	0.0	21.0	20	3
5/18/1999	0	0.04	0.0	0.0	20.6	11	3
9/28/1999	0	0.00	0.3	0.0	20.3	5	35
12/2/1999	0	0.00	0.0	0.0	21.0	19.8	26
1/19/2000	0	0.00	0.0	0.0	21.3	0.6	9.5
4/24/2000	NM	-0.07	0.0	0.0	21.7	1	18.1
9/14/2000	0	0.25	0.1	0.1	20.4	20	0.75
12/20/2000	0	-0.01	0.0	0.0	19.4	0	0
4/6/2001	0	0.00	1.5	0.0	16.3	0	2
8/20/2001	0	0.01	0.0	0.0	20.2	4.6	41.9
2/6/2002	0	NM	0.0	0.0	20.6	63.45	-0.32
9/11/2002	0	NM	0.0	0.0	18.6	0	0.3
12/2/2002	0	NM	0.6	0.0	17.2	0.43	155
3/4/2003	0	NM	0.0	0.0	20.2	0.21	FO
6/12/2003	0	NM	0.1	0.1	19.6	0.2	NA
9/10/2003	0	NM	0.1	0.1	17.9	0	NM
12/11/2003	0	NM	2.0	0.1	14.1	0	NM
9/8/2004	0	NM	0.0	0.0	20.1	0	NM
9/20/2005	NA	0.00	0.1	0.0	18.4	0	NM
9/26/2006	NM	NM	NM	NM	NM	NM	NM
WA							

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
AV-06							
10/22/1998	4	0.00	6.4	9.0	4.4	8	FO
10/29/1998	0	0.00	3.1	0.0	11.8	103	1460
12/3/1998	0	0.00	0.0	0.0	21.0	24	80
3/2/1999	0	0.00	0.0	0.0	21.1	16	15
5/18/1999	NM	NM	NM	NM	NM	NM	NM
9/28/1999	NM	NM	NM	NM	NM	NM	NM
12/2/1999	NM	NM	NM	NM	NM	NM	NM
1/19/2000	NM	NM	NM	NM	NM	NM	NM
4/24/2000	NM	NM	NM	NM	NM	NM	NM
9/14/2000	NM	NM	NM	NM	NM	NM	NM
12/20/2000	NM	NM	NM	NM	NM	NM	NM
4/6/2001	NM	NM	NM	NM	NM	NM	NM
8.20/01	NM	NM	NM	NM	NM	NM	NM
2/6/2002	0	NM	NM	NM	NM	NM	NM
9/11/2002	0	NM	NM	NM	NM	NM	NM
12/2/2002	0	NM	NM	NM	NM	NM	NM
3/4/2003	0	NM	NM	NM	NM	NM	NM
6/12/2003	0	NM	0.0	0.0	20.0	2.4	39
9/10/2003	0	NM	0.0	0.0	20.3	0	NM
12/11/2003	0	NM	0.6	0.1	20.9	0	NM
9/8/2004	0	NM	0.0	0.0	20.1	0	NM
9/20/2005	NA	0	0.0	0.0	20.6	0	NM
9/26/2006	NA	0	0.1	0.0	20.9	5.4	5.40
9/19/2007	NM	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM	NM
9/29/2014	NM	NM	NM	NM	NM	NM	NM
9/14/2015	NM	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
AV-08							
10/22/1998	0	0.00	0.0	0.0	19.9	4	13.1
10/29/1998	0	0.00	0.2	0.0	18.9	15	429
12/3/1998	0	-0.03	0.0	0.0	21.0	2.4	4
3/2/1999	3	0.00	0.0	0.0	21.1	20	3
5/18/1999	1	0.00	0.0	0.0	20.1	28	2
9/28/99[c]	0	0.01	0.0	0.0	20.9	2	6
12/2/99[c]	0	0.00	0.0	0.0	21.2	5.5	8
1/19/2000	0	0.00	0.0	0.0	21.3	0.7	4.3
4/24/2000	NM	-0.05	0.0	0.0	21.7	0.5	7
9/14/2000	0	9.4	0.2	0.1	20.3	0.0	0.0
12/20/2000	0	0.02	0.0	0.0	19.7	0.0	0.0
4/6/2001	0	0.04	0.0	0.0	20.0	0.0	0.0
8/20/2001	0	0.01	0.0	0.0	20.5	1.4	0.4
2/6/2002	0	NM	0.0	0.0	20.5	65.05	0.0
9/11/2002	0	NM	0.0	0.0	19.8	286	0.1
12/2/2002	0	NM	0.2	0.0	20.6	0.85	3.12
3/4/2003	0	NM	0.0	0.0	20.7	0.1	FO
6/12/2003	0	NM	0.3	0.1	19.7	0.6	NA
9/10/2003	0	NM	0.1	0.0	20.3	0.0	NM
12/11/2003	0	NM	0.3	0.0	21.0	0.0	NM
9/8/2004	0	NM	0.0	0.0	20.2	0.0	NM
9/20/2005	NA	0.00	0.0	0.0	20.6	0.0	NM
9/26/2006	NA	0.00	0.0	0.0	20.8	0.0	NM
9/19/2007	NM	NM	NM	NM	NM	NM	NM
9/25/2008	NM	NM	NM	NM	NM	NM	NM
9/23/2009	NM	NM	NM	NM	NM	NM	NM
9/8/2010	NM	NM	NM	NM	NM	NM	NM
9/20/2011	NM	NM	NM	NM	NM	NM	NM
9/19/2012	NM	NM	NM	NM	NM	NM	NM
9/17/2013	NM	NM	NM	NM	NM	NM	NM
9/29/2014	NM	NM	NM	NM	NM	NM	NM
9/14/2015	NM	NM	NM	NM	NM	NM	NM
9/15/2016	NM	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM

Table A-3

BIOSPARGING WELL VAPOR MONITORING DATA SUMMARY

MAINTENANCE FACILITY AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
AV-09							
9/11/2002	NA	NM	0.0	0.1	19.1	5	10
12/2/2002	NA	5.5	NM	NM	NM	NM	NM
3/4/2003	NA	60.0	0.5	0.0	20.7	5.8	NM
6/12/2003	NA	73.0	0.0	0.0	20.1	NA	NA
9/10/2003	NA	0.0	0.6	0.1	8.4	0	NM
12/11/2003	NA	70	0.2	0.0	21.2	0	NM
3/10/2004	NA	41	0.0	0.1	20.6	NA	NM
9/8/2004	NA	42	0.0	0.0	19.8	0	NM
3/15/2005	NA	49	NM	NM	NM	NM	NM
9/20/2005	NA	52.0	0.2	0.0	20.2	NM	NM
9/26/2006	NA	1.0	0.5	1.7	18.3	0	NM
9/19/2007	NA	NM	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/29/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/15/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
AV-11							
9/11/2002	NA	NM	0.1	0.1	18.8	0	27
12/2/2002	NA	NM[d]	NM	NM	NM	NM	NM
3/4/2003	NA	0.00	2.9	0.5	14.3	0.32	NM
6/12/2003	NA	0.00	0.1	0.1	19.4	0.6	NA
9/10/2003	NA	0.05	3.2	4.3	0.0	7.5	NM
12/11/2003	NA	17	3.4	3.3	14.2	0	NM
3/10/2004	NA	18	2.8	1.9	13.1	NA	NM
9/8/2004	NA	3	5.9	8.8	1.0	0	NM
3/15/2005	NA	-3	NM	NM	NM	NM	NM
9/20/2005	NA	1.20	3.0	0.6	11.5	NM	NM
9/26/2006	NA	0.00	1.8	1.4	16.2	0.00	NM
9/19/2007	NA	NM	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/14/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
AV-13							
9/11/2002	NA	NM	28.6	20.1	0.1	134	FO
12/2/2002	NA	0.00	NM	NM	NM	NM	NM
3/4/2003	NA	0.00	6.0	37.4	0.0	0.2	NM
6/12/2003	NA	1.50	9.2	18.6	3.4	0	NA
9/10/2003	NA	0.00	13.5	4.2	0.0	37	NM
12/11/2003	NA	2.20	13.5	11.0	0.0	3.8	NM
3/10/2004	NA	-6.0	6.0	9.5	8.8	0.6	NM
9/8/2004	NA	0.0	15.1	10.6	0.0	0	NM
3/15/2005	NA	0.0	NM	NM	NM	NM	NM
9/20/2005	NA	0.04	16.4	13.7	3	NM	NM
9/26/2006	NA	0.00	14.3	9.8	3.3	10.50	NM
9/19/2007	NA	NM	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/14/2015	NA	NM	NM	NM	NM	NM	NM
9/14/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
AV-10							
9/11/2002	NA	NM	3.5	0.1	12.1	140	460
12/2/2002	NA	22	NM	NM	NM	NM	NM
3/4/2003	NA	25	3.6	0.6	16.6	20	NM
6/12/2003	NA	46	0.8	0.1	18.6	16	NA
9/10/2003	NA	29	1.5	0.0	18.5	160	NM
12/11/2003	NA	35	1.4	1.1	18.1	70	NM
3/10/2004	NA	22	1.2	0.0	19.2	45	NM
9/8/2004	NA	26	1.4	0.0	18.3	110	NM
3/15/2005	NA	36	NM	NM	NM	NM	NM
9/20/2005	NA	8	6.9	0.0	16.1	NM	NM
9/26/2006	NA	0	4.9	0.0	11.2	0	NM
9/19/2007	NA	NM	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/15/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
AV-12							
9/11/2002	NA	NM	0.0	0.1	8.8	0	11
12/2/2002	NA	16.00	NM	NM	NM	NM	NM
3/4/2003	NA	30	5.5	0.6	0.0	0.61	NM
6/12/2003	NA	40	0.0	0.0	19.4	0.09	NA
9/10/2003	NA	20	0.2	0.0	20.0	0	NM
12/11/2003	NA	4.6	0.6	0.2	20.4	0	NM
3/10/2004	NA	23	0.2	0.1	20.5	0.6	NM
9/8/2004	NA	25	0.1	0.0	19.7	0	NM
3/15/2005	NA	27	NM	NM	NM	NM	NM
9/20/2005	NA	28	0.0	0.0	20.8	NM	NM
9/26/2006	NA	0	0.5	0.1	19.6	0.00	NM
9/19/2007	NA	NM	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/14/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM

Notes:

[a]Minimum detection limit is 5 standard feet per minute

[b]First measurement with valve closed. Second measurement with valve open for more than 30 minutes.

[c]Valve closed after monitoring

[d]Forklift parked on well box lid.

FID = Flame Ionization Detector

FO = Flame Ionization detector flamed out

in H_2O = inches of water column

NA = Not Available

ND = Not Detected

NM = Not Measured

%V = Percent by Volume

PID = Photoionization Detector

ppmv = parts per million by volume

WA=Well abandoned

Table A-4

BIOVENTING WELL VAPOR MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
BV-01							
10/22/1998	0	-0.01	0.1	0.0	19.6	6.5	5.8
10/29/1998	6	0.23	14.3	6.7	1.1	16	FO
12/3/1998	10	-0.01	6.4	2.3	0.2	5.7	FO
3/2/1999	25	0.01	4.8	0.0	11.0	41	FO
5/18/1999	9	0.14	4.8	0.0	13.3	12	57
9/28/1999	5	0.01	7.2	0.0	10.5	5	24
12/2/1999	7	0.00	0.0	0.0	21.0	7.5	18.8
1/19/2000	13	0.00	4.5	0.0	11.7	8.4	12.7
4/24/2000	0	-0.06	5.4	0.0	13.0	2.5	6.3
9/14/2000	5	0.47	11.1	0.0	4.4	0	0
12/20/2000	0	0.00	13.0	0.0	2.6	0	0
4/6/2001	0	0.12	12.5	0.0	1.3	2.1	100
8/20/2001	0	0.03	0.0	0.0	20.5	2.7	2.4
2/6/2002	0	NM	6.4	0.0	8.6	74.19	FO
9/11/2002	NA	NM	9.1	0.0	1.7	940	FO
12/2/2002	NA	NM	11.0	0.0	0.0	0.4	FO
3/4/2003	NA	NM	4.2	0.9	6.0	0.6	NM
6/12/2003	NA	NM	7.4	0.6	2.9	4.2	NA
9/10/2003	NA	NM	9.7	0.4	0.0	0	NM
12/11/2003	NA	NM	11.1	0.7	0.0	9	NM
9/8/2004	NA	NM	10.0	0.0	0.0	0	NM
9/20/2005	NA	0.00	11.8	0.2	1.0	0	NM
WA							
BV-03							
10/22/1998	0	-0.01	6.8	2.6	4.0	2.6	FO
10/29/1998	11	0.00	2.8	0.3	10.0	17	FO
12/3/1998	20	0.03	0.8	0.0	19.2	19.1	742
3/2/1999	26	0.04	0.8	0.0	19.4	17	23
5/18/1999	27	0.07	0.8	0.0	18.2	13	10
9/28/1999	5	0.01	3.5	0.0	15.5	3	12
12/2/1999	48	0.19	0.0	0.0	21.0	36.2	5
1/19/2000	53	0.07	0.4	0.0	20.6	3.4	1
4/24/2000	31	0.00	0.4	0.0	21.3	2.6	75
9/14/2000	2	-3.28	1.0	0.1	18.7	0	0
12/20/2000	12	0.02	0.4	0.0	18.8	0.1	14.5
4/6/2001	0	0.98	2.5	0.0	17.1	0	0
8/20/2001	0	0.13	0.9	0.0	19.3	2.7	0.9
2/6/2002	0	NM	2.7	0.0	14.5	66.40	0
9/11/2002	NA	NM	0.0	0.0	20.0	0	0
12/2/2002	NA	NM	7.0	0.6	0.3	0.7	FO
3/4/2003	NA	NM	9.3	0.4	0.0	0.3	NM
6/12/2003	NA	NM	5.1	1.2	0.6	0.00	NA
9/10/2003	NA	NM	0.0	0.0	20.4	19.00	NM
12/11/2003	NA	NM	11.6	1.3	0.0	0.00	NM
9/8/2004	NA	NM	4.1	0.8	0.0	0.00	NM
9/20/2005	NA	0.00	7.0	0.8	1.0	0.00	NM
WA							

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
BV-02							
10/22/1998	0	0.00	0.1	0.0	19.6	8.7	19.2
10/29/1998	0	0.00	15	5.6	0.0	27	FO
12/3/1998	3	0.00	10	0.0	1.3	6	FO
3/2/1999	45	0.05	5.7	0.0	5.7	67	FO
5/18/1999	34	0.09	1.5	0.0	17.5	9	26
9/28/1999	20	0.05	2.9	0.0	16.7	5	14
12/2/1999	5	0.00	0.0	0.0	21.0	12.0	0
1/19/2000	24	0.00	2.3	0.0	17.2	0.5	9
4/24/2000	11	-0.07	1.9	0.0	19.0	2.5	65
9/14/2000	8	0.29	3.5	0.1	15.5	0.0	0
12/20/2000	16	0.09	3.8	0.0	14.9	0.0	11.7
4/6/2001	0	0.19	7.5	0.0	5.7	1.5	0
8/20/2001	0	0.05	0.0	0.0	20.6	8.2	1.1
2/6/2002	0	NM	6.5	0.0	8.1	73.12	FO
9/11/2002	NA	NM	0.3	0.0	5.4	1100	FO
12/2/2002	NA	NM	10.7	0.9	0.0	0.37	FO
3/4/2003	NA	NM	9.3	1.3	0.0	0.90	NM
6/12/2003	NA	NM	6.7	1.3	6.8	4.20	NA
9/10/2003	NA	NM	0.0	0.0	20.0	0.00	NM
12/11/2003	NA	NM	6.7	0.0	6.0	6.20	NM
9/8/2004	NA	NA	0.0	0.0	20.1	0.00	NM
9/20/2005	NA	0.00	6.0	0.0	9.3	0.00	NM
WA							
BV-04							
10/22/1998	0	0.015	8.3	1.4	1.1	6	FO
10/29/1998	42	0.01	4.2	0.0	10.3	8	FO
12/3/1998	63	0.44	3.3	0.0	19.9	4	2.4
3/2/1999	89	0.53	0.2	0.0	20.3	11	4.0
5/18/1999	121	0.31	0.05	0.0	18.8	5	0.0
9/28/1999	57	0.10	2.1	0.0	18.1	3	5.0
12/2/1999	84	0.76	0.0	0.0	21.1	17.7	0.0
1/19/2000	144	0.56	0.3	0.0	20.8	0.6	1.5
4/24/2000	150	-0.06	0.3	0.0	21.5	1.5	8.5
9/14/2000	35	0.82	0.3	0.2	18.3	50>	0
12/20/2000	45	0.14	1.1	0.0	18.7	0	0
4/6/2001	38	0.56	2.6	0.0	17.1	2.8	0
8/20/2001	0	0.04	1.9	0.0	16.2	1.8	1.3
2/6/2002	0	NM	6.7	0.0	7.2	70.15	FO
9/11/2002	NA	NM	0.0	0.0	19.6	0.00	0
12/2/2002	NA	NM	10.2	0.0	1.7	0.91	0
3/4/2003	NA	NM	5.3	0.4	0.0	0.60	NM
6/12/2003	NA	NM	6.6	0.1	3.5	0.08	NA
9/10/2003	NA	NM	4.3	0.0	12.4	0.00	NM
12/11/2003	NA	NM	2.3	0.0	18.2	0.00	NM
9/8/2004	NA	NM	0.0	0.0	20.1	0.00	NM
9/20/2005	NA	0.00	3.0	0.0	15.0	0.00	NM
WA							

Table A-4

BIOVENTING WELL VAPOR MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
BV-05							
10/22/1998	5	0.01	6.7	0.0	5.8	7	FO
10/29/1998	6	0.05	3.5	0.0	12.5	6	410
12/3/1998	10	0.04	0.3	0.0	20.1	2	128
3/2/1999	31	0.02	0.0	0.0	20.8	5	22
5/18/1999	5	0.04	1.3	0.0	17	14	6
9/28/1999	18	0.03	1.8	0.0	18.5	0.5	3
12/2/1999	75	0.00	0.0	0.0	21.1	21.7	5
1/19/2000	62	0.41	0.2	0.0	21	0.75	3.6
4/24/2000	67	0.12	0.4	0.0	21.4	2.7	38
9/14/2000	10	2.4	1.5	0.1	18.4	0	0
12/20/2000	28	0.00	0.2	0.0	19.3	1.9	3.8
4/6/2001	1	1.52	0.2	0.0	19.9	0	0
8/20/2001	0	0.02	0.5	0.0	19.5	0.9	0.4
2/6/2002	0	NM	2.6	0.0	12.4	65.20	2.90
9/11/2002	NA	NM	0.7	0.0	12.9	16.1	8.2
12/2/2002	NA	NM	5.3	0.2	0.0	3.1	FO
3/4/2003	NA	NM	3.7	0.6	0.0	2.3	NM
6/12/2003	NA	NM	2.6	0.0	4.0	0.26	NA
9/10/2003	NA	NM	0.0	0.0	20.2	0	NM
12/11/2003	NA	NM	4.2	0.0	13.8	0	NM
9/8/2004	NA	NM	0.0	0.0	20.2	0	NM
9/20/2005	NA	0.00	0.4	0.0	18.9	0	NM
WA							
BV-07							
10/22/1998	23	0.00	7.2	0.8	2.3	4.5	FO
10/29/1998	14	-0.09	5.9	0.0	1.8	10	FO
12/3/1998	9	0.00	5.7	0.0	9.7	12	FO
3/2/1999	73	0.42	2.9	0.0	15.9	5.2	14
5/18/1999	74	0.16	3.3	0.0	15.3	17	19
9/28/1999	33	0.00	7.9	0.0	9.0	3	FO
12/2/1999	50	0.00	0.0	0.0	20.9	72.7	12
1/19/2000	44	0.01	3.2	0.0	16.2	1	20
4/24/2000	32	0.00	0.0	0.0	21.9	4.5	250
9/14/2000	0	0.54	7.8	0.1	8.1	14.2	>100
12/20/2000	29	0.03	8.9	0.0	9.2	1.6	F.O.
4/6/2001	26	0.6	9.8	0.0	6.1	4.8	20
8/20/2001	0	0.04	1.8	0.0	11.4	3.48	73
2/6/2002	0	NM	7.8	0.0	7.2	69.3	FO
9/11/2002	NA	NM	8.2	0.1	4.0	210	FO
12/2/2002	NA	NM	6.0	0.0	9.8	1.61	FO
3/4/2003	NA	NM	6.8	1.4	0.5	4.5	NM
6/12/2003	NA	NM	0.0	0.0	20.0	2.6	160
9/10/2003	NA	NM	0.0	0.0	20.1	0	NM
12/11/2003	NA	NM	2.6	0.0	16.6	0	NM
9/8/2004	NA	NM	0.7	0.3	18.4	0	NM
9/20/2005	NA	0.00	4.1	0.0	12.9	0	NM
WA							

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENRATION (ppmv) PID	FID
BV-06							
10/22/1998	30	0.01	5.0	0.0	3.6	6.5	FO
10/29/1998	23	0.42	5.1	0.0	9.3	5	FO
12/3/1998	37	0.27	0.8	0.0	19.1	2.9	150
3/2/1999	67	0.50	0.3	0.0	20.3	16	29
5/18/1999	88	0.05	0.7	0.0	18.1	13	4
9/28/1999	33	0.03	1.9	0.0	18.2	1	6
12/2/1999	83	0.44	0.0	0.0	21.1	42.4	7
1/19/2000	84	0.67	0.3	0.0	20.3	1	5
4/24/2000	71	0.05	0.0	0.0	21.9	3.1	109
9/14/2000	0	0.72	1.7	0.1	17.9	13.8	0
12/20/2000	35	0.19	1.8	0.0	17.8	0.55	0
4/6/2001	39	0.71	3.2	0.0	15.9	18	0
8/20/2001	0	0.03	2.8	0.0	13.7	2.6	0.15
2/6/2002	0	NM	7.3	0.0	6.6	71.90	FO
9/11/2002	NA	NM	7.7	0.0	3.7	34.7	FO
12/2/2002	NA	NM	11.1	0.0	0.0	1.1	FO
3/4/2003	NA	NM	9.4	0.3	0.0	0.66	NM
6/12/2003	NA	NM	7.1	0.4	2.9	2.20	NA
9/10/2003	NA	NM	0.0	0.0	20.3	0.00	NM
12/11/2003	NA	NM	0.3	0.1	21.0	0.00	NM
9/8/2004	NA	NM	0.7	0.0	0.0	18.50	0
9/20/2005	NA	0	3.7	0.0	12.5	0.00	NM
WA							
BV-08							
10/22/1998	2	0.01	9.9	6.0	0.5	12.5	FO
10/29/1998	16	0.00	4.3	0.2	8.8	80	FO
12/3/1998	4	0.00	3	0.0	15.3	170	620
3/2/1999	62	0.19	2.5	0.0	17.4	128	175
5/18/1999	45	0.10	2.7	0.0	16.1	47	91
9/28/1999	23	0.00	7.6	0.0	10.6	32	50
12/2/1999	38	0.00	0.0	0.0	21.1	187	16.0
1/19/2000	30	0.02	3.6	0.0	16.1	8.5	36.0
4/24/2000	0	-0.02	0.0	0.0	21.8	8.2	530.0
9/14/2000	3	0.64	8.6	0.1	8.1	>2000	>1000
12/20/2000	NM	0.00	7.7	0.0	11.5	27	53.9
4/6/2001	0	0.2	12.4	0.0	3.8	1.2	25.0
8/20/2001	0	0.03	0.1	0.0	20.5	2.2	17.4
2/6/2002	0	NM	12.2	0.0	3.4	87.00	FO
9/11/2002	NA	NM	10.8	0.0	2.4	35	FO
12/2/2002	NA	NM	14.2	0.0	0.0	1.72	FO
3/4/2003	NA	NM	12.1	0.1	6.1	0.69	NM
6/12/2003	NA	NM	0.8	0.1	17.5	0.70	NA
9/10/2003	NA	NM	0.0	0.0	20.2	0.00	NM
12/11/2003	NA	NM	4.6	0.0	13.0	0.00	NM
9/8/2004	NA	NM	0.6	0.0	18.7	0.00	NM
9/20/2005	NA	0.00	2.9	0.0	15.4	0.00	NM
WA							

Table A-4

BIOVENTING WELL VAPOR MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
BV-09							
10/22/1998	2	0.01	7.5	0.1	6.0	6.5	FO
10/29/1998	45	0.02	5.5	0.0	9.5	14	FO
12/3/1998	16	0.04	5.5	0.0	10.2	3.6	FO
3/2/1999	127	0.48	1.0	0.0	19.7	35	1
5/18/1999	125	0.44	0.7	0.0	18.7	12	7
9/28/1999	110	0.37	1.4	0.0	19.1	20	46
12/2/1999	49	0.17	0.0	0.0	21.0	22.7	0
1/19/2000	15	0.32	1.4	0.0	19.3	0.7	4.6
4/24/2000	94	0.13	1.3	0.0	20.4	2.2	26
9/14/2000	9	0.98	1.7	0.2	17.7	32.5	1
12/20/2000	24	0.02	2.3	0.0	17.5	0	0.6
4/6/2001	0	0.24	8.1	0.0	10.8	0	0
8/20/2001	0	0.07	0.4	0.0	20.2	1.5	1.0
2/6/2002	0	NM	13.5	0.0	4.7	80.05	FO
9/11/2002	NA	NM	15.9	0.1	0.0	0	FO
12/2/2002	NA	NM	16.9	0.7	0.0	0.34	FO
3/4/2003	NA	NM	8.4	0.1	6.5	1.23	NM
6/12/2003	NA	NM	1.0	0.2	17.5	0.25	NA
9/10/2003	NA	NM	0.0	0.0	20.2	0	NM
12/11/2003	NA	NM	17.0	1.3	0.0	3.6	NM
9/8/2004	NA	NM	1.0	0.0	17.9	0	NM
9/20/2005	NA	0.00	3.8	0.1	15.5	0	NM
WA							
BV-11							
10/22/1998	0	0.00	0.3	0.0	19.2	5	3000
10/29/1998	0	0.00	2.1	2.4	13.1	14	FO
12/3/1998	0	0.00	3.6	0.1	10.4	16.4	FO
3/2/1999	3	0.00	2.6	0.0	16.7	12	127
5/18/1999	0	0.01	3.6	0.0	14.4	21	123
9/28/1999	0	0.01	0.1	0.0	20.7	1	3
12/2/1999	0	4.65	0.0	0.0	22.4	10.9	0
1/19/2000	0	0.00	3.7	0.0	16.0	2	20.7
4/24/2000	0	-0.06	3.0	0.0	17.5	6.1	400
9/14/2000	1	-0.76	4.6	0.2	13.9	0	0
12/20/2000	0	0.02	3.8	0.0	16.2	0.9	10.2
4/6/2001	3	0.59	7.9	0.0	9.1	0.3	8
8/20/2001	0	0.05	0.0	0.0	20.4	0.3	40.1
2/6/2002	0	NM	2.2	0.0	16.1	67.10	0.15
9/11/2002	NA	NM	3.2	0.0	10.1	12.7	0
12/2/2002	NA	NM	8.5	4.3	0.0	0.3	FO
3/4/2003	NA	NM	6.8	4.6	0.0	0	NM
6/12/2003	NA	NM	5.0	4.3	5.9	0.12	NA
9/10/2003	NA	NM	0.1	0.1	20.1	0	NM
12/11/2003	NA	NM	8.0	0.0	1.4	0	NM
9/8/2004	NA	NM	0.1	0.0	20.0	0	NM
9/20/2005	NA	0.00	2.0	0.0	15.5	0	NM
WA							

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
BV-10							
10/22/1998	0	0.00	6.7	0.0	1.9	6	FO
10/29/1998	5	0.00	5.7	0.0	1.9	12	FO
12/3/1998	48	0.21	0.6	0.0	19.9	4.5	21
3/2/1999	55	0.24	0.7	0.0	19.9	31	0
5/18/1999	66	0.20	0.9	0.0	18.5	18	1
9/28/1999	19	0.05	3.5	0.0	16.0	6	2
12/2/1999	73	0.30	0.0	0.0	20.6	18.4	7
1/19/2000	77	0.26	0.3	0.0	20.9	0.6	3.3
4/24/2000	74	0.01	0.3	0.0	21.4	2.3	21
9/14/2000	9	0.66	1.2	0.2	18.7	0	0
12/20/2000	33	NM	2.4	0.0	17.1	0	FO
4/6/2001	21	0.35	3.9	0.0	13.9	0	0
8/20/2001	0	-0.01	4.2	0.0	10.8	2.1	4.7
2/6/2002	0	NM	0.0	0.0	20.5	62.40	FO
9/11/2002	NA	NM	0.0	0.0	19.9	0.00	0
12/2/2002	NA	NM	0.1	0.0	20.7	0.15	-1.91
3/4/2003	NA	NM	0.0	0.0	20.7	1.20	NM
6/12/2003	NA	NM	0.2	0.1	19.1	0.50	NA
9/10/2003	NA	NM	0.0	0.0	20.4	0.00	NM
12/11/2003	NA	NM	6.2	0.0	4.6	0.00	NM
9/8/2004	NA	NM	1.8	0.0	16.8	0.00	NM
9/20/2005	NA	0	3.0	0.0	15.0	0.00	NM
WA							
V-01							
10/22/1998	NM	NM	NM	NM	NM	NM	NM
10/29/1998	NM	NM	5.8	6.0	3.0	2	FO
12/3/1998	NM	0.00	7.5	1.0	0.0	1.9	FO
3/2/1999	NM	0.03	3.1	0.0	14.4	70	11
5/18/1999	NM	0.12	3	0.0	15.0	5	1
9/28/1999	NM	0	7.9	0.0	8.4	8	FO
12/2/1999	0	0.02	0.0	0.0	21.2	6	0
1/19/2000	0	0.02	8.1	0.0	6.7	0.5	FO
4/24/2000	NM	0	7.1	0.0	9.1	2.7	FO
9/14/2000	0	0.12	8.2	0.1	8.3	0	0
12/20/2000	0	0.00	11.4	0.0	5.3	0	0
4/6/2001	0	0.04	11.1	0.1	2.3	0	0
8/20/2001	0	0.02	0.1	0.0	20.4	2.0	1.3
2/6/2002	0	NM	NM	NM	NM	NM	NM
9/11/2002	NA	NM	0.0	0.1	20.0	0.00	0
12/2/2002	NA	NM	0.1	0.0	20.8	0.20	0
3/4/2003	NA	NM	0.0	0.0	20.7	0.36	NM
6/12/2003	NA	NM	NM	NM	NM	NM	NM
9/10/2003	NA	NM	NM	NM	NM	NM	NM
12/11/2003	NA	NM	NM	NM	NM	NM	NM
9/8/2004	NA	NM	NM	NM	NM	NM	NM
9/20/2005	NA	0.00	0.0	0.0	20.8	0.00	NM
WA							

Table A-4

BIOVENTING WELL VAPOR MONITORING DATA SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
V-02							
10/22/1998	NM	NM	NM	NM	NM	NM	NM
10/29/1998	NM	NM	0.6	0.5	6.1	7	FO
12/3/1998	NM	-0.01	0.3	0.0	14.1	1.8	70.4
3/2/1999	NM	0.07	0.2	0.0	17.6	4.3	18
5/18/1999	NM	0.13	0.8	0.0	16.0	20	FO
9/28/1999	NM	0.00	2.3	0.0	11.9	13	8.5
12/2/1999	0	0.00	0.0	0.0	21.0	7.3	5
1/19/2000	0	0.01	0.5	0.0	18.7	2	4.3
4/24/2000	NM	0.00	1.1	0.0	19.1	2.8	0
9/14/2000	0	0.09	2.0	0.1	11.4	0	0
12/20/2000	0	-0.01	2.0	0.1	11.4	0	FO
4/6/2001	0	0.00	1.9	0.0	7.8	0	1
8/20/2001	0	0.01	0.1	0.0	19.6	4.7	0.8
2/6/2002	0	NM	NM	NM	NM	NM	NM
9/11/2002	NA	NM	0.3	0.1	17.5	0	0
12/2/2002	NA	NM	0.6	0.0	18.1	1.21	0
3/4/2003	NA	NM	0.0	0.0	20.8	0.61	NM
6/12/2003	NA	NM	NM	NM	NM	NM	NM
9/10/2003	NA	NM	NM	NM	NM	NM	NM
12/11/2003	NA	NM	NM	NM	NM	NM	NM
9/8/2004	NA	NM	NM	NM	NM	NM	NM
9/20/2005	NA	0.00	0.0	0.0	20.8	0.0	NM

MAINTENANCE FACILITY AREA

DATE	FLOW[a] (sfm)	PRESSURE (in H_2O)	CONCENTRATION (%V) Carbon Dioxide	Methane	Oxygen	CONCENTRATION (ppmv) PID	FID
BV-12							
9/11/2002	NA	NM	NM	NM	NM	NM	NM
12/2/2002	NA	NM	NM	NM	NM	NM	NM
3/4/2003	NA	NA	NM	NM	NM	NM	NM
6/12/2003	NA	0.1	0	0.0	20.3	NA	NA
9/10/2003	NA	0	NM	NM	NM	NM	NM
12/11/2003	3	8.6	NM	NM	NM	NM	NM
9/8/2004	4	0.44	NM	NM	NM	NM	NM
9/26/2006	NA	0	0.4	0.0	19.7	0	NM
9/19/2007	3.4	3.5	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/15/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
BV-13							
9/11/2002	NA	NM	NM	NM	NM	NM	NM
12/2/2002	NA	NM	NM	NM	NM	NM	NM
3/4/2003	NA	30	NM	NM	NM	NM	NM
6/12/2003	NA	17.5	0	0.0	20.1	NA	NA
9/10/2003	NA	9	NM	NM	NM	NM	NM
12/11/2003	3.5	NM	NM	NM	NM	NM	NM
9/8/2004	5	13	NM	NM	NM	NM	NM
9/26/2006	NA	0	0.4	0.0	20.6	0	NM
9/19/2007	3.1	0	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/15/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
BV-14							
9/11/2002	NA	NM	NM	NM	NM	NM	NM
12/2/2002	NA	NM	NM	NM	NM	NM	NM
3/4/2003	NA	27	NM	NM	NM	NM	NM
6/12/2003	NA	18	0	0.0	20.1	NA	NA
9/10/2003	NA	9	NM	NM	NM	NM	NM
12/11/2003	5	NM	NM	NM	NM	NM	NM
9/8/2004	6	11	NM	NM	NM	NM	NM
9/26/2006	NA	0	1.5	0.1	17.7	0	NM
9/19/2007	3.2	6.8	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/15/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM
BV-15							
9/11/2002	NA	NM	NM	NM	NM	NM	NM
12/2/2002	NA	NM	NM	NM	NM	NM	NM
3/4/2003	NA	27	NM	NM	NM	NM	NM
6/12/2003	NA	NM	NM	NM	NM	NM	NM
9/10/2003	NA	20	NM	NM	NM	NM	NM
12/11/2003	3.5	2.2	NM	NM	NM	NM	NM
9/8/2004	4	NM	NM	NM	NM	NM	NM
9/26/2006	NA	0	0.9	0.0	18.6	0	NM
9/19/2007	4.0	1	NM	NM	NM	NM	NM
9/25/2008	NA	NM	NM	NM	NM	NM	NM
9/23/2009	NA	NM	NM	NM	NM	NM	NM
9/8/2010	NA	NM	NM	NM	NM	NM	NM
9/20/2011	NA	NM	NM	NM	NM	NM	NM
9/19/2012	NA	NM	NM	NM	NM	NM	NM
9/17/2013	NA	NM	NM	NM	NM	NM	NM
9/30/2014	NA	NM	NM	NM	NM	NM	NM
9/15/2015	NA	NM	NM	NM	NM	NM	NM
9/15/2016	NA	NM	NM	NM	NM	NM	NM
9/27/2017	NM	NM	NM	NM	NM	NM	NM
9/13/2018	NM	NM	NM	NM	NM	NM	NM
9/25/2019	NM	NM	NM	NM	NM	NM	NM
9/15/2020	NM	NM	NM	NM	NM	NM	NM

Notes:

[a]Minimum detection limit is 5 standard feet per minute

FID = Flame Ionization Detector

FO = Flame Ionization detector flamed out

in H_2O = inches of water column

NA = Not Available

ND = Not Detected

NM = Not Measured

%V = Percent by Volume

PID = Photoionization Detector

ppmv = parts per million by volume

sfm = standard feet per minute

WA=Well abandoned

Table A-5

INJECTION PIPING DATA (PRESSURE) OPERATIONAL SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA (pressure, psig)							
			AS-01	AS-02	AS-03	AS-04	AS-05	AS-06	AS-07	AS-08
10/22/1998	3:30 PM	BCO/GMH	7.0	7.0	7.5	closed[a]	closed[a]	closed[a]	closed[a]	6.5
10/29/1998	6:30 AM	GMH	7.0	6.5	6.0	closed[a]	closed[a]	closed[a]	closed[a]	5.5
10/30/1998	11:45 AM	GMH	6.5	6.5	7.0	6.5	7.0	closed[a]	7.0	6.0
11/13/1998	7:30 AM	GMH	6.2	7.0	5.5	6.0	6.0	closed[a]	6.5	5.0
12/4/1998	7:30 AM	GMH	10.0	10.0	10.0	9.5	9.5	closed[a]	10.0	10.0
12/4/1998	9:30 AM	GMH	9.5	9.5	9.25	9.5	9.5	closed[a]	9.5	9.5
1/22/1999	9:00 AM	GMH	10.5	10.5	10.5	closed[a]	10.25	closed[a]	10.5	10.0
3/4/1999	8:00 AM	BCO/GMH	12.5	12.25	9.25	11.0	11.4	closed[a]	13.0	12.75
5/17/1999	4:30 PM	GMH	10.5	10.25	8.25	9.5	9.5	closed[a]	10.75	9.5
9/27/1999	5:00 PM	GMH	8.25	8.5	6.75	7.0	7.75	closed[a]	8.75	9.5
12/2/1999	2:00 PM	GMH	11.25	11.0	9.5	10.5	10.75	closed[a]	11.0	11.0
1/19/2000	11:00 AM	GMH/GT	11.5/closed[a]	11.0	9.5	10.75	11.0	closed[a]	11.25	11.75
4/24/2000	3:30 PM	GT/BN	2.5/closed	10.0	8.5	9.75	9.8	closed[a]	11.25	10.25
9/14/2000	3:30 PM	TM/BN	2.5/closed	10.0	8.75	9.25	9.75	closed[a]	11.25	10.50
12/20/2000	3:30 PM	TM/BN	2.5/closed	10.0	8.50	9.25	10.50	closed[a]	10.25	10.75
4/6/2001	10:30 AM	TM/BN	3.6	9.75	7.5	9.2	9.5	2.5	10.2	10.0
8/21/2001	10:30 AM	JR/BN	9.5/closed	8.75	7.5	8.25	8.3	closed[a]	9.25	7.5
2/6/2002	system off	TM/BN	system off	system off	system off	system off	system off	system off	system off	system off
6/19/2002	system off	PK	system off	system off	system off	system off	system off	system off	system off	system off
9/11/2002	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
12/2/2002	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
3/4/2003	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
6/12/2003	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
7/10/2003	system off	PK	system off	system off	system off	system off	system off	system off	system off	system off
8/27/2004	system off	AZ	system off	system off	system off	system off	system off	system off	system off	system off
9/10/2003	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
11/12/2003	system off	AZ	system off	system off	system off	system off	system off	system off	system off	system off
12/11/2003	system off	AZ/BAM	system off	system off	system off	system off	system off	system off	system off	system off
12/13/2004	system off	AZ/PEK	system off	system off	system off	system off	system off	system off	system off	system off

Table A-5

INJECTION PIPING DATA (PRESSURE) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA (pressure, manifold PSIG / wellfield)							
			AS-09 sys/well	AS-10 sys/well	AS-11 sys/well	BV-12 sys/well	BV-13 sys/well	BV-14 sys/well	BV-15 sys/well	BV-16 sys/well
6/19/2002	9:00 AM	PK/BM	7.0 / 6.0	7.3 / 1.5	7.0 / 6.0	1.5	0.6	0.6	1.9	1.4
6/19/2002	4:00 PM	PK	7.5 / 6.7	8.0 / 2.0	7.0 / 6.1	1.5 / <2"	0.6 / <2	0.9 / <2"	1.9 / <2"	1.4 / 54"
6/19/2002	6:30 PM	PK	6.2	6.9	7.0 / 6.2	1.5	0.6	0.9	1.5	0.7
6/20/2002	9:00 AM	PK	6.5 / 5.5	6.9 / 2.7	7.0 / 6.3	1.5 / 1.5"	0.6 / 1.0"	0.9 / 2.0"	1.2 / 2.0"	0.7 / 39.5"
6/20/2002	5:15 PM	PK	6.8 / 5.9	7.9 / 3.1	7.0 / 6.4	1.5 / 1.5"	0.6 / 1.1"	0.8 / 1.9"	1.1 / 2.0"	0.7 / 38.5"
9/11/2002	3:30 PM	PK	5.7 / 5.0	6.2 / 2.0	7.0 / 6.5	1.4 / <3"	0.6 / 1.2"	0.4/8.5"	<0.3/11"	<0.3/16"
12/2/2002	11:30 AM	PK/AZ	6.3	6.8	7.0 / 6.6	1.6	0.6 / 1.3"	0.5	<0.5	<0.5
3/4/2003	NA	PK/AZ	6.0/5	7.0	7.0 / 6.6	1.5	0.6 / 1.4"	0	0.5	NA
3/27/2003	NA	PK/AZ	8.0	8.0	7.0 / 6.6	off	0.6 / 1.5"	1.5	2.0	2.0
6/12/2003	11:45 AM	PK/AZ	8.0/7.0	7.8/7.5	7.0 / 6.6	1.4/0.1"	0.6 / 1.6"	0.6/18"	<0.3/NA	1.7/2.5"
7/10/2003	12:40 PM	PK	7.5 / 6.2	7.3 / 6.0	7.0 / 6.6	1.4 / 0.2"	0.6 / 1.7"	0.4 / 11.0"	<0.2 / 20.0"	1.6 / 2.1"
8/27/2004	8:45 AM	AZ	OFF	7.5 / 6.0	7.0 / 6.6	1.6 / 0.29"	0.6 / 1.8"	0.3 / 1.0"	0.3 / 20"	1.5 / 2.0"
9/10/2003	9:30 AM	PK/AZ	0.0 / 3.9	7.4 / 5.8	7.0 / 6.6	1.6 / 0.0"	0.6 / 1.9"	0.3 / 9.0"	<0.3 / 20.0"	1.4 / 2.0"
10/14/2003	10:00 AM	AZ	OFF	8.2 / 7.0	7.0 / 6.6	1.6 / 0.2"	0.6 / 1.10"	1.0 / 6.0"	0.2 / 18.0"	1.5 / 2.0"
11/12/2003	11:00 AM	AZ	8.0 / 6.9	8.0 / 6.5	7.0 / 6.6	1.6 / 0.3"	0.6 / 1.11"	1.2 / 3.5"	0.3 / 15.0"	1.5 / 2.2"
12/11/2003	11:00 AM	AZ/BAM	6.0 / 5.5	7.0 / 4.6	7.0 / 6.6	2.0 / 8.6 "	0.6 / 1.12"	1.5 / NA	NA / 2.2"	NA / 1.8"
1/15/2004	11:00 AM	PK	7.3 / 6.59	7.7 / 6.4	7.0 / 6.6	1.6 / 0.88"	0.6 / 1.13"	0.9 / NA	<0.4 / 0.9	0.5 / 2.10"
2/10/2004	2:00 PM	AZ	7.5 / 6.0	7.5 / 5.8	7.0 / 6.6	1.5 / 0.1"	0.6 / 1.14"	1.0 / 0.8"	<0.3 / 8"	0.5 / 2.10"
3/10/2004	11:15 AM	PK/AZ	7.5 / 4.5 (off)	7.5 / NA (off)	7.0 / 6.6	1.6 / NM	0.6 / 1.15"	0.8 / NM	<0.3 / NM	0.7 / 1.5"
4/26/2004	1:00 PM	PK	7.9 / 6.9	7.7 / 6.0	7.0 / 6.6	0.36 / 1.6"	0.6 / 1.16"	0.5 / 12"	0.5 / 0.0"	0.5 / 1.5"
5/11/2004	8:00 AM	AZ	7 / 5.5	7 / 4.5	7.0 / 6.6	1.5 / 0.2"	0.6 / 1.17"	0.5 / 8"	0 / 0"	0 / 1.0"
6/22/2004	930 AM	AZ	7/5.5	7/NA	7.0 / 6.6	1.5/1.0"	0.6 / 1.18"	0.5/10"	NA/1.2"	NA/1.5"
7/14/2004	1100 AM	AZ	6/5.0	7/4.5	7.0 / 6.6	1.5/1.0"	0.6 / 1.19"	0.5/10"	NA/1.4"	NA/1.2"
8/10/2004	11:00 AM	AZ	6 / 4.0	7/3.5	7.0 / 6.6	1.5 / 1"	0.6 / 1.20"	0.5 / 9"	NA/ NA	NA/ 1.5"
9/8/2004	12:00 PM	PK/AZ	6 / 3.7	7 / 4.0	7.0 / 6.6	1.5 / 0.5"	0.6 / 1.21"	0.5 / 11"	NA / NA	NA / 36"
10/12/2004	11:00 AM	AZ	6 / 4.0	7 / 4.0	7.0 / 6.6	1.0 / 1.0"	0.6 / 1.22"	0.5 / 11"	NA / NA	NA / 2"
11/19/2004	11:00 AM	AZ	7.5 / 6	7.0 / 4.0	7.0 / 6.6	1.5 / 0.5"	0.6 / 1.23"	0.5 / 10"	NA / NA	NA / 1.2"
12/13/2004	11:00 AM	AZ/PK	8.0 / 7.0	7.0 / 6.0	7.0 / 6.6	2.5 / 6.2"	0.6 / 1.24"	0.75 / 14"	0 / 1.8"	0 / 40"
1/20/2005	11:00 AM	AZ	8.0 / 7.0	7.0 / 6.0	8.0 / 7.0	1.75 / 5.1"	1.0 / 1.6"	1.0 / 17"	0 / 1.7"	0 / 1.8"
2/18/2005	11:00 AM	AZ	8.0 / 7.0	7.0 / 6.0	8.0 / 7.0	1.75 / 5.1"	1.0 / 1.6"	1.0 / 17"	0 / 1.7"	0 / 1.8"
3/15/2005	11:00 AM	AZ/PK	7.8/6.0	7.0/6.2	8.1/6.9"	1.6/0.26"	0.6/1.5"	0.4 / 9.8"	0.5 / 0.6"	<0.5 / 3"
4/6/2005	8:00 AM	AZ	8.0 / 6.5	7.5 / 6.5	8.5 / 7.0	1.5 / 6.5"	1.0 / 1.5"	0.75 / 15"	0.0 / 1.0"	0 / 2.0"
5/11/2005	10:00 AM	AZ/BL	8.5 / 8.8	7.5 / 7.6	9.0 / 8.4	1.5 / 6.7"	1.0 / NM	1.0 / 27"	0 / 8.2"	0 / 3.7
6/21/2005	10:00 AM	BL	8.0 / 6.4	7.5 / 6.0	8.5 / 6.8	1.5 / 1.0"	0.5 / 18.0"	0.75 / 19.0"	0 / 1.8"	NM / 1.6 psi
7/13/2005	10:00 AM	AZ/DV	8.0 / 6.3	7.0 / 5.3	8.5 / 7.2	1.5 / 0.6"	0.3 / 29"	1.0 / 16"	0.1 / 1.0"	<0.1 / 1.6"
8/12/2005	10:00 AM	DV	9.0 / 6.4	7.5 / 6.2	9.0 / 7.0	1.5 / 0.8	0.5 / 2.8	0.5 / 16	<.1 / 1.3	<0.1 / 3.9
9/20/2005	10:00 AM	DV	8.0 /	7.0 /	9.0 /	11.0 /	0.0 /	12.0 /	11.5 /	0
10/10/2005	11:00 AM	DV	7.0/	7.0/	8.0/	1.8/	<0.1/	1.0/	<0.1/	<0.1/
11/16/2005*	10:00 AM	DC	NA	NA	NA	NA	NA	NA	NA	NA
12/7/2005	10:00 AM	DC	NA	0.5	NA	1.5/	0.5/	1.5/	0.5/	NA

Table A-5

INJECTION PIPING DATA (PRESSURE) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA (pressure, manifold PSIG / wellfield)							
			AS-09 sys/well	AS-10 sys/well	AS-11 sys/well	BV-12 sys/well	BV-13 sys/well	BV-14 sys/well	BV-15 sys/well	BV-16 sys/well
1/4/2006	10:00 AM	DC	12/	10/	12/	1.5/	0/	0.5/	0/	
2/6/2006	11:00 AM	DC	12.5/	10/	12.5/	2/	0.5/	1.5/	0/	
3/13/2006	11:00 AM	DC	12.5/	10/	12.5/	2/8"	0.5/1"	0.5/28"	2.5/50"	/1.5
4/5/2006	10:00 AM	DC	12/	10/	12/	1.5/	0.0/	0.5/19	0.0/	
5/16/2006	11:00 AM	DC	12/	10/	12/	1.5/	0.0/	0.5/19	0.0/	
6/13/2006	12:50 PM	DC	12/	10.5/	12/	1.5/	0/	1/	1.5/	
7/17/2006	11:00 AM	DC	12.0/9.0	10.0/7.5	12.0/10.0	1.5/0.5	0/	0/10	0/	/2.0
8/2/2006	11:00 AM	DC	12/8.5	10.0/7.0	12.0/10.0	1.5/1	0/	0/6	0/	1.0/40.0
9/26/2006*	10:00AM	TM/JL	NA	NA	NA	NA	NA	NA	NA	NA
10/27/2006	2:00 PM	PK	11.5/11.5	9.2/7.6	11.5/9.6	1.6/1	<0.5/<0.5	<0.5/4.5	<0.5/1.8	0.4/1.4 psi
11/28/2006	11:10 AM	TM	12.5/11	11.0/8.0	13/NA	1.75/6.8	0/0	1.25/29	0/3	0/42
12/28/2006	11:05 AM	TM	12.5/10	11.0/8.0	12.5/11	1.75/5	0/0	1.0/20.0	0/2.0	0/42
1/31/2007	9:22 AM	TM	13/10	11/10	12.5/10	1.5/1.2	0/0.1	1/16	0/2.5	0/42
2/28/2007	8:25 AM	TM	12.5/10	11/	12.5/12	2/9	0/0.2	1.25/25	0/3.2	0/3
3/7/2007	8:15 AM	TM	12.5/11	11/10	12/11	1.5/6	0/0.2	1.25/23	0/3	1/45
4/17/2007	10:00	TM	12.5/10	11/4	12/11	1.5/4.5	0/	1.25/20	0/2.9	0/40
5/25/2007	9:30 AM	TM	11/0	0/0	0/0	1.5/10	0/0	0/15	0/2	0/40
6/8/2007	9:30 AM	TM	11/0	0/0	0/0	1.5/10	0/0	0/15	0/2	0/35
7/24/2007	12:55 PM	DL	14/12	12/10	13/10	1.5/1	0/0	0/>10	0/2	0/35 psi
8/23/2007	1:00 PM	DL	14/12.5	12/13	13/14	1/0.5	0/9	0/0	0/1	0/38 psi
9/19/2007	3:00 PM	PK	14.5	13.5	14.3	1.6	<0.3	0.4	<0.3	0.3
10/18/2007	12:45 PM	DC	14.5/14	14/13	14/NA	1.5/6	0/0	0.4/10	0/1	0.4/30
11/29/2007	1:00 PM	DL	13/12	12/12	13/13	0	0	0	0	0
12/19/2007	4:00 PM	DW	13/12	11/NA	11/NA	system off	system off	system off	system off	system off
1/31/2008	1:30 PM	PK	9.8/8.0	9.5/7.8	9.5/7.2	system off	system off	system off	system off	0.0/0.0
2/29/2008	11:00 AM	JM	9/8.1	9/6.8	9.5/7.5	system off	system off	system off	system off	system off
3/26/2008	10.30 AM	DW	15/13	15/15	15/13	system off	system off	system off	system off	system off
4/17/2008	10:40 AM	JM	14/6.4	14/6.2	14/6.6	system off	system off	system off	system off	system off
5/20/2008	10:00 AM	JM	10/8.4	10/8.5	10/8.4	system off	system off	system off	system off	system off
6/30/2008	12:50 PM	PK	3/NM	3/NM	3/NM	system off	system off	system off	system off	system off
7/15/2008	9:00 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off
8/26/2008	11:15 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off
9/25/2008	2:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
10/15/2008	9:30 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off
11/7/2008	10:15 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off
12/16/2008	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off

Table A-5

INJECTION PIPING DATA (PRESSURE) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA (pressure, manifold PSIG / wellfield)							
			AS-09 sys/well	AS-10 sys/well	AS-11 sys/well	BV-12 sys/well	BV-13 sys/well	BV-14 sys/well	BV-15 sys/well	BV-16 sys/well
1/21/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
3/18/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
4/29/2009	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off
5/27/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
6/12/2009	2:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
8/31/2009	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
9/23/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
10/20/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
11/20/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
12/5/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
1/20/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
2/26/2010	10:00 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off
3/16/2010	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
4/29/2010	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
5/28/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
7/29/2010	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off
8/31/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
9/9/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
10/12/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
11/29/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
12/22/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
1/21/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
2/23/2011	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off
3/9/2011	12:00 PM	JM & IV	system off	system off	system off	system off	system off	system off	system off	system off
4/14/2011	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
5/16/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
6/7/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
7/19/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
8/23/2011	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off
9/20/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
10/28/2011	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
12/2/2011	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off

Table A-5

INJECTION PIPING DATA (PRESSURE) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA (pressure, manifold PSIG / wellfield)							
			AS-09 sys/well	AS-10 sys/well	AS-11 sys/well	BV-12 sys/well	BV-13 sys/well	BV-14 sys/well	BV-15 sys/well	BV-16 sys/well
2/1/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off
2/16/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
3/14/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
4/26/2012	08:00 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off
5/15/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
6/27/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off
7/20/2012	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
8/10/2012	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off
9/19/2012	11:15 AM	DL & EL	system off	system off	system off	system off	system off	system off	system off	system off
11/13/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
12/27/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off
9/17/2013	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off
9/30/2014	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off
9/15/2015	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off
9/15/2016	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off
9/27/2017	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off
9/13/2018	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off
9/25/2019	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off
9/14/2020	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off

Notes:

" = inches of water column
* = System Problem, Unit turned off
NA = Not Available
NM = Not Measured

psig = pounds per square inch gauge
Sys = Reading collected at system shed
Well = Reading collected from well head

Table A-6

INJECTION PIPING DATA (FLOW) OPERATIONAL SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA[a] (flow, standard feet per minute)							
			AS-01	AS-02	AS-03	AS-04	AS-05	AS-06	AS-07	AS-08
10/22/1998	3:30PM	BCO/GMH	135	650	1040	closed[b]	closed[b]	closed[b]	closed[b]	950
10/29/1998	6:30 AM	GMH	100	510	465	closed[b]	closed[b]	closed[b]	closed[b]	320
10/30/1998	11:45 AM	GMH	78	311	375	480	180	closed[b]	220	430
12/4/1998	7:30 AM	GMH	20	15	68	245	16	closed[b]	0	0
12/4/1998	9:30 AM	GMH	25	36	75	100	22	closed[b]	0	18
12/16/1998	2:00 PM	BCO/GMH	120	200	210	closed[b]	NM	closed[b]	NM	450
3/3/1999	10:30 AM	BCO/GMH	100	600	187	96	130	closed[b]	0	240
5/18/1999	3:00 PM	GMH	0	1010	229	105	91	closed[b]	318	173
5/18/1999	4:15 PM	GMH	136	395	290	48	215	closed[b]	245	21
9/27/1999	5:00 PM	GMH	30	195	170	0	155	closed[b]	330	410
9/30/1999	11:35 AM	BCO	53	99	118	132	435	closed[b]	92	97
12/2/1999	2:00PM	GMH	10	35	71	420	320	closed[b]	117	305
4/24/2000	4:00 PM	GT/BN	0/closed	67	265	435	270	closed[b]	101	240
9/14/2000	3:30 PM	TM/BN	0/closed	NM	NM	NM	NM	closed[b]	NM	NM
12/21/2000	12:30 PM	GT/BN	0/closed	NM	NM	NM	NM	closed[b]	NM	NM
4/6/2001	11:56 AM	TM/BN	closed	104	44	0	1	closed[b]	NM[c]	98
8/20/2001	12:00 PM	JR/BN	0/closed	NM	0	107	0	closed[b]	164	NM
2/6/2002	system off	TM/BN	system off	system off	system off	system off	system off	system off	system off	system off
6/19/2002	system off	PK	system off	system off	system off	system off	system off	system off	system off	system off
9/11/2002	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
12/2/2002	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
3/4/2003	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
6/12/2003	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
7/10/2003	system off	PK	system off	system off	system off	system off	system off	system off	system off	system off
8/27/2004	system off	AZ	system off	system off	system off	system off	system off	system off	system off	system off
9/10/2003	system off	PK/AZ	system off	system off	system off	system off	system off	system off	system off	system off
10/14/2003	system off	AZ	system off	system off	system off	system off	system off	system off	system off	system off
11/12/2003	system off	AZ	system off	system off	system off	system off	system off	system off	system off	system off
12/11/2003	system off	AZ/BAM	system off	system off	system off	system off	system off	system off	system off	system off
1/15/2004	system off	PK	system off	system off	system off	system off	system off	system off	system off	system off
2/10/2004	system off	AZ	system off	system off	system off	system off	system off	system off	system off	system off
12/13/2004	system off	AZ/PK	system off	system off	system off	system off	system off	system off	system off	system off

Table A-6

INJECTION PIPING DATA (FLOW) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA[a] (flow, standard feet per minute)								(in H2O) / (C) / psig
			AS-09	AS-10	AS-11	BV-12	BV-13	BV-14	BV-15	BV-16	BV-16
6/19/2002	9:00 AM	PK/BM	11.5	11.0	8.0	5.0	5.0	4.5	5.0	<100	NA / 36 / NA
6/19/2002	6:30 PM	PK	3.0	3.0	3.0	5.0	5.0	5.0	3-4	<100	NA
6/20/2002	7:30 AM	PK	3.1	3.1	3.2	4.8	5.1	5.1	3.7	<100	NA
6/20/2002	5:15 PM	PK	3.5	14.5	8.5	5.0	5.0	4.8	4.0	100.0	NA
9/11/2002	3:30 PM	PK	5.5	6.5	9.5	5.0	5.5	5.0	6.0	30.0	1.2/51/<0.3
12/2/2002	6:30 AM	PK/AZ	14.5	14.0	8.0	8.0	2.5	3.0	4.5	100.0	1.05/48/<0.5
3/4/2003	NA	PK/AZ	8.0	5.5	3.0	10.0	7.0	5.0	5.0	100.0	2 / 70 / NA
3/27/2003	NA	PK/AZ	13.0	13.0	13.0	off	4.0	4.0	4.0	70.0	2.7 / 18 / 2.0
6/12/2003	11:45 AM	PK/AZ	12.5	16.0	10.0	3.0	4.7	4.0	2.5	90.0	1.4 / 73 / 1.7
7/10/2003	12:40 PM	PK	13.0	18.0	11.0	2.8	4.7	4.0	2.5	50.0	0.98 / 76 / 1.6
8/27/2004	8:45 AM	AZ	OFF	20.0	10.0	3.5	4.2	4.0	3.9	50.0	1.4 / 71 / 1.5
9/10/2003	9:30 AM	PK/AZ	0.0	20.0	10.0	3.5	4.0	4.0	3.9	50.0	1.5 / 72 / 1.4
10/14/2003	10:00 AM	AZ	OFF	15.0	10.0	3.4	4.5	4.0	2.0	60.0	1.3 /M 74 / 1.5
11/12/2003	11:00 AM	AZ	14.0	14.0	11.5	3.2	4.6	4.0	2.8	65.0	1.6 / 76 / 1.5
12/11/2003	11:00 AM	AZ/BAM	8.0	4.0	NA	3.0	3.5	3.5	3.5	70.0	1.2 / 68 / NA
1/15/2004	11:00 AM	PK	10 (9-11)	14 (13.5-14.5)	6.5 (5.5-7.5)	2.6	6.3	4.0	3.5	40.0	1.1 / 68 / 0.5
2/10/2004	2:00 PM	AZ	10.0	14.0	5.0	4.0	3.0	4.0	3.5	95.0	1.15 / 77 / 0
3/10/2004	11:15 AM	PK/AZ	9.5	16.0	7.5	3.9	3.7	4.5	3.8	40.0	1.22 / 77 / 0.7
4/26/2004	1:00 PM	PK	11.0	19.0	10.5	3.4	3.0	3.8	6.3	30.0	1.0 / 74 / 0.5
5/11/2004	8:00 AM	AZ	6.0	14.0	10.0	3.5	5.0	5.0	4.0	70.0	1.0 / 64 / 0
6/22/2004	9:00 AM	AZ	6.0	14.0	9.0	4.0	5.0	5.0	4.0	80.0	1.0 / 64 / 0
7/14/2004	11:00 AM	AZ	6.0	14.0	6.0	4.0	5.0	4.5	4.0	90.0	1.0 / 44 / 0
8/10/2004	11:00 AM	AZ	6.0	14.0	8.0	4.0	5.0	5.0	4.0	90.0	1.0 / 60 / 0
9/8/2004	11:00 AM	PK/AZ	7.0	13+	9.0	4.0	5.0	6.0	4.0	96.0	NA
10/12/2004	11:00 AM	AZ	7.0	13.0	8.0	4.0	3.0	3.5	4.0	100.0	1.0 / 65 / 0
11/19/2004	11:00 AM	AZ	0-8	0-10	0-9	4.0	4.0	4.0	4.0	90.0	1.2 / 70 / 0
12/13/2004	11:00 AM	AZ/PK	11.0	10.0	10.0	3.5	4.0	4.0	4.5	90.0	1.1 / 80 / 0
1/20/2005	11:00 AM	AZ	10.0	10.5	10.0	3.5	4.0	3.5	5.0	84.0	1.0 / 76 / 0
2/18/2005	9:30 AM	AZ	10.0	10.5	10.0	3.5	4.0	3.5	5.0	84.0	1.0 / 76 / 0
3/15/2005	11:00 AM	AZ/PK	9.5	11.5	11.0	3.5	4.9	4.2	4.0	80.0	0.88 / 76 / 0
4/6/2005	8:00 AM	AZ	10.0	11.5	9.5	3.5	4.0	4.0	4.0	90.0	1.0 / 74 / 0
5/11/2005	10:00 AM	AZ/BL	8.0	11.0	10.0	3.5	4.5	3.5	4.0	100.0	1.1 / 74 / 0
6/21/2005	10:00 AM	BL	8.0	10.0	11.5	4.0	5.5	4.0	4.0	100.0	1.0 / 76 / 0
7/13/2005	10:00 AM	AZ/DV	9.0	11.0	10.0	3.9	5.5	4.5	4.2	95.0	1.1 / 80 / 0
8/12/2005	10:00 AM	DV	7.0	13.0	10.0	4.0	5.0	4.5	4.5	60.0	0 / 60 / <1
9/20/2005	10:00 AM	DV	9.0	12.0	10.0	4.5	7.0	5.5	4.5	90.0	0 / 69 / 0
10/10/2005	11:00AM	DV	7.0	10.0	8.5	4.0	7.0	4.0	4.5	35.0	0/70.5/0
11/16/2005	10:00 AM	DC	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/2005	10:00AM	DC	NA	NA	NA	4.0	7.0	4.0	4.0	50.0	1.3

Table A-6

INJECTION PIPING DATA (FLOW) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA[a] (flow, standard feet per minute)								(in H2O) / (C) / psig
			AS-09	AS-10	AS-11	BV-12	BV-13	BV-14	BV-15	BV-16	BV-16
1/4/2006	10:00AM	DC	6.0	15.0	13.5	4.0	6.0	4.0	4.0	35.0	0/70/0
2/6/2006	11:00AM	DC	6.5	15.0	15.0	4.0	7.0	4.0	4.0	30.0	0/66/0
3/13/2006	11:00AM	DC	5.5	17.5	14.5	5.5	10.0	6.5	3.5	30.0	0/22/
4/5/2006	10:00 AM	DC	5.0	16.0	16.5	4.5	7.0	4.5	4.0	30.0	1.4/76/0
5/16/2006	11:00 AM	DC	4.0	16.0	17.0	5.0	8.0	5.0	6.5	40.0	1.3/84/1
6/13/2006	12:50 PM	DC	4.0	15.0	16.5	6.0	9.0	6.0	5.0	50.0	2/76/
7/17/2006	11:00 AM	DC	4.0	17.0	17.0	5.0	7.5	6.0	7.0	30.0	1.35/80/0
8/2/2006	11:00 AM	DC	5.0	16.0	18.0	5.0	7.0	5.0	7.0	50.0	1.3/86/0
9/26/2006*	10:00 AM	TM/JL	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/27/2006	2:00 PM	PK	3.5	17.0	14.5	3.5	3.5	3.5	4.0	90.0	1.35/78/
11/28/2006	11:25 AM	TM	4.0	14.0	9.0	3.5	3.5	2.0	4.5	70.0	1.5/68/
12/28/2006	11:05 AM	TM	3.0	13.0	11.0	3.5	3.5	3.0	4.5	70.0	1.5/68/
1/31/2007	9:22 AM	TM	2.5	13.0	8.8	3.8	3.0	3.0	4.3	70.0	1.4/68/0
2/28/2007	8:25 AM	TM	2.5	12.0	7.5	3.2	3.0	2.5	4.2	70.0	0.4/69/0
3/7/2007	8:15 AM	TM	2.5	11.5	11.0	3.5	3.0	2.5	4.5	70.0	1.25/79/1
4/17/2007	10:00	TM	3.0	11.5	10.0	3.5	3.2	2.5	4.0	70.0	1.3/75/0
5/25/2007	9:30	TM	0.0	0.0	0.0	3.5	0.0	0.0	4.0	0.0	1.25/72/0
6/8/2007	9:30	TM	0.0	0.0	0.0	3.5	0.0	0.0	4.0	70.0	1.4/72/0
7/24/2007	12:55 PM	DL	5.0	15.0	19.0	5.0	5.0	5.0	6.0	70.0	1.2/82/0
8/23/2007	1:00 PM	DL	0.5	9.5	15.0	3.0	3.0	3.0	4.0	87.0	1.1/87/0
9/19/2007	3:00 PM	PK	3.0	10.0	11.3	3.4	3.1	3.2	4.0	70.0	1.2 / 84 / 0.3
10/18/2007	12:45 PM	DC	0.5	9.0	12.0	4.0	4.0	4.0	5.0	60.0	1.0/80/0.4
11/29/2007	1:00 PM	DL	5	6.0	7.5	0	0	0	0	0	0
12/19/2007	4:00 PM	DW	4.0	7.0	8.0	system off	system off	system off	system off	system off	system off
1/31/2008	1:30 PM	PK	2.5	3.0	2.5	system off	system off	system off	system off	system off	system off
2/29/2008	11:00 AM	JM	0-5	0-10	0-15	system off	system off	system off	system off	system off	0.1/20/50
3/26/2008	10:30 AM	DW	2-5	5-10	5-15	system off	system off	system off	system off	system off	system off
4/17/2008	10:40 AM	JM	2-5	5-10	10-15	system off	system off	system off	system off	system off	system off
5/20/2008	10:00 AM	JM	0	0	0	system off	system off	system off	system off	system off	system off
6/30/2008	12:50 PM	PK	0	0	0	system off	system off	system off	system off	system off	system off
7/15/2008	9:00 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/26/2008	11:15 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/25/2008	2:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/15/2008	9:30 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/7/2008	10:15 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/16/2008	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
1/21/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/18/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/29/2009	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/27/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
6/12/2009	2:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/31/2009	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/23/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/20/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/20/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/5/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off

Table A-6

INJECTION PIPING DATA (FLOW) OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	INJECTION PIPING DATA[a] (flow, standard feet per minute)								(in H2O) / (C) / psig
			AS-09	AS-10	AS-11	BV-12	BV-13	BV-14	BV-15	BV-16	BV-16
1/20/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/26/2010	10:00 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/16/2010	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/29/2010	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/28/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
7/29/2010	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/31/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/9/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/12/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/29/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/22/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
1/21/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/23/2011	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/9/2011	12:00 PM	JM & IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/14/2011	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/16/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
6/7/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
7/19/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/23/2011	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/20/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/28/2011	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/2/2011	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/1/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/16/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/14/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/26/2012	08:00 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/15/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
6/27/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off
7/20/2012	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/10/2012	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/19/2012	11:15 AM	DL & EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/13/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/27/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/17/2013	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/30/2014	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/15/2015	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/15/2016	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/27/2017	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/13/2018	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/25/2019	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/14/2020	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off

Notes:

[a]Minimum detection limit is 5 standard feet per minute

[b]Valve closed per PCMP

[c]Unable to remove plug; Damage to pipe.

* - System Problem, Unit turned off

NA = Not Available

NM = Not Measured

Table A-7

BIOSPARGING COMPRESSOR SYSTEM OPERATIONAL SUMMARY

TREATED WOOD PRODUCTS AREA

DATE	TIME	OPERATOR INITIALS	HOUR METER (hour)	BLOWER (B-100) DATA			HEAT EXCHANGER DISCHARGE DATA			
				INFLUENT	DISCHARGE		BEFORE BYPASS		AFTER BYPASS	
				PI-101 (in H_2O)	PI-100 (psig)	TI-100 (^oF)	PI-102 (psig)	TI-101 (^oF)	PI-102 (psig)	FI-100 (scfm)
10/21/1998	4:02 PM	BCO/GMH	NM	6	6.00[a]	170	9.00	70	8.00	30
10/29/1998	6:00 AM	GMH	NM	NM	6.25[a]	140	9.00	60	7.25	31
10/30/1998	12:15 PM	GMH	187.8	NM	6.00[a]	150	9.00	60	7.25	27
11/13/1998	9:30 AM	BCO/GMH	NM	NM	6.60[a]	140	9.00	60	7.25	27
12/4/1998	7:00 AM	GMH	1021.6	NM	8.40[a]	130	11.00	50	10.50	28
12/4/1998	10:15 AM	GMH	1024.8	NM	6.50[a]	130	11.25	50	10.50	22
12/16/1998	2:45 PM	BCO/GMH	1316.0	-8.5	9.50[a]	140	12.50	50	11.00	36
1/22/1999	8:35 AM	GMH	2198.7	-8.5	9.50[a]	145	12.50	50	11.50	35
3/2/1999	8:50 AM	GMH	3135.0	-85	10.0[a]	140	12.50	<50	11.75	34
3/3/1999	2:15 PM	BCO/GMH	3164.4	-85	10.5[a]	150	13.25	55	12.00	34
4/30/1999	4:06 PM	GMH	4122.8	-90	10.0[a]	147	11.50	60	10.25	34
5/19/1999	11:50 AM	GMH	4618.6	-85	11.0[a]/13.5[b]	170	13.50	60	12.75	34
5/27/1999	3:00 PM	GMH	4744.1	-85	10.0[a]	195	13.00	80	12.00	30
6/25/1999	2:00 PM	GMH	5231.1	-85	11.0[a]	185	13.00	75	12.50	30
7/22/1999	1:00 PM	GMH	5490.7	-85	9.0[a]	210	11.50	85	11.50	30
8/3/1999	1:00 PM	GMH	5740.7	-85	6.0[a]	175	7.50	85	7.50	32
9/29/1999	10:00 AM	GMH	7107.3	-80	7.0[a]	160	8.50	60	8.00	36
9/30/1999	12:52 PM	BCO	7109.5	-80	7.5[a]	160	8.00	60	7.50	37
12/2/1999	10:00 AM	GMH	8618.9	-85	8.5[a]	155	10.00	60	10.00	37
4/24/2000	5:00 PM	GLT/BN	12080.9	-85	8.0[a]	175	8.25	80	8.00	36
9/14/2000	2:00 PM	TM/BN	15508.8	NM	7.75	125	9.75	245	7.50	34
12/20/2000	2:00 PM	TM/BN	17488.0	-90	17	70	20.00	220	17.00	>45
4/6/2001	10:35 AM	TM/BN	20028.6	110	14.5	180	15	75	13.5	>45
5/17/2001	10:55 AM	TM/PK	21013.0	-110	16.5	185	17.5	70	16.5	>45
8/20/2001	3:55 PM	JR/BN	22551.9	<-100	15	210	14.5	90	13.5	>45
2/6/2002	system off	TM/BN	23471.8	system off	system off	system off	system off	system off	system off	system off
6/19/2002	system off	PK	NM	system off	system off	system off	system off	system off	system off	system off
9/11/2002	system off	PK	NM	system off	system off	system off	system off	system off	system off	system off
12/2/2002	system off	PK/AZ	NM	system off	system off	system off	system off	system off	system off	system off
3/4/2003	system off	PK/AZ	NM	system off	system off	system off	system off	system off	system off	system off
6/12/2003	system off	PK/AZ	NM	system off	system off	system off	system off	system off	system off	system off
7/10/2003	system off	PK	NM	system off	system off	system off	system off	system off	system off	system off
8/27/2004	system off	AZ	NM	system off	system off	system off	system off	system off	system off	system off
9/10/2003	system off	PK/AZ	NM	system off	system off	system off	system off	system off	system off	system off
10/14/2003	system off	AZ	NM	system off	system off	system off	system off	system off	system off	system off
11/12/2003	system off	AZ	NM	system off	system off	system off	system off	system off	system off	system off
12/11/2003	system off	AZ/BAM	NM	system off	system off	system off	system off	system off	system off	system off

Table A-7

BIOSPARGING COMPRESSOR SYSTEM OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA

DATE	TIME	OPERATOR INITIALS	SVE HOUR METER (hour)	AS HOUR METER (hour)	GAST COMPRESSOR DATA				ROTRON BLOWER DATA			
					INFLUENT		DISCHARGE		INFLUENT		EFFLUENT	
					V-1 / V-2 (in H_2O)	T-1 / T-2 (°F)	P-1/P-2 (psig)	T-3 / F-1 (°F) / (in H2O)	V-3 / V-4 (in H2O)	T-4/T-5/T-6 (°F/C/C)	P-3 (psig)	F-2 (scfm)
6/19/2002	10:30	PK/BM	9.1	3.6	5 / 5	74 / 74	8.5 / 6.5	76 / 1.0	22 / 22	67 / 68 / 65	2.1	145
6/19/2002	13:30	PK	NM	NM	5 / 5	76 / 76	9 / 6	78 / 1.3	26 / 25	70 / 67 / 66	2.0	145
6/19/2002	18:20	PK	NM	NM	8.5 / 8.0	81 / 82	8.0 / 4.5?	87 / NM	27 / 26	80 / 66 / 66	1.4	160
6/20/2002	7:20	PK	30.4	23.9	13 / 9	77 / 76	8.0 / 5.0	88 / 0.2	27 / 26.5	72 / 63 / 62	1.3	155
6/20/2002	15:30	PK	34.7	28.1	14 / 8.5	96 / 95	9.0 / 5.5	94 / 1.0	26.5 / 26	90 / 71 / 71	1.4	160
9/11/2002	15:00	PK	1968.9	1962.3	1.5 / 3.0	95 / 94	8.0 / 8.0	94 / 0	59.0 / 57.5	90 / 84 / 82	0.5	140
12/2/2002	11:00	PK/AZ	3933.4	3926.8	NA / 6.5	67 / 65	8.9 / 10.25	87 / NA	63 / 59	67 / 86 / 83	0.75	125
3/4/2003	NA	PK/AZ	NM	NM	NA / 7	68 / 62	8.5 / 9	70 / NA	48 / 46	74 / 101 / 58	1.5	120
6/12/2003	10:45	PK/AZ	8498.3	8491.6	NA / 6.5	90 / 90	9.5 / 10.5	92 / NA	11 / 11	79 / 92 / 81	3.5	110
7/10/2003	12:40 PM	PK	9172.7	9166	NA / 6.0	95 / 93	9.5 / 10.0	94 / NA	11.5 / 11.5	89 / 96 / 86	3.6	80
8/27/2004	8:45	AZ	10324.0	10318	NA / 6.0	NA / 79	9.5 / 11.5	77 / NA	14.3 / 14.3	74 / 77 / 77	3.6	80
9/10/2003	9:30 AM	PK/AZ	10647.3	10537.3	NA / NA	82 / 84	9.0 / 10.5	82 / NA	15 / 15	77 / 86 / 76	3.5	80
10/14/2003	10:00 AM	AZ	11484.0	11354	NA / 6.0	78 / 80	9.5 / 10.5	76 / NA	12 / 12	86 / 76 / 78	3.3	85
11/12/2003	11:00 AM	AZ	12160.0	12050	NA / NA	68 / 68	NA / 10.0	64 / NA	11 / 11	62 / 76 / 88	2.5	110
12/11/2003	11:00 AM	AZ/BAM	12855.4	12745.5	NA /NA	68 / 68	NA / 10	64 / NA	40 / 40	62 / 92 / 88	2.5	110
1/15/2004	11:00 AM	PK	13695.4	13585.5	NA / 4?	71 / 73	15? / 10.3	74 / NA	44 / 43	66 / 96 / 75	2.4	70
2/10/2004	2:00 PM	AZ	14315.0	14205.1	NA / 6.0	75 / 80	NA / 10.0	78 / NA	46 / 44	75 / 105 / 88	2.5	110
3/10/2004	11:15 AM	PK/AZ	15011.0	14900.8	NA / NA	NA / 87	NA / 10.5	86 / NA	41 / 40	68 / 99 / 84	2.6	80
4/26/2004	1:00 PM	PK	15935.6	15804	NA / NA	107 / 107	6.9 / 9.0	106 / NA	47 / 46	94 / 104 / 97	2.1	90
5/11/2004	8:00 AM	AZ	16294.5	16162.9	NA / NA	84 / 84	8.5 / 7.5	84 / NA	52 / 46	76 / 86 / 88	2	110
6/22/2004	9:00 AM	AZ	17299.6	17168	NA / NA	80 / 80	10 / 8.0	80 / NA	48 / 47	77 / 96 / 88	3	112
7/14/2004	11:00 AM	AZ	17878.5	17696	NA / NA	120 / 120	11 / 7.5	84 / NA	50 / 52	92 / 68 / 70	3	128
8/10/2004	11:00 AM	AZ	18475.9	18344.3	NA / NA	80 / 82	10 / 7.5	88 / NA	50 / 48	84 / 98 / 90	3	112
9/8/2004	11:00 AM	PK/AZ	19173.2	19041.6	NA / NA	94 / 92	9 / 7.0	90 / NA	46 / 44	90 / 104 / 93	3	112
10/12/2004	11:00 AM	AZ	19938.9	1987.4	NA / NA	86/84	9 / 7.0	85 / NA	44 / 40	84 / 96 / 85	3.5	105
11/19/2004	11:00 AM	AZ	20851.8	20720.3	NA / NA	78/78	11 / 8.0	74 / NA	46 / 44	70 / 92 / 84	3	110
12/19/2004	11:00 AM	AZ/PK	21425.1	21293.6	NA / NA	96/88	10/8.5	92/ NA	44 / 43	85 / 104 / 95	3	105
1/20/2005	11:00 AM	AZ	22337.3	22205.8	NA / NA	84 / 78	11/8.5	82 / NA	46 / 45	78 / 102 / 92	3	112
2/15/2005	11:00 AM	AZ	22962.4	22830.9	NA / NA	84 / 78	10 / 8.5	82 / NA	46 / 45	78 / 102 / 92	3	112
3/15/2005	11:00 AM	AZ/PK	23632.5	23501	NA / NA	83 / 79	11/8.5	80 / NA	50 / 49	72 / 100 / 88	3.1	75
4/6/2005	8:00 AM	AZ	24150.8	24109.3	NA / NA	78 / 74	10/9.0	76/ NA	48 / 46	68 / 98 / 85	3	105
5/11/2005	10:00 AM	AZ/BL	24994.5	24863	NA / NA	76 / 76	11 / 9	76 / NA	44 / 40	78 / 104 / 75	3.5	110
6/21/2005	10:00 AM	BL	25975.9	25844.4	NA / NA	80 / 82	11 / 14	84 / NA	43 / 42	76 / 105 / 75	3.5	110
7/13/2005	10:00 AM	AZ/DV	26502.9	26371.4	NA / NA	82 / 82	11 / 9.0	90 / NA	45 / 41	79 / 108 / 79	3.5	128
8/12/2005	10:00 AM	DV	27200.9	27069.4	NA / NA	69 / 79	/ 9.0	80 /NA	43 / 41	70 / / 47	4	120
9/20/2005	10:00 AM	DV	27794.0	27662.6	NA / NA	67 / 70	7.5 / 9.0	72 / NA	34 / 34	61 /90 /66	4	100
10/10/2005	11:00AM	DV	28497.2	28365.8	NA / NA	70/70	9.0/8.0	73/NA	40/39	67/90/69	3.5	68
11/16/2005	10:00 AM	DC	29146.7	29015.3	NA / NA	NA	NA	NA	NA	NA	NA	NA
12/7/2005	10:00AM	DC	29480.3	29015.3	NA/NA	NA	NA	NA	42/41	48/80/58	3.2	50

Table A-7

BIOSPARGING COMPRESSOR SYSTEM OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	SVE HOUR METER (hour)	AS HOUR METER (hour)	GAST COMPRESSOR DATA				ROTRON BLOWER DATA			
					INFLUENT		DISCHARGE		INFLUENT		EFFLUENT	
					V-1 / V-2 (in H_2O)	T-1 / T-2 (°F)	P-1/P-2 (psig)	T-3 / F-1 (°F) / (in H2O)	V-3 / V-4 (in H2O)	T-4/T-5/T-6 (°F/C/C)	P-3 (psig)	F-2 (scfm)
1/4/2006	10:00AM	DC	30151.3	29398.1	NA/NA	70/68	/13.5	92/NA	41/40	62/94/66	3.5	50
2/6/2006	11:00AM	DC	30943.1	30177.5	NA/NA	72/72	/13.5	100/NA	35/35	61/100/69	4	50
3/13/2006	11:00 AM	DC	31783.4	31017.9	NA/NA	70/71	/13.5	108/NA	23/23	63/78/32	4.5	50
4/5/2006	10:00 AM	DC	32333.1	31567.5	NA/NA	82/80	/13	122/NA	34/34	72/104/66	3.5	50
5/16/2006	11:00 AM	DC	33318.4	32552.9	NA/NA	100/93	15/13	136/NA	37/37	92/114/76	3.5	80
6/13/2006	12:50 PM	DC	33412.4	32646.8	NA/NA	93/85	13/13	116/NA	27/27	81/116/74	4	80
7/17/2006	11:00 AM	DC	34226.1	33460.6	NA/NA	88/88	15.5/12.7	130/NA	38/38	84/108/70	3.5	50
8/2/2006	11:00 AM	DC	34610.2	33844.7	NA/NA	90/88	15.5/12.5	127/NA	40/40	90/110/74	3.5	50
9/26/2006*	10:00AM	TM/JL			NA/NA	NA	NA	NA/NA	NA	NA	NA	NA
10/27/2006	12:30 PM	PK	36022.9	35257	NA/NA	78/80	14/12.5	115/NA	42/41	73/100/32	3.5	60
11/28/2006	11:10 AM	TM	36792.3	36026.5	NA/NA	53/52	14.2/13.5	80/8.5	38/38	55/92/22	3.5	70
12/28/2006	10:55 AM	TM	37510.4	36744.6	NA/NA	56/55	14.5/13	84/12.5	40/42	53/95/21	3.5	70
1/31/2007	9:15 AM	TM	38324.8	37558.9	NA/NA	52/52	14/13.5	85/10	41/41	54/92/22	4	70
2/28/2007	8:20 AM	TM	38995.9	38230.1	NA/NA	59/60	14/12.5	79/12	41/40	55/98/25	3.5	70
3/7/2007	8:00 AM	TM	39163.7	38397.9	NA/NA	75/75	12.5/14	110/12.5	40/41	75/110/35	3.5	70
4/17/2007	9:50 AM	TM	40146.4	39380.6	NA/NA	72/68	13/12.5	92/11	42/41	65/105/30	4	72
5/25/2007	9:25 AM	TM	41057.8	40292	NA/NA	65/72	0/0	78/0	45/43	70/100/30	3	0
6/8/2007	9:20 AM	TM	41392.8	40292.7	NA/NA	NA/NA	NA/NA	NA/NA	43/42	62/NA/28	3	70
7/24/2007	10:15 AM	DL	42496.4	41080.0	6/5	84/84	16/14	112/.06	46/46	80/114/38	4	70
8/23/2007	11:30 AM	DL	43216.0	41799.7	7/5.5	95/96	14/15	120/.85	45/44	82/115/40	3.5	70
9/19/2007	2:50 PM	PK	43740.8	42324.3	6.5 / 5.5	82 / 84	14 / 15.2	116 / NM	45 / 45	85 / 108 / 40	4	40
10/18/2007	12:45 PM	DC	44434.8	43018.3	NA/NA	84/88	14/15	98/NA	45/45	80/107/38	3.5	60
11/29/2007	12:45 PM	DL	45163.8	43747.4	NA/NA	60/58	13/13	58/.95	0	0	0	0
12/19/2007	4:00 PM	DW	45647.6	44231.2	NA/NA	70/62	13/12	76/NA	0/0	62/NA/20	0	system off
1/31/2008	12:30 PM	PK	46673.3	45256.9	14/12	68/65	10.2/9.8	59/.93	system off	system off	system off	system off
2/29/2008	11:00 AM	JM	47367.7	45948.9	NA/NA	60/66	10/9.5	68/NM	0/0	66/20/21	2	70
3/26/2008	10:30 AM	DW	47985.4	46566.6	4.5/4.5	60/60	15/15	63/NM	system off	55/NA/NA	system off	system off
4/17/2008	10:40 AM	JM	48514.4	47095.6	4.5/5.0	64/66	10/14	84/0.96	system off	62/NA/15	2	80
5/20/2008	10:00 AM	JM	49305.1	47886.4	4.8/5.4	74/74	NA/8	66/1	system off	system off	system off	system off
6/30/2008	12:50 PM	PK	50291.8	48873.1	system off	81/84	<2/~3	78/NA	system off	system off	system off	system off
7/15/2008	9:00 AM	JM	50292.2	48873.5	system off	system off	system off	system off	system off	system off	system off	system off
8/26/2008	11:15 AM	JM	50292.2	48873.5	system off	system off	system off	system off	system off	system off	system off	system off
9/25/2008	2:00 PM	JM	50292.2	48873.5	system off	system off	system off	system off	system off	system off	system off	system off
10/15/2008	9:30 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/7/2008	10:15 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/16/2008	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off

Table A-7

BIOSPARGING COMPRESSOR SYSTEM OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	SVE HOUR METER (hour)	AS HOUR METER (hour)	GAST COMPRESSOR DATA				ROTRON BLOWER DATA			
					INFLUENT		DISCHARGE		INFLUENT		EFFLUENT	
					V-1 / V-2 (in H_2O)	T-1 / T-2 (°F)	P-1/P-2 (psig)	T-3 / F-1 (°F) / (in H2O)	V-3 / V-4 (in H2O)	T-4/T-5/T-6 (°F/C/C)	P-3 (psig)	F-2 (scfm)
1/21/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/18/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/29/2009	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/27/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
6/12/2009	2:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/31/2009	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/23/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/20/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/20/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/5/2009	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
1/20/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/26/2010	10:00 AM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/16/2010	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/29/2010	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/28/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
7/29/2010	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/31/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/9/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/12/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/29/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/22/2010	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
1/21/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/23/2011	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/9/2011	12:00 PM	JM & IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/14/2011	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/16/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
6/7/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
7/19/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/23/2011	12:00 PM	PK	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/20/2011	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
10/28/2011	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/2/2011	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off

Table A-7

BIOSPARGING COMPRESSOR SYSTEM OPERATIONAL SUMMARY

MAINTENANCE FACILITY AREA (Cont)

DATE	TIME	OPERATOR INITIALS	SVE HOUR METER (hour)	AS HOUR METER (hour)	GAST COMPRESSOR DATA				ROTRON BLOWER DATA			
					INFLUENT		DISCHARGE		INFLUENT		EFFLUENT	
					V-1 / V-2 (in H_2O)	T-1 / T-2 (^{0}F)	P-1/P-2 (psig)	T-3 / F-1 (^{0}F) / (in H2O)	V-3 / V-4 (in H2O)	T-4/T-5/T-6 (^{0}F/C/C)	P-3 (psig)	F-2 (scfm)
2/1/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
2/16/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
3/14/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
4/26/2012	08:00 AM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
5/15/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
6/27/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
7/20/2012	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
8/10/2012	12:00 PM	JM	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/19/2012	11:15 AM	DL & EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
11/13/2012	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
12/27/2012	12:00 PM	DL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/17/2013	12:00 PM	IV	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/30/2014	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/15/2015	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/15/2016	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/27/2017	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/13/2018	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/25/2019	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off
9/14/2020	12:00 PM	EL	system off	system off	system off	system off	system off	system off	system off	system off	system off	system off

Notes:

For definition of monitoring points see as-built flow diagram

[a]Anomalous data

[b]Revised measurement using P-102 pressure gauge

* - System Problem, Unit turned off

^{0}F = degrees Fahrenheit

in H_2O = inches of water column

NA = Not Available

NM = Not Measured

psig = pounds per square inch gauge

scfm = standard cubic feet per minute

Table A-8

LNAPL RECOVERY SYSTEM EXTRACTION VOLUMES

DATE	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED[a] (gallons)	CUMULATIVE VOLUME OF LNAPL RECOVERED[b] (gallons)	THICKNESS OF LNAPL IN RECOVERY DRUM[b] (feet)	THICKNESS OF LNAPL IN WELL[b] (feet)	COMMENTS
		AV-06			
3/1/1999	7.8	7.3	0.33	0.38	System startup
3/10/1999	7.8	7.3	0.33	NM	
3/17/1999	7.8	7.3	0.33	NM	Replaced temporary pump with new pump
5/7/1999	55.0	7.8	0.33	0.01	Replaced recovery drum with new drum
5/27/1999	76.0	7.8	ND	NM	
6/14/1999	91.2	7.8	ND	0.01	Reset pump depth
6/25/1999	91.2	8.1	0.01	0.05	Replaced pump float
7/9/1999	92.7	8.1	ND	NM	Reset pump depth
7/22/1999	95.8	8.1	ND	NM	
8/3/1999	95.8	8.1	ND	NM	
8/30/1999	99.6	8.3	0.01	0.01	Replaced recovery drum with new drum
9/27/1999	99.6	8.3	ND	0.44	Recovery drum empty
12/2/1999	99.6	8.3	ND	ND	Recovery drum empty. Reset pump depth
4/24/2000	99.6	8.3	ND	ND	Revovery drum empty
9/14/2000	99.6	8.3	ND	0.26	GW level too low for LNAPL recovery
12/20/2000	113.7	8.3	ND	ND	No LNAPL recovered.
4/5/2001	113.7	8.3	ND	ND	
8/20/2001	113.7	8.3	ND	0.24	
2/6/2002	NM	NM	NM	ND	System off. No LNAPL recovered.
6/19/2002	NM	NM	NM	ND	System off. No LNAPL recovered.
9/11/2002	NM	NM	NM	ND	System off. No LNAPL recovered.
12/2/2002	NM	NM	NM	ND	System off. No LNAPL recovered.
3/4/2003	NM	NM	NM	ND	Removed pump and disposed of product
6/12/2003	NM	NM	NM	ND	Removed pump and product on 3/4/03
9/8/2004	NM	NM	NM	ND	Removed pump and product on 3/4/03
9/26/2006	ND	NM	NM	ND	No LNAPL present
9/19/2007	NM	NM	NM	ND	No LNAPL present
9/23/2008	NM	NM	NM	0.001	sheen
9/23/2009	NM	NM	NM	ND	No LNAPL present
9/8/2010	NM	NM	NM	ND	No LNAPL present
9/21/2011	NM	NM	NM	ND	No LNAPL present
9/20/2012	NM	NM	NM	0.001	sheen
9/17/2013	NM	NM	NM	ND	No LNAPL present
9/29/2014	NM	NM	NM	ND	No LNAPL present
9/14/2015	NM	NM	NM	ND	No LNAPL present
9/15/2016	NM	NM	NM	ND	No LNAPL present
9/27/2017	NM	NM	NM	ND	No LNAPL present
9/13/2018	NM	NM	NM	ND	No LNAPL present
9/25/2019	NM	NM	NM	ND	No LNAPL present
9/14/2020	NM	NM	NM	ND	No LNAPL present

Notes:

Measurements of LNAPL collected from well AV-06 are presented in Table A-1.

[a]Total volume of LNAPL and water recovered.

[b]Gauged using interface probe.

LNAPL = Light Non-Aqueous Phase Liquid

ND = Not Detected

NM = Not Measured

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
BV-13						
06/19/02	NM	0.0	0.0	0.0	0.0	MFA system startup
09/11/02	NM	0.0	0.0	0.0	0.0	
12/02/02	0.7	1.0	1.0	2.0	2.0	Initial observation of DNAPL in BV-13
03/04/03	<0.5	0.0	1.0	0.0	2.0	
06/12/03	1.0	1.0	2.0	4.0	6.0	
7/10/2003	0.8	0.5	2.5	2.5	8.5	
8/27/2003	NM	0.0	2.5	0.0	8.5	
9/10/2003	NM	0.0	2.5	0.0	8.5	
10/14/2003	0.8	1.0	3.5	3.0	11.5	
11/12/2003	0.8	1.0	4.5	3.0	14.5	
12/11/2003	0.5	0.8	5.3	7.0	21.5	2 hr pump test - no product observed after
1/15/2004	0.0	0.0	5.3	3.0	24.5	No DNAPL observed
2/10/2004	0.8	1.0	6.3	3.0	27.5	
3/11/2004	Trace	0.0	6.3	2.0	29.5	NAPL droplets in one bailer - mid process
4/26/2004	0.8	0.5	6.8	2.0	31.5	
5/11/2004	0.5	0.0	6.8	0.0	31.5	
6/1/2004	0.0	0.0	6.8	0.0	31.5	
7/14/2004	0.0	0.0	6.8	0.0	31.5	
8/10/2004	0.0	0.0	6.8	0.0	31.5	
9/8/2004	NM	0.0	6.8	0.0	31.5	Well Cap Stuck on
10/12/2004	NM	0.0	6.8	3.0	34.5	Cut off well cap and replaced with J-plug
11/19/2004	Trace	0.1	6.9	3.0	37.5	NAPL droplets in water column
12/13/2004	0.5	3.0	9.9	5.0	42.5	
1/20/2005	0.5	1.0	10.9	3.5	46.0	
2/18/2005	0.5	1.0	11.9	4.0	50.0	
3/15/2005	0.5	0.0	11.9	0.0	50.0	
4/6/2005	0.4	0.6	12.5	4.0	54.0	
5/11/2005	0.7	0.5	13.0	4.0	58.0	Replace flow valve.
6/21/2005	0.6	1.0	14.0	4.0	62.0	
7/13/2005	0.6	1.0	15.0	4.0	66.0	
8/12/2005	0.5	1.0	16.0	4.0	70.0	
9/20/2005	0.5	1.0	17.0	4.0	74.0	
10/20/2005	0.4	1.0	18.0	3.5	77.5	
11/16/2005	NA	NA	NA	NA	NA	Broken Heat Exchanger / ^ Vehicle Traffi
12/7/2005	0.7	0.5	18.5	3.5	81.0	Heat Exchanger still down
1/4/2006	0.1	0.1	18.6	3.0	84.0	System running
2/6/2006	0.5	0.3	18.9	3.0	87.0	
3/13/2006	Trace	0.1	19.0	1.0	88.0	System was down / restarted
4/5/2006	0.1	0.3	19.3	3.0	91.0	
5/16/2006	Trace	0.1	19.4	3.0	94.0	
6/13/2006	Trace	0.1	19.5	2.0	96.0	
7/17/2006	0.1	0.1	19.6	3.0	99.0	
8/2/2006	Trace	0.1	19.7	2.0	101.0	
9/26/2006	0.5	0.0	19.7	0.0	101.0	System down
10/27/2006	0.5	0.5	20.2	2.5	103.5	
11/28/2006	0.5	0.5	20.7	3.0	106.5	
12/28/2006	0.4	0.5	21.2	3.0	109.5	
1/31/2007	0.5	0.5	21.7	3.0	112.5	
2/28/2007	0.2	0.3	22.0	2.0	114.5	
3/7/2007	NM	NM	NM	NM	NM	
4/17/2007	0.1	0.3	22.3	3.0	117.5	
5/25/2007	0.1	0.3	22.6	1.0	118.5	
6/8/2007	0.1	0.3	22.9	2.5	121.0	
7/24/2007	0.1	0.3	23.2	1.0	122.0	
8/23/2007	0.1	0.1	23.3	0.5	122.5	

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
BV-13 (cont)						
9/20/2007	0.75	0.5	23.8	2	124.5	
10/18/2007	0.3	0.1	23.9	5	129.5	
11/29/2007	Trace	0.1	24	0.5	130	
12/19/2007	NM	NM	NM	NM	130	
1/31/2008	Trace	0	24	3	133	
2/29/2008	Trace	0	24	0.3	133.3	
3/26/2008	Trace	0.3	24.3	9.0	142.3	
4/17/2008	Trace	0.2	24.5	10.0	152.3	
5/20/2008	Trace	0	24.5	8	160.3	
6/30/2008	Trace	0.1	24.6	3	163.3	
7/15/2008	0.25	0.025	24.6	5	168.3	
8/26/2008	0.5	0.25	24.9	0.25	168.6	
9/25/2008	0.5	0.5	25.4	4	172.6	
10/15/2008	0.4	0.33	25.7	5	177.6	
11/7/2008	0.25	0.3	26.0	5	182.6	
12/16/2008	0.1	0.2	26.2	4	186.6	
1/21/2009	0.5	0.125	26.3	4.5	191.1	
3/18/2009	0.25	0.125	26.5	3	194.1	
4/29/2009	NM	NM	NM	NM	NM	
5/27/2009	Trace	Trace	26.5	4	198.1	
6/12/2009	0	0	26.5	4	202.1	
8/31/2009	0.1	0.1	26.6	3	205.1	
9/23/2009	0.10	0.2	26.8	3	208.1	
10/20/2009	0.1	0.17	27.0	3	211.1	
11/20/2009	0.1	0.05	27.1	3	214.1	
12/5/2009	0.05	Trace	27.1	3	217.1	
1/20/2010	0.25	0.1	27.2	5	222.1	
2/26/2010	0.1	0.1	27.3	4	226.1	
3/16/2010	Trace	Trace	27.3	4	230.1	
4/29/2010	Trace	Trace	27.3	3	233.1	
5/28/2010	0.1	0.1	27.4	8	241.1	
7/29/2010	0.1	0.1	27.5	3	244.1	
8/31/2010	Trace	Trace	27.5	3	247.1	
9/9/2010	0.1	0.3	27.8	3	250.1	
10/12/2010	0.1	0.1	27.9	3.4	253.5	
11/29/2010	0.02	0.01	27.9	2.5	256.0	
12/22/2010	0.1	0.01	27.9	3	259.0	
1/21/2011	0.01	0.1	28.0	4	263.0	Slightly more than just a sheen on top ~3 mm thick. DNAPL is more dilute/opaque than historically.
2/23/2011	Sheen	0	28.0	3	266.0	GW clean with slight sheen - no free product observed at bottom of well
3/9/2011	0.01	0.01	28.0	3	269.0	Sheen on surface
4/14/2011	Trace	Trace	28.0	3	272.0	Sheen on water
5/16/2011	0.001	0.001	28.0	3	275.0	Surface sheen. Least DNAPL observed compared to other O&M observations by me
6/7/2011	0.01	0.01	28.0	3	278.0	
7/19/2011	0.01	0.01	28.1	3	281.0	
8/23/2011	0.04	0.06	28.1	3	284.0	
9/20/2011	0.01	0.001	28.1	3	287.0	~1/4-1/2 inch apparent on bottom
10/28/2011	0.4	0.2	28.3	3.5	290.5	
12/2/2011	0.02	0.06	28.4	3	293.5	
2/1/2012	0.05	0.04	28.4	3	296.5	
2/16/2012	Trace	Trace	28.4	3	299.5	Not much product in wel
3/14/2012	Trace	Trace	28.4	2	301.5	Limited volume bailed due to limited product and no draw down in well; water recharged very quick
4/26/2012	Trace	Trace	28.4	3	304.5	Still little DNAPL recovered
5/15/2012	Trace	Trace	28.4	2	306.5	Very little product

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
BV-13 (cont)						
6/27/2012	0.2	0.18	28.6	6	312.5	
7/20/2012	Sheen	0.00	28.6	4	316.5	Sheen and strong creosote-like odor
8/10/2012	0	0.00	28.6	3.5	320.0	
9/19/2012	0	0.00	28.6	1.25	321.25	Water clear with sheen
11/13/2012	Trace	Trace	28.6	2	323.25	
12/27/2012	0	0.00	28.6	0.25	323.5	Water is clear with sheen (heavy)
1/30/2013	Trace	Trace	28.6	1	324.5	
2/25/2013	Trace	Trace	28.6	1	325.5	
3/14/2013	0.02	Trace	28.6	2	327.5	
4/25/2013	0.15	Trace	28.6	3	330.5	
5/31/2013	Trace	Trace	28.6	3	333.5	
6/18/2013	Trace	0.01	28.6	3	336.5	
8/26/2013	Trace	0.00	28.6	3	339.5	
9/17/2013	0.00	0.00	28.6	2	341.5	
10/15/2013	Trace	0.00	28.6	1	342.5	
11/27/2013	Trace	0.01	28.6	NA	342.5	
12/27/2013	Trace	0.01	28.6	NA	342.5	
1/23/2014	0.29	0.25	28.9	3.5	346.0	DTB 7.38
2/5/2014	0.19	0.01	28.9	1.5	347.5	DTB 7.38
3/7/2014	0.08	0.05	28.9	0.5	348.0	skimmed bottom of well w/ p. pump; DTB 7.60
4/24/2014	0.05	0.00	28.9	0	348.0	DTB 7.34
5/22/2014	0.06	0.04	29.0	4	352.0	DTB 7.35
6/20/2014	0.04	0.05	29.0	3.5	355.5	DTB 7.38
7/9/2014	0.05	0.03	29.1	4	359.5	DTB 7.37
8/13/2014	0.11	0.018	29.1	4	363.5	DTB 7.37
9/30/2014	0.01	0.01	29.1	4	367.5	DTB 7.34
10/15/2014	0.34	0.22	29.3	3	370.5	DTB 7.37
11/4/2014	0.04	0.03	29.3	3	373.5	DTB 7.38
12/3/2014	0.04	0.03	29.4	3.5	377.0	DTB 7.38
1/21/2015	0.05	0.03	29.4	3.5	380.5	DTB 7.37' 0.653 gal/ft in 4" well casing
2/18/2015	0.05	0.03	29.4	3	383.5	DTB 7.37', 4" well casing 0.653 g/ft
3/3/2015	0.03	0.02	29.4	3.0	386.5	DTB 7.36', 4" well 0.653 gal/ft
4/23/2015	0.02	0.013	29.5	3.0	389.5	DTB 7.34, 4" well = 0.653 gal/ft
5/26/2015	0.06	0	29.5	0	389.5	DTB 7.35', unable to pump due to site ops
8/24/2015	0.06	0.04	29.5	NM	389.5	DTB 7.34', 4" well = 0.653 gal/ft
7/7/2015	0.16	NM	29.5	3	392.5	DTB 7.38'
8/14/2015	0.02	0.013	29.5	2	394.5	DTB 7.38', 4" well = 0.653 gal/ft
9/15/2015	0.06	0.04	29.5	3.5	398.0	DTB 7.38', pumped well dry 4" = 0.653 gal/ft
10/21/2015	0.33	0.22	29.8	3.0	401.0	DTB 7.36', pumped well dry 4" = 0.653 gal/ft
11/4/2015	0.09	0.06	29.8	3.5	404.5	DTB 7.37', 4" = 0.653 gal/ft
12/22/2015	0.06	0.40	30.2	4.0	408.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
1/5/2016	0.04	0.03	30.3	4.0	412.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
2/11/2016	0.04	0.03	30.3	3.0	415.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
3/23/2016	0.04	0.03	30.3	3.5	419.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
4/6/2016	0.02	0.01	30.3	3.0	422.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
5/4/2016	0.04	0.03	30.4	3.0	425.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
6/15/2016	0.02	0.01	30.4	3.0	428.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
7/21/2016	0.05	0.03	30.4	4.0	432.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
8/10/2016	0.07	0.05	30.4	4.0	436.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
9/15/2016	0.07	0.05	30.5	3.0	439.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
10/6/2016	0.08	0.05	30.5	3.0	442.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
11/16/2016	0.05	0.03	30.6	2.5	444.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
12/15/2016	Trace	0.00	30.6	0.0	444.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
1/4/2017	NM	NM	30.6	NM	444.5	No Measureable Product Observed
2/1/2017	0.04	0.03	30.6	2.0	446.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
3/22/2017	0.04	0.03	30.7	3.5	450.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
4/13/2017	Trace	0.00	30.7	0.0	450.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
5/2/2017	0.05	0.03	30.7	2.5	452.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
6/6/2017	0.04	0.03	30.7	2.5	455.0	DTB 7.34', 4" well casing = 0.653 gal/ft,
7/19/2017	0.05	0.03	30.8	2.5	457.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
8/1/2017	0.06	0.04	30.8	3.0	460.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
9/28/2017	0.06	0.04	30.8	2.0	462.5	DTB 7.34', 4" well casing = 0.653 gal/ft,
10/26/2017	0.12	0.08	30.9	4.0	466.5	DTB 7.34', 4" well casing = 0.653 gal/ft, thick tar like strings plugged tubing and stopped flow @ 4 gal. Little recovery since 3 gal so ended purging
11/15/2017	0.06	0.039	30.9	3.0	469.5	4" Well casing= 0.653 gal/ft DTB: 7.34'
12/20/2017	0.06	0.039	31.0	4.0	473.5	4" Well casing= 0.653 gal/ft DTB: 7.34'
1/10/2018	0.05	0.030	31.0	3.0	476.5	4" Well casing= 0.653 Gal/Ft, DTB: 7.34'
2/21/2018	0.07	0.050	31.1	2.5	479.0	4" Well casing= 0.653 gal/ft DTB: 7.34'
3/22/2018	0.05	0.030	31.1	2.5	481.5	4" Well casing= 0.653 gal/ft DTB: 7.34'
4/17/2018	0.07	0.050	31.1	4.0	485.5	4" Well casing= 0.653 gal/ft DTB: 7.34' Thick DNAPL
5/22/2018	0.07	0.050	31.2	3.0	488.5	4" Well casing= 0.653 gal/ft DTB: 7.34'
6/27/2018	0.06	0.040	31.2	2.5	491.0	4" Well casing= 0.653 gal/ft DTB: 7.34'
7/17/2018	0.06	0.040	31.3	2.5	493.5	4" Well casing= 0.653 gal/ft DTB: 7.34'
8/23/2018	0.08	0.052	31.3	3.0	496.5	4" Well casing= 0.653 gal/ft DTB: 7.34', well pumped dry
9/13/2018	0.15	0.098	31.4	3.0	499.5	4" Well casing= 0.653 gal/ft DTB: 7.34'
10/24/2018	0.06	0.040	31.5	4.0	503.5	4" Well casing=0.653 Gal/Ft, DTB: 7.34'
11/1/2018	0.07	0.050	31.5	3.0	506.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
12/20/2018	0.06	0.040	31.6	3.0	509.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
1/23/2019	0.04	0.030	31.6	3.0	512.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
2/14/2019	0.06	0.040	31.6	3.0	515.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
3/21/2019	0.03	0.020	31.6	2.0	517.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
4/3/2019	0.04	0.030	31.7	3.0	520.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
5/9/2019	0.05	0.030	31.7	3.0	523.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
6/20/2019	trace	trace	31.7	not measurable	523.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
7/24/2019	0.04	0.030	31.7	3.0	526.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
8/28/2019	0.04	0.030	31.8	3.0	529.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
9/25/2019	0.05	0.030	31.8	2.0	531.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
10/30/2019	0.06	0.040	31.8	3.0	534.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
11/26/2019	0.05	0.030	31.9	3.0	537.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
12/26/2019	0.05	0.030	31.9	2.0	539.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
1/16/2020	0.04	0.030	31.9	3.0	542.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
2/6/2020	0.05	0.030	32.0	2.0	544.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
3/25/2020	0.07	0.050	32.0	2.0	546.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
4/1/2020	0.03	0.020	32.0	2.0	548.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
5/6/2020	0.05	0.030	32.1	2.5	551.0	4" Well casing=0.653 Gal/Ft, DTB:7.34'
6/18/2020	trace	0.000	32.1	0.0	551.0	Water not pumped
7/16/2020	0.06	0.040	32.1	2.0	553.0	4" Well casing=0.653 Gal/Ft, DTB:7.34'
8/5/2020	0.08	0.000	32.1	0.0	553.0	Water not pumped due to through traffic
9/9/2020	0.07	0.050	32.1	2.0	555.0	Water not pumped due to through traffic
9/15/2020	0.05	0.030	32.2	2.0	557.0	Water not pumped due to through traffic
10/29/2020	0.03	0.020	32.2	2.0	559.0	4" Well casing=0.653 Gal/Ft, DTB:7.34'
11/25/2020	0.06	0.040	32.2	2.5	561.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'
12/30/2020	0.06	0.040	32.3	2.0	563.5	4" Well casing=0.653 Gal/Ft, DTB:7.34'

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
AV-10						
4/26/2004	0.5	0.4	0.4	2.0	2.0	
5/1/2004	0.5	0.4	0.4	2.0	2.0	
6/1/2004	0.5	0.4	0.4	2.0	2.0	
7/14/2004	0.4	0.3	0.7	2.0	4.0	
8/10/2004	0.4	0.3	0.7	2.0	4.0	
9/8/2004	0.0	0.0	0.8	8.0	12.0	
10/12/2004	0.0	0.0	0.8	2.0	14.0	
11/19/2004	0.0	0.0	0.8	0.0	14.0	
12/13/2004	NM	0.5	1.3	4.0	18.0	NM due to pressure
1/20/2005	NM	0.0	1.3	0.0	18.0	
2/18/2005	0.0	0.0	1.3	0.0	18.0	Well Obstructed with Port equipment
3/15/2005	NM	0.0	1.6	5.0	23.0	
4/6/2005	0.0	0.0	1.6	4.0	27.0	
5/11/2005	ND	0.0	1.6	0.0	27.0	Product odor/sheen observed, no free product
6/21/2005	0.0	0.0	1.6	0.5	27.5	Product odor/sheen observed, no free product
7/13/2005	0.0	0.0	1.6	0.0	27.5	
8/12/2005	0.0	0.0	1.6	0.0	27.5	
9/20/2005	0.0	.0.	1.6	0.0	27.5	
10/20/2005	0.0	0.0	1.6	0.0	27.5	Product odor noted but no product observed
11/16/2005	NA	NA	NA	NA	NA	System Down Broken Heat Exchanger
12/7/2005	0.0	0.0	1.6	0.0	27.5	Heat Exchanger still down
1/4/2006	0.0	0.0	1.6	0.0	27.5	
2/6/2006	0.0	0.0	1.6	0.0	27.5	
3/13/2006	0.0	0.0	1.6	0.0	27.5	
4/5/2006	0.0	0.0	1.6	0.0	27.5	
5/16/2006	0.0	0.0	1.6	0.0	27.5	
6/13/2006	0.0	0.0	1.6	0.0	27.5	
7/17/2006	0.0	0.0	1.6	0.0	27.5	
8/2/2006	0.0	0.0	1.6	0.0	27.5	
9/27/2006	0.0	0.0	1.6	0.0	27.5	System Down Product in sample - suspended
10/27/2006	0.0	0.0	1.6	0.0	27.5	
11/28/2006	NM	NM	NM	NM	NM	
12/28/2006	NM	NM	NM	NM	NM	
1/31/2007	NM	NM	NM	NM	NM	
2/28/2007	NM	NM	NM	NM	NM	
3/7/2007	NM	NM	NM	NM	NM	
4/17/2007	NM	NM	NM	NM	NM	
5/25/2007	NM	NM	NM	NM	NM	
6/8/2007	NM	NM	NM	NM	NM	
7/24/2007	NM	NM	NM	NM	NM	
8/23/2007	NM	NM	NM	NM	NM	
9/19/2007	NM	NM	NM	NM	NM	
10/18/2007	0.0	0.0	1.6	0.0	27.5	
11/29/2007	NM	NM	NM	NM	NM	
12/19/2007	NM	NM	NM	NM	NM	
1/31/2008	NM	NM	NM	NM	NM	
2/29/2008	0	0	1.6	0	27.5	
3/26/2008	0	0	1.6	1.5	29	
4/17/2008	NM	NM	NM	NM	NM	
5/20/2008	NM	NM	NM	NM	NM	
6/30/2008	NM	NM	NM	NM	NM	
7/15/2008	NM	NM	NM	NM	NM	
8/26/2008	NM	NM	NM	NM	NM	
9/25/2008	0	0	1.6	0	29	
10/15/2008	NM	NM	NM	NM	NM	
11/7/2008	NM	NM	NM	NM	NM	

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
AV-10 (cont)						
12/16/2008	NM	NM	NM	NM	NM	
1/21/2009	NM	NM	NM	NM	NM	
3/19/2009	0	0	1.6	0	29	
4/29/2009	NM	NM	NM	NM	NM	
5/27/2009	NM	NM	NM	NM	NM	
6/12/2009	0	0	1.6	4	33	
8/31/2009	0	0	1.6	0	33	
9/23/2009	0	0	1.6	1	34	
10/20/2009	NM	NM	NM	NM	NM	
11/20/2009	NM	NM	NM	NM	NM	
12/5/2009	NM	NM	NM	NM	NM	
1/20/2010	NM	NM	NM	NM	NM	
2/26/2010	NM	NM	NM	NM	NM	
3/16/2010	NM	NM	NM	NM	NM	
4/29/2010	NM	NM	NM	NM	NM	
5/28/2010	NM	NM	NM	NM	NM	
7/29/2010	NM	NM	NM	NM	NM	
8/31/2010	NM	NM	NM	NM	NM	
9/9/2010	NM	NM	NM	NM	NM	
10/12/2010	NM	NM	NM	NM	NM	
11/29/2010	NM	NM	NM	NM	NM	
12/22/2010	NM	NM	NM	NM	NM	
1/21/2011	NM	NM	NM	NM	NM	
2/23/2011	NM	NM	NM	NM	NM	
3/9/2011	NM	NM	NM	NM	NM	
4/14/2011	NM	NM	NM	NM	NM	
5/16/2011	NM	NM	NM	NM	NM	
6/7/2011	NM	NM	NM	NM	NM	
7/19/2011	NM	NM	NM	NM	NM	
8/23/2011	NM	NM	NM	NM	NM	
9/20/2011	NM	NM	NM	NM	NM	
10/28/2011	NM	NM	NM	NM	NM	
12/2/2011	NM	NM	NM	NM	NM	
2/1/2012	NM	NM	NM	NM	NM	
2/16/2012	NM	NM	NM	NM	NM	
3/14/2012	NM	NM	NM	NM	NM	
4/26/2012	NM	NM	NM	NM	NM	
5/15/2012	NM	NM	NM	NM	NM	
6/27/2012	NM	NM	NM	NM	NM	
7/20/2012	NM	NM	NM	NM	NM	
8/10/2012	NM	NM	NM	NM	NM	
9/19/2012	NM	NM	NM	NM	NM	
11/13/2012	NM	NM	NM	NM	NM	
12/27/2012	NM	NM	NM	NM	NM	
2/25/2013	NM	NM	NM	NM	NM	
3/14/2013	NM	NM	NM	NM	NM	
9/18/2013	NM	NM	NM	NM	NM	
3/14/2014	NM	NM	NM	NM	NM	
9/30/2014	NM	NM	NM	NM	NM	
3/4/2015	NM	NM	NM	NM	NM	
9/15/2015	NM	NM	NM	NM	NM	
3/23/2016	NM	NM	NM	NM	NM	
9/15/2016	NM	NM	NM	NM	NM	
1/4/2017	NM	NM	NM	NM	NM	
2/1/2017	NM	NM	NM	NM	NM	
3/22/2017	NM	NM	NM	NM	NM	
4/13/2017	NM	NM	NM	NM	NM	
5/2/2017	NM	NM	NM	NM	NM	
6/6/2017	NM	NM	NM	NM	NM	
7/19/2017	NM	NM	NM	NM	NM	
8/1/2017	NM	NM	NM	NM	NM	
9/28/2017	NM	NM	NM	NM	NM	
10/26/2017	NM	NM	NM	NM	NM	
11/15/2017	NM	NM	NM	NM	NM	
12/20/2017	NM	NM	NM	NM	NM	
1/10/2018	NM	NM	NM	NM	NM	
2/21/2018	NM	NM	NM	NM	NM	
3/22/2018	NM	NM	NM	NM	NM	
4/17/2018	NM	NM	NM	NM	NM	
5/22/2018	NM	NM	NM	NM	NM	
6/27/2018	NM	NM	NM	NM	NM	
7/17/2018	NM	NM	NM	NM	NM	
8/23/2018	NM	NM	NM	NM	NM	
9/13/2018	NM	NM	NM	NM	NM	
10/24/2018	NM	NM	NM	NM	NM	
11/1/2018	NM	NM	NM	NM	NM	
12/20/2018	NM	NM	NM	NM	NM	
1/23/2019	NM	NM	NM	NM	NM	
2/14/2019	NM	NM	NM	NM	NM	
3/21/2019	NM	NM	NM	NM	NM	
4/3/2019	NM	NM	NM	NM	NM	
5/9/2019	NM	NM	NM	NM	NM	
6/20/2019	NM	NM	NM	NM	NM	
7/24/2019	NM	NM	NM	NM	NM	
8/28/2019	NM	NM	NM	NM	NM	
9/25/2019	NM	NM	NM	NM	NM	
10/30/2019	NM	NM	NM	NM	NM	
11/26/2019	NM	NM	NM	NM	NM	
12/26/2019	NM	NM	NM	NM	NM	
1/16/2020	NM	NM	NM	NM	NM	
2/6/2020	NM	NM	NM	NM	NM	
3/25/2020	NM	NM	NM	NM	NM	
4/1/2020	NM	NM	NM	NM	NM	
5/6/2020	NM	NM	NM	NM	NM	
6/18/2020	NM	NM	NM	NM	NM	
7/16/2020	NM	NM	NM	NM	NM	
8/5/2020	NM	NM	NM	NM	NM	
9/9/2020	NM	NM	NM	NM	NM	
9/15/2020	NM	NM	NM	NM	NM	
10/29/2020	NM	NM	NM	NM	NM	
11/23/2020	NM	NM	NM	NM	NM	
12/30/2020	NM	NM	NM	NM	NM	

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
97-6A						
12/11/2003	1.2	1.5	1.5	2.0	2.0	1 hr pump tests - product remaining after
1/15/2004	NA	0.0	1.5	3.0	5.0	Cannot get below 12.5-ft bgs in 97-6A
2/10/2004	NA	0.0	1.5	0.0	5.0	Cannot get below 12.5-ft bgs in 97-6A
3/11/2004	0.8	0.8	2.3	5.0	10.0	Used 1-in PVC rod to get bailer to bottom
4/26/2004	0.8	0.5	2.8	2.0	12.0	
05/11/04	Well Abandoned by grouting to Surface and Removing Monument					
04-6A (Replaces well 97-6A)						
5/11/2004	0.0	0.0	0.0	0.0	0.0	Well installed, 55 gallons purged
6/21/2004	0.0	0.0	0.0	3.0	3.0	Product odor noted but no product observed
7/14/2004	0.0	0.0	0.0	2.0	5.0	Product odor noted but no product observed
8/10/2004	0.0	0.0	0.0	2.0	7.0	Product odor noted but no product observed
9/8/2004	0.0	0.0	0.0	50.0	57.0	Product odor noted but no product observed
10/12/2004	0.0	0.0	0.0	50.0	57.0	Product odor noted but no product observed
11/19/2004	0.0	0.0	0.0	50.0	57.0	Product odor noted but no product observed
12/13/2004	0.0	0.0	0.0	50.0	57.0	Product odor noted but no product observed
1/20/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
2/18/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
3/15/2005	0.0	0.0	0.0	50.0	57.0	Product odor noted but no product observed
4/6/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
5/11/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
6/21/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
7/13/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
8/12/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
10/20/2005	0.0	0.0	0.0	0.0	57.0	Product odor noted but no product observed
11/16/2005	NA	NA	NA	NA	NA	System Down Broken Heat Exchanger
12/7/2005	0.0	0.0	0.0	0.0	57.0	Heat Exchanger still down
1/4/2006	0.0	0.0	0.0	0.0	57.0	
2/6/2006	0.0	0.0	0.0	0.0	57.0	
3/13/2006	0.0	0.0	0.0	0.0	57.0	
4/5/2006	0.0	0.0	0.0	0.0	57.0	
5/16/2006	0.0	0.0	0.0	0.0	57.0	
6/13/2006	0.0	0.0	0.0	0.0	57.0	
7/17/2006	0.0	0.0	0.0	0.0	57.0	
8/2/2006	0.0	0.0	0.0	0.0	57.0	
9/26/2006	0.0	0.0	0.0	0.0	57.0	System Down,
10/27/2006	0.0	0.0	0.0	0.0	57.0	
11/28/2006	NM	NM	NM	NM	NM	
12/28/2006	NM	NM	NM	NM	NM	
1/31/2007	NM	NM	NM	NM	NM	
2/28/2007	NM	NM	NM	NM	NM	
3/7/2007	NM	NM	NM	NM	NM	
4/17/2007	NM	NM	NM	NM	NM	
5/25/2007	NM	NM	NM	NM	NM	
6/8/2007	NM	NM	NM	NM	NM	
7/24/2007	NM	NM	NM	NM	NM	
8/23/2007	NM	NM	NM	NM	NM	
9/19/2007	NM	NM	NM	NM	NM	
10/18/2007	0.0	0.0	0.0	0.0	57.0	
11/29/2007	NM	NM	NM	NM	NM	
12/19/2007	NM	NM	NM	NM	NM	
1/31/2008	NM	NM	NM	NM	NM	
2/29/2008	NM	NM	NM	NM	NM	
3/26/2008	NM	NM	NM	NM	NM	
4/17/2008	NM	NM	NM	NM	NM	
5/20/2008	NM	NM	NM	NM	NM	
6/30/2008	NM	NM	NM	NM	NM	
7/15/2008	NM	NM	NM	NM	NM	
8/26/2008	NM	NM	NM	NM	NM	
9/25/2008	0.0	0.0	0.0	3.0	60.0	
10/15/2008	NM	NM	NM	NM	NM	
11/7/2008	NM	NM	NM	NM	NM	
12/16/2008	NM	NM	NM	NM	NM	

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
04-6A (Replaces well 97-6A) (cont)						
1/21/2009	NM	NM	NM	NM	NM	
3/18/2009	NM	NM	NM	NM	NM	
4/29/2009	NM	NM	NM	NM	NM	
5/27/2009	NM	NM	NM	NM	NM	
6/12/2009	0.0	0.0	0.0	0.25	60.3	
8/31/2009	NM	NM	NM	NM	NM	
9/23/2009	Sheen	0.0	0.0	1	61.3	
10/20/2009	NM	NM	NM	NM	NM	
11/20/2009	NM	NM	NM	NM	NM	
12/5/2009	NM	NM	NM	NM	NM	
1/20/2010	NM	NM	NM	NM	NM	
2/26/2010	NM	NM	NM	NM	NM	
3/16/2010	NM	NM	NM	NM	NM	
4/29/2010	NM	NM	NM	NM	NM	
5/28/2010	NM	NM	NM	NM	NM	
7/29/2010	NM	NM	NM	NM	NM	
8/31/2010	NM	NM	NM	NM	NM	
9/9/2010	NM	NM	NM	NM	NM	
10/12/2010	NM	NM	NM	NM	NM	
11/29/2010	NM	NM	NM	NM	NM	
12/22/2010	NM	NM	NM	NM	NM	
1/21/2011	NM	NM	NM	NM	NM	
2/23/2011	NM	NM	NM	NM	NM	
3/9/2011	NM	NM	NM	NM	NM	
4/14/2011	NM	NM	NM	NM	NM	
5/16/2011	NM	NM	NM	NM	NM	
6/7/2011	NM	NM	NM	NM	NM	
7/19/2011	NM	NM	NM	NM	NM	
8/23/2011	NM	NM	NM	NM	NM	
9/20/2011	NM	NM	NM	NM	NM	
10/28/2011	NM	NM	NM	NM	NM	
12/2/2011	NM	NM	NM	NM	NM	
2/1/2012	NM	NM	NM	NM	NM	
2/16/2012	NM	NM	NM	NM	NM	
3/14/2012	NM	NM	NM	NM	NM	
4/26/2012	NM	NM	NM	NM	NM	
5/15/2012	NM	NM	NM	NM	NM	
6/27/2012	NM	NM	NM	NM	NM	
7/20/2012	NM	NM	NM	NM	NM	
8/10/2012	NM	NM	NM	NM	NM	
9/19/2012	NM	NM	NM	NM	NM	
11/13/2012	NM	NM	NM	NM	NM	
12/27/2012	NM	NM	NM	NM	NM	
2/25/2013	NM	NM	NM	NM	NM	
3/14/2013	NM	NM	NM	NM	NM	
9/18/2013	NM	NM	NM	NM	NM	
3/6/2014	NM	NM	NM	NM	NM	
9/29/2014	NM	NM	NM	NM	NM	
3/3/2015	NM	NM	NM	NM	NM	
9/15/2015	NM	NM	NM	NM	NM	
3/23/2016	NM	NM	NM	NM	NM	
9/14/2016	NM	NM	NM	NM	NM	
9/28/2017	0.6	0.39	0.39	3	64.3	4" Well casing= 0.653 gal/ft DTB: 35.10
10/26/2017	0.10	0.07	0.46	3	67.3	DTB: 34.76
11/15/2017	trace	trace	0.46	0	67.3	No DNAPL observed DTB: 34.81
12/20/2017	trace	not measureable	0.46	4	71.3	4" Well casing= 0.653 gal/ft DTB: 34.80
1/10/2018	0.04	0.03	0.49	3.0	74.3	4" Well casing= 0.653 gal/ft, DTB: 34.78
2/21/2018	not measureable	not measureable	0.49	4.0	78.3	4" Well casing=0.653 gal/ft DTB: 34.81, Unable to measure, product too thick. Recovery observed though not measureable
3/22/2018	not measureable	not measureable	0.49	2.0	80.3	4" Well casing=0.653 gal/ft DTB: 35.10, DNAPL visible pumping off bottom of well, unable to quantify
4/17/2018	not measureable	not measureable	0.49	4.0	84.3	4" Well casing=0.653 gal/ft DTB:35.10, Unable to gauge product, DNAPL observed removed from well, unable to quantify
5/22/2018	0.06	0.040	0.53	4.0	88.3	4" Well casing=0.653 gal/ft DTB: 35.10
6/27/2018	0.07	0.050	0.58	4.0	92.3	4" Well casing=0.653 gal/ft DTB: 35.10
7/17/2018	not measureable	not measureable	0.58	4.0	96.3	4" Well casing=0.653 gal/ft DTB: 35.10. Trace product at surface
8/23/2018	0.12	0.078	0.658	3.0	99.3	4" Well casing=0.653 gal/ft DTB: 35.10
9/12/2018	not measureable	not measureable	0.658	3.0	102.3	4" Well casing=0.653 gal/ft DTB: 35.10, DNAPL unmeasureable
10/24/2018	0.36	0.240	0.898	4.0	106.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
11/1/2018	0.06	0.040	0.938	2.0	108.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
12/20/2018	0.09	0.060	0.998	3.0	111.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
1/23/2019	trace	not measureable	0.998	3.0	114.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
2/14/2019	trace	not measureable	0.998	3.0	117.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
3/21/2019	0.05	0.030	1.028	3.0	120.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
4/3/2019	not measureable	not measureable	1.028	3.0	123.3	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
5/9/2019	not measureable	not measureable	1.028	3.5	126.8	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
6/20/2019	trace	trace	1.028	not measureable	126.8	4" Well casing= 0.653 Gal/Ft, DTB: 35.1'
7/24/2019	0.12	0.080	1.108	4.6	131.38	4" Well casing= 0.653 Gal/Ft, DTB: 35.1', Trace LNAPL
8/28/2019	0.02	0.010	1.118	3.0	134.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1' Trace or Tape
9/25/2019	not measureable	not measureable	1.118	3.0	137.38	4" Well casing= 0.653 Gal/Ft, DTB: 35.1', Trace LNAPL, estimated comparable quantity to BV-13 observed when purging bottom of well.
10/30/2019	ND	ND	1.118	NM	137.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1',
11/26/2019	ND	ND	1.118	3.0	137.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1', DNAPL not observable on gauging. On purging thick black DNAPL pumped out of well for 30 min.
12/26/2019	0.030	0.020	1.138	2.0	139.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
1/16/2020	trace	not measureable	1.138	NM	139.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
2/6/2020	0.030	0.020	1.158	2.5	141.88	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
3/25/2020	trace	not measureable	1.158	1.5	143.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
4/1/2020	0.070	0.050	1.208	2.0	145.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
5/6/2020	0.030	0.020	1.228	3.0	148.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
6/18/2020	not measureable	not measureable	1.228	0.0	148.38	Did not pump. 4" Well casing=0.653 Gal/Ft, DTB: 35.1'
7/16/2020	0.030	0.020	1.248	2.0	150.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
8/5/2020	0.050	not measureable	1.248	0.0	150.38	Did not pump due to traffic. 4" Well casing=0.653 Gal/Ft, DTB: 35.1
9/9/2020	0.040	0.030	1.278	2.0	152.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
9/15/2020	0.030	0.020	1.298	2.5	154.88	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
10/29/2020	0.030	0.020	1.318	2.0	156.88	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
11/23/2020	trace	not measureable	1.318	2.5	159.38	4" Well casing=0.653 Gal/Ft, DTB: 35.1'
12/30/2020	trace	not measureable	1.318	0.0	159.38	Did not pump. 4" Well casing=0.653 Gal/Ft, DTB: 35.1'

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
97-6B						
6/21/2005	0.0	0.0	0.0	0.0	0.0	No odor, no sheen, no free product.
7/13/2005	0.0	0.0	0.0	0.0	0.0	No odor, no sheen, no free product.
9/20/2005	0.0	0.0	0.0	0.0	0.0	No odor, no sheen, no free product.
10/20/2005	0.0	0.0	0.0	0.0	0.0	No odor, no sheen, no free product.
11/16/2005	NA	NA	NA	NA	NA	System Down Broken Heat Exchanger
3/13/2006	0.0	0.0	0.0	0.0	0.0	
4/5/2006	0.0	0.0	0.0	0.0	0.0	
5/16/2006	0.0	0.0	0.0	0.0	0.0	
6/13/2006	0.0	0.0	0.0	0.0	0.0	
7/17/2006	0.0	0.0	0.0	0.0	0.0	
8/2/2006	0.0	0.0	0.0	0.0	0.0	
9/26/2006	0.0	0.0	0.0	0.0	0.0	System Down
10/27/2006	0.0	0.0	0.0	0.0	0.0	
11/28/2006	NM	NM	NM	NM	NM	
12/28/2006	NM	NM	NM	NM	NM	
1/31/2007	NM	NM	NM	NM	NM	
2/28/2007	NM	NM	NM	NM	NM	
3/7/2007	NM	NM	NM	NM	NM	
4/17/2007	NM	NM	NM	NM	NM	
5/25/2007	NM	NM	NM	NM	NM	
6/8/2007	NM	NM	NM	NM	NM	
7/24/2007	NM	NM	NM	NM	NM	
8/23/2007	NM	NM	NM	NM	NM	
9/19/2007	NM	NM	NM	NM	NM	
10/18/2007	0.0	0.0	0.0	0.0	0.0	
11/29/2007	NM	NM	NM	NM	NM	
12/19/2007	NM	NM	NM	NM	NM	
1/31/2008	NM	NM	NM	NM	NM	
2/29/2008	0.0	0.0	0.0	0.0	0.0	
3/26/2008	NM	NM	NM	NM	NM	
4/17/2008	NM	NM	NM	NM	NM	
5/20/2008	NM	NM	NM	NM	NM	
6/30/2008	NM	NM	NM	NM	NM	
7/15/2008	NM	NM	NM	NM	NM	
8/26/2008	NM	NM	NM	NM	NM	
9/25/2008	0.0	0.0	0.0	0.0	0.0	
10/15/2008	NM	NM	NM	NM	NM	
11/7/2008	NM	NM	NM	NM	NM	
12/16/2008	NM	NM	NM	NM	NM	
1/21/2009	NM	NM	NM	NM	NM	
3/18/2009	NM	NM	NM	NM	NM	
4/29/2009	NM	NM	NM	NM	NM	
5/27/2009	NM	NM	NM	NM	NM	
6/12/2009	0.0	0.0	0.0	4	4	
8/31/2009	0.0	0.0	0.0	0.0	4	
9/23/2009	0.0	0.0	0.0	1	5	
10/20/2009	NM	NM	NM	NM	NM	
11/20/2009	NM	NM	NM	NM	NM	
12/5/2009	NM	NM	NM	NM	NM	
1/20/2010	NM	NM	NM	NM	NM	
2/26/2010	NM	NM	NM	NM	NM	
3/16/2010	NM	NM	NM	NM	NM	
4/29/2010	NM	NM	NM	NM	NM	
5/28/2010	NM	NM	NM	NM	NM	

Table A-9
DNAPL EXTRACTION VOLUMES

DATE	THICKNESS OF DNAPL IN WELL (feet)	VOLUME OF DNAPL RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF DNAPL RECOVERED (gallons)	VOLUME OF TOTAL FLUIDS RECOVERED PER EVENT (gallons)	CUMULATIVE VOLUME OF TOTAL FLUIDS RECOVERED (gallons)	COMMENTS
97-5B (cont)						
7/29/2010	NM	NM	NM	NM	NM	
8/31/2010	NM	NM	NM	NM	NM	
9/9/2010	NM	NM	NM	NM	NM	
10/12/2010	NM	NM	NM	NM	NM	
11/29/2010	NM	NM	NM	NM	NM	
12/22/2010	NM	NM	NM	NM	NM	
1/21/2011	NM	NM	NM	NM	NM	
2/23/2011	NM	NM	NM	NM	NM	
3/9/2011	NM	NM	NM	NM	NM	
4/14/2011	NM	NM	NM	NM	NM	
5/16/2011	NM	NM	NM	NM	NM	
6/7/2011	NM	NM	NM	NM	NM	
7/19/2011	NM	NM	NM	NM	NM	
8/23/2011	NM	NM	NM	NM	NM	
9/20/2011	NM	NM	NM	NM	NM	
10/28/2011	NM	NM	NM	NM	NM	
12/2/2011	NM	NM	NM	NM	NM	
2/1/2012	NM	NM	NM	NM	NM	
2/16/2012	NM	NM	NM	NM	NM	
3/14/2012	NM	NM	NM	NM	NM	
4/26/2012	NM	NM	NM	NM	NM	
5/15/2012	NM	NM	NM	NM	NM	
6/27/2012	NM	NM	NM	NM	NM	
7/20/2012	NM	NM	NM	NM	NM	
8/10/2012	NM	NM	NM	NM	NM	
9/19/2012	NM	NM	NM	NM	NM	
11/13/2012	NM	NM	NM	NM	NM	
12/27/2012	NM	NM	NM	NM	NM	
2/25/2013	NM	NM	NM	NM	NM	
3/14/2013	NM	NM	NM	NM	NM	
9/18/2013	NM	NM	NM	NM	NM	
3/7/2014	NM	NM	NM	NM	NM	
9/30/2014	NM	NM	NM	NM	NM	
3/3/2015	NM	NM	NM	NM	NM	
9/14/2015	NM	NM	NM	NM	NM	
3/23/2016	NM	NM	NM	NM	NM	
9/14/2016	NM	NM	NM	NM	NM	
1/4/2017	NM	NM	NM	NM	NM	
2/1/2017	NM	NM	NM	NM	NM	
3/22/2017	NM	NM	NM	NM	NM	
4/13/2017	NM	NM	NM	NM	NM	
5/2/2017	NM	NM	NM	NM	NM	
6/6/2017	NM	NM	NM	NM	NM	
7/19/2017	NM	NM	NM	NM	NM	
8/1/2017	NM	NM	NM	NM	NM	
9/28/2017	NM	NM	NM	NM	NM	
10/26/2017	NM	NM	NM	NM	NM	
11/15/2017	NM	NM	NM	NM	NM	
12/20/2017	NM	NM	NM	NM	NM	
1/10/2018	NM	NM	NM	NM	NM	
2/21/2018	NM	NM	NM	NM	NM	
3/22/2018	NM	NM	NM	NM	NM	
4/17/2018	NM	NM	NM	NM	NM	
5/22/2018	NM	NM	NM	NM	NM	
6/27/2018	NM	NM	NM	NM	NM	
7/17/2018	NM	NM	NM	NM	NM	
8/23/2018	NM	NM	NM	NM	NM	
9/13/2018	NM	NM	NM	NM	NM	
10/24/2018	NM	NM	NM	NM	NM	
11/1/2018	NM	NM	NM	NM	NM	No product, DTB 57.5'
12/20/2018	NM	NM	NM	NM	NM	
1/23/2019	NM	NM	NM	NM	NM	
2/14/2019	NM	NM	NM	NM	NM	
3/21/2019	NM	NM	NM	NM	NM	
4/3/2019	NM	NM	NM	NM	NM	
5/9/2019	NM	NM	NM	NM	NM	
6/20/2019	NM	NM	NM	NM	NM	
7/24/2019	NM	NM	NM	NM	NM	
8/28/2019	NM	NM	NM	NM	NM	
9/25/2019	NM	NM	NM	NM	NM	
10/30/2019	NM	NM	NM	NM	NM	
11/26/2019	NM	NM	NM	NM	NM	
12/26/2019	NM	NM	NM	NM	NM	
1/16/2020	NM	NM	NM	NM	NM	
2/6/2020	NM	NM	NM	NM	NM	
3/25/2020	NM	NM	NM	NM	NM	
4/1/2020	NM	NM	NM	NM	NM	
5/6/2020	NM	NM	NM	NM	NM	
6/18/2020	NM	NM	NM	NM	NM	
7/16/2020	NM	NM	NM	NM	NM	
8/5/2020	NM	NM	NM	NM	NM	
9/9/2020	NM	NM	NM	NM	NM	
9/15/2020	NM	NM	NM	NM	NM	
10/29/2020	NM	NM	NM	NM	NM	
11/23/2020	NM	NM	NM	NM	NM	
12/30/2020	NM	NM	NM	NM	NM	

Notes:
NA = Not Available
NM = Not Measured
ND = Not Detected
DNAPL = Dense non-aqueous phase liquid, a.k.a. product.

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-01												
Date Sampled:	MTCA	MTCA	9/10/98[b]	9/1/1999	9/14/2000	2/7/2002	9/10/2002	3/5/2003	9/11/2003	9/9/2004	9/21/2005	9/27/2006	3/7/2007	6/8/2007	9/19/2007
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C													
TPH (mg/L)															
Diesel	1.0*	0.5*	**3.7**	0.30	**1.3**	0.902	0.778[d]	0.64[g]	0.53[g]	0.66 [g]	0.92 [g]	0.56 [g]	0.41 [i]	0.36 [i]	0.54 [i]
Oil [§]	1.0*	0.5*	0.50 U	0.500 U	0.5	0.500 U	0.500 U	0.5 U	0.073 J	0.22 J	0.48 J	0.52 U	0.50 U	0.52 U	0.25 J
PAHs (ug/L)															
Naphthalene	320 / 700	160 / 350	0.1 UJ	1.0	0.5 U	0.125 U	3.70	0.02 U	0.045	0.026	0.11 U	0.058	0.020 U	0.022 J	0.037
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	NA	0.020 U	0.0068 J	0.015 J	0.11 U	0.16	0.0068 J	0.013 J	0.011 J
Acenaphthylene	NE / NE	NE / NE	0.1 UJ	0.2	0.264	0.0730	0.59 U	0.13	0.14	0.18	0.17	0.071	0.050 J	0.026	0.062
Acenaphthene	960 / 2,100	960 / 2,100	0.1 UJ	19	10.1	3.95	4.84	13	12	11 J	13	3.7	2.5 J	0.022 U	2.9
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	NA	0.81	0.31	0.036	0.11 U	0.27	0.020 U	0.022 U	0.024
Fluorene	640 / 1,400	640 / 1,400	0.1 UJ	2.8	1.66	0.874	1.00	2.8	2	2.6	2.7	1.1	0.56 J	0.022 U	0.47
Phenanthrene	480 / 1,050	NE / NE	0.1 UJ	0.2	0.172	0.125 U	0.579	0.033	0.034	0.045	0.11 U	1.1	0.017 J	0.018 J	0.025
Anthracene	4,800 / 10,500	4,800 / 10,500	0.1 UJ	0.4	0.394	0.223	0.382	0.20	0.3	0.7	0.53	0.41	0.34 J	0.32	0.39
Fluoranthene	640 / 1,400	640 / 1,400	0.1 UJ	0.1	0.375	0.0992	0.295	0.12	0.075	0.13	0.14	0.62	0.036 J	0.036	0.043
Pyrene	480 / 1,050	480 / 1,050	0.1 UJ	0.1	0.328	0.0720	0.189	0.11	0.065	0.13	0.13	0.47	0.085 J	0.043	0.078
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.1 UJ	0.1 U	**0.211**	0.0336	0.0514	0.032	0.0066 J	0.037	0.022 J	**0.18**	0.024 J	0.022 J	0.012 J
Chrysene[1]	0.13 / 0.13	12 / 120	0.1 UJ	0.1 U	**0.223**	0.0380	0.0460	0.036	0.011	0.053	0.029 J	**0.25**	0.023 J	0.020 J	0.0040 J
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.1 UJ	0.1	**0.260**	0.0453	0.0302	0.040	0.0096 U	0.055	0.024 J	**0.23**	0.021 J	0.031	0.022 U
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.1 UJ	0.1 U	**0.172**	0.0339	0.0255	0.024	0.0096 U	0.034	0.017 J	**0.15**	0.013 J	0.0094 J	0.022 U
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.1 UJ	0.1 U	**0.239**	0.0375	0.0274	0.034	0.0096 U	0.043	0.024 J	**0.19**	0.020 J	0.023	0.022 U
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.1 UJ	0.1 U	**0.177**	0.0359	0.0236 U	0.035	0.0096 U	0.038	0.019 J	**0.17**	0.015 J	0.017 J	0.022 U
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.1 UJ	0.1 U	0.2 U	0.0500 U	0.0472 U	0.020 U	0.0096 U	0.0078 J	0.0032 J	0.036	0.020 U	0.0043 J	0.022 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.1 UJ	0.1 U	0.199	0.0428	0.0236 U	0.033	0.0096 U	0.034	0.017 J	0.15	0.013 J	0.019 J	0.022 U
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.5 UJ	0.5 U	0.5 UJ	0.250 U	0.236 U	2.0 U	0.48 UJ	0.96 UJ	1.1 U	1.1 U	0.97 UJ	1.1 U	0.083 J
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals															
Heterotrophic Plate Count (CFU/mL)			29,000	1,600	34,000	715	6,500	91	420	11,000 J	123 J	380,000	51	1,170	186
Hydrocarbon Degrading Bacteria (MPN/100 mL)			91,000	250	20 U	30.0	8.00	1,000 U	20	17,000 J	160,000	140,000	1,000 J	6,500	5,500 J
Nitrate + Nitrite as N (mg/L)			0.02	0.09	0.025 UJ	0.0456	0.0168	0.2 U	0.2 UJ	0.2 U	0.2	0.13	0.22	1.9	0.12
Phosphorus, Total (mg/L)			1.6	0.69	1.6	0.181	0.157	0.99	1	1.17	1.19	1.07	0.64	0.09	0.73
Sulfate as SO4 (mg/L)			18	150	167 J	207	216	215	256	252	242	243	251	239	247
Total Organic Carbon (TOC) (mg/L)			16	7.9	21.6	8.04	8.63	9	8.5	9.8	9.8	13.6	9.5	6.5	9.2

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-01 (continued)												
Date Sampled:	MTCA	MTCA	9/25/2008	9/22/2009	9/9/2010	9/21/2011	9/20/2012	9/17/2013	9/29/2014	9/14/2015	9/15/2016	9/27/2017	9/13/2018	9/24/2019	9/14/2020
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C													
TPH (mg/L)															
Diesel	1.0*	0.5*	0.26 U	0.34 g	0.47 g	**0.52 g**	**0.61 g**	**0.64 g**	**0.86 g**	**0.81 g**	**1.0 g**	**0.67 J g**	**0.77 g**	**0.77 g**	**0.66 g**
Oil §	1.0*	0.5*	0.52 U	0.53 U	0.55 U	0.55 U	0.53 U	0.34 J	**0.67** h	0.49 h	0.54 U	0.50 U	0.55 U	0.54 U	0.50 U
PAHs (ug/L)															
Naphthalene	320 / 700	160 / 350	0.019 J	0.0078	0.064	0.012 J	0.030 J	0.035 J	0.051	0.016 J	0.048 J	1.0 U	0.021 J	0.011	0.016
2-Methylnaphthalene	32 / 70	32 / 70	0.0065 J	0.0038 U	0.024	0.0036	0.0048 J	0.0082	0.0078	0.0059	0.0070	0.60 U	0.0050	0.0036	0.0042 J
Acenaphthylene	NE / NE	NE / NE	0.022	0.0089	0.027	0.015	0.014	0.024 J	0.031	0.013	0.023	0.014 J	0.0080 J	0.0083	0.011
Acenaphthene	960 / 2,100	960 / 2,100	0.18	0.0036 U	4.2	1.1	0.400	1.4	3.1	1.1	2.2 J	0.94	0.091	0.49	0.87
Dibenzofuran	64 / 140	16 / 35	0.024	0.0028 J	0.012	0.0036 U	0.0036 U	0.0035 UJ	0.0017 J	0.014	0.026	0.0060 J	0.0015 J	0.0024 J	0.0034 U
Fluorene	640 / 1,400	640 / 1,400	0.054	0.011	0.27	0.027	0.013 J	0.017 J	0.019	0.018	0.017	0.019 J	0.0085 J	0.0091 J	0.010 J
Phenanthrene	480 / 1,050	NE / NE	0.011 J	0.0036 U	0.0097 U	0.006 U	0.0036 U	0.0088 J	0.0034 U	0.0060 J	0.0034 U	1.0 U	0.0034 U	0.0033 U	0.0063 J
Anthracene	4,800 / 10,500	4,800 / 10,500	0.24	0.23	0.10	0.14	0.18	0.23	0.22	0.12	0.22	0.22 J	0.13	0.11	0.17
Fluoranthene	640 / 1,400	640 / 1,400	0.024	0.0044	0.0078	0.0047	0.0039 J	0.0041	0.0056 J+	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Pyrene	480 / 1,050	480 / 1,050	0.077	0.027	0.069	0.063	0.056	0.083	0.099	0.059	0.064 J	1.0 U	0.060	0.048	0.055
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.015 J	0.0027 J	0.0035 J	0.0036 U	0.0026 J	0.0045	0.0068	0.0040 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Chrysene[1]	0.13 / 0.13	12 / 120	0.010 J	0.00081 J	0.0038	0.0036 U	0.0016 J	0.0044	0.0080	0.0034 U	0.0034 U	1.0 U	0.0034 U	0.0033 U	0.0034 U
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.018 J	0.0031 J	0.002 J	0.0021 J	0.0036 U	0.0048	0.0088	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.0075 J	0.0012 J	0.0037 U	0.0036 U	0.0036 U	0.0017 J	0.0025 J	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.017 J	0.0021 J	0.0013 J	0.0013 J	0.0036 U	0.0034 J	0.0064	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.012 J	0.0022 J	0.0014 J	0.00072 J	0.0036 U	0.0027 J	0.0049	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.020 U	0.00068 J	0.0037 U	0.0036 U	0.0036 U	0.00061 J	0.0012 J	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.012 J	0.0036 U	0.001 J	0.00079 J	0.0036 U	0.0026 J	0.0052 J+	0.0034 U	0.0034 U	0.60 U	0.0034 U	0.0033 U	0.0034 U
Pentachlorophenol §	0.729 / 7.29	0.219 / 2.19	0.23 J	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
TTEC[1]	NE / NE	0.012 / 0.12	0.022	0.003	0.002	0.0016	0.0003	0.0049	0.0089	NA	NA	NA	NA	NA	NA
Conventionals															
Heterotrophic Plate Count (CFU/mL)			117	1,900 J	8.00 J	29.0	15.0	121	1.00	2.00	0.50 U	1.50	6.50	336	11.5
Hydrocarbon Degrading Bacteria (MPN/100 mL)			5,500 J	8,000,000 J	4,500 J	200 U	900 UJ	24,500	1,000	1,000	900 U	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.10	0.027 J	0.086	0.085	0.117	0.076	0.050 U	0.052 J	0.050 U	0.079	0.040 J	0.021 J	0.050 U
Phosphorus, Total (mg/L)			0.29	0.028	0.755	0.647	1.13	1.35	1.34	1.66	1.88	1.39	1.56	1.40 J	1.74
Sulfate as SO4 (mg/L)			267	231	267	258	248	192	128	108	86.8	45.9	35.1	27.1	12.9
Total Organic Carbon (TOC) (mg/L)			8.50	6.77	9.50	8.20	8.21	8.92	8.3	9.2	10.0	11.5	10.3	14.5	16.0

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID: / Date Sampled: / QAQC:	Cleanup Level Through 2007 MTCA Mtd B / Mtd C	Cleanup Level Current (2017) MTCA Mtd B / Mtd C	AV-02																					
			9/10/1998	9/14/2000	2/7/2002	9/10/2002	3/5/2003	9/11/2003	9/9/2004	9/21/2005	9/27/2006	9/20/2007	9/23/2008	9/22/2009	9/9/2010	9/21/2011	9/20/2012	9/17/2013	9/29/2014	9/14/2015	9/15/2016	9/27/2017	9/13/2018	9/24/2019	9/14/2020
TPH (mg/L)																								
Diesel	1.0*	0.5*	**11**	**4.05**	0.834	**4.73**[d]	**1.0**[g]	**7.1**[g]	**6.7**[g]	**19**[g]	**13**[g]	**21**[g]	**14**[g]	**12**[g]	**38**[g]	**6.5**[g]	**9.5**[g]	**13**[g]	**24**[g] J	**24**[g]	**34**[g]	**7.8 J**[g]	**19**[g]	**18**[g]	**16**[g]
Oil [§]	1.0*	0.5*	0.50 U	**1.15**	0.500 U	0.686[e]	0.5 U	0.76[h]	**1.3**[h]	**2.6**[h]	**1.5**[h]	**2.0**[h]	**1.2**[h]	**1.1**[h]	**6.2**[h]	2.3 U	**1.3**[h]	**2.6**[h]	**7.3**[h] J	**6.3**[h]	**6.8**[h]	**2.5**[k]	**2.8**[h]	**2.3**[h]	**3.7**
PAHs (ug/L)																								
Naphthalene	320 / 700	160 / 350	**3,140 J**	1.01	0.389	4.12	0.100	3.2	1.6	13	58	62 J	46	28	42	17	13	40	61	97	180 J	76	77	110	100
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	0.020 U	0.29	0.39	0.64	1.8	4.3 J	0.94	1.7	1.4	0.21	0.11 J	1.0	4.1	15	17	0.66 J	0.33	8.0	9.1 J
Acenaphthylene	NE / NE	NE / NE	11.6 J	1.26	0.148	0.673	0.23	0.77	0.096 U	3.2 J	2.3	2.3 J	1.3	0.71	0.78	0.33	0.29 J	0.59 J	1.1	0.60	1.1	0.37 J	0.30	0.37	0.63 J
Acenaphthene	960 / 2,100	960 / 2,100	791 J	1.0 U	7.07	9.97	15	16	19	54	43	37 J	25	29	61	19	19	28	34	37	48 J	15	23	29	38
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	30	21	24	47	33	33 J	24	23	**51**	15	15	17	24	26	31	9.0	8.9	18	17
Fluorene	640 / 1,400	640 / 1,400	728 J	1.0 U	6.47	5.89	14	11	14	30	27	21 J	17	16	19	15	17	17	26	20	27	10	9.1	9.4	16
Phenanthrene	480 / 1,050	NE / NE	1,020 J	0.344	0.352	0.679	0.077	0.34	0.58	0.72	1.3	0.71 J	0.19 U	0.12	0.32	0.11 U	0.017 U	0.18 J	0.018 U	0.14	0.26	0.15 J	0.22	0.27	0.48
Anthracene	4,800 / 10,500	4,800 / 10,500	259 J	2.3	0.989	1.93	1.6	3.2	5.6 J	7.4	5.8	5.7 J	4.1	2.5	3.1	2.5	2.9	3.6	3.7	3.0	3.9	2.3 J	2.3	2.5	3.8
Fluoranthene	640 / 1,400	640 / 1,400	663 J	1.24	0.891	2.87	2.6	3.5	4.5 J	8.5	6.8	5.3 J	6.1	3.1	4.0	3.5	4.6	4.9	4.2	4.7	4.3	2.6 J	3.4	3.1	4.9
Pyrene	480 / 1,050	480 / 1,050	754 J	1.59	0.352	1.01	1.2	1.8	2.7	4.5	4.1	2.8 J	2.3	1.6	2.1	1.9	2.6	2.6	3.1	2.3	1.9 J	1.5 J	2.0	1.6	2.4
Benzo[a]anthracene [1]	0.13 / 0.13	0.12 / 1.2	**187 J**	**1.34**	0.0588	**0.223**	0.12	**0.23**	**0.52**	**0.74**	**0.57**	**0.31 J**	0.18	0.19	0.25	0.16	0.21	0.24	0.27	0.21	0.23	0.13 J	0.21	0.15	0.27
Chrysene [1]	0.13 / 0.13	12 / 120	**162 J**	**1.85**	0.0710	**0.254**	**0.15**	**0.30**	**0.64**	**0.81**	**0.73**	**0.28 J**	0.20	0.16	0.11	0.086	0.22	0.14	0.11	0.14	0.19	0.11 J	0.11	0.14	0.13
Benzo[b]fluoranthene [1]	0.13 / 0.13	0.12 / 1.2	**104 J**	**3.73**	**0.238**	**0.255**	0.11	**0.16**	**0.65**	**1.7**	**0.55**	**0.36 J**	0.11	0.16	0.16	0.11	0.14	0.16	0.15	0.16	0.13 J	0.058 J	0.12	0.10	0.14
Benzo[k]fluoranthene [1]	0.13 / 0.13	1.2 / 12	**36.9 J**	**1.56**	0.0250 U	0.238 U	0.041	0.099	**0.26**	0.52 U	**0.25**	0.099 U	0.10 U	0.0034 U	0.049	0.041	0.037	0.061	0.041	0.033 J	0.17 U	0.015 J	0.025	0.016 J	0.029 J
Benzo[a]pyrene [1]	0.13 / 0.13	0.012 / 0.12	**53.2 J**	**3.54**	0.101	0.238 U	0.083	**0.15**	**0.48**	**0.74**	**0.31**	**0.17 J**	0.10 U	0.087	**0.12**	0.072	0.10	**0.12**	0.11	0.10	0.11 J	0.057 J	0.085	0.062	0.11
Indeno[1,2,3-cd]pyrene [1]	0.13 / 0.13	0.12 / 1.2	**14.6 J**	**3.53**	**0.145**	0.238 U	0.069	0.11	**0.50**	**0.80**	**0.31**	**0.17 J**	0.059 J	0.042	0.078	0.037	0.052	0.079	0.057	0.045	0.066 J	0.025 J	0.036	0.032	0.049
Dibenzo[a,h]anthracene [1]	0.13 / 0.13	0.012 / 0.12	10.0 UJ	**1.08**	0.0500 U	0.476 U	0.020 U	0.039 J	0.11	**0.15 J**	0.059 J	0.026 J	0.10 UJ	0.0072	0.014 J	0.011 J	0.0083 J	0.015 J	0.0090 J	0.011 J	0.17 U	6.0 U	0.0066 J	0.0054 J	0.011 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	14.2 J	3.17	0.143	0.238 U	0.048	0.083	0.38	0.59	0.23	0.12 J	0.044 J	0.029	0.055	0.029	0.041	0.056	0.047	0.043	0.049 J	0.021 J	0.034	0.021	0.034 J
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	**373 J**	**17.2** J	0.569	5.95 U	2.0 U	2.5 UJ	3.6 J	110 U	2.0 J	1.9 J	50 UJ	0.50 U	0.23 J	0.28 J	0.50 U	0.50 U	0.74 UJ	0.25 U	**7.9**	0.25 U	0.25 U	0.65	0.20 J
TTEC [1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.157**	**0.129**	**0.176**	0.1088	**0.147**	**0.18**	**0.16**	**0.15**	**0.15**	0.081	**0.13**	0.094	0.161
Conventionals													0.157	0.129											
Heterotrophic Plate Count (CFU/mL)			35,000	121,000	3,800	2,210	136	260	12,200 J	660 J	11,400	17,000	455 J	81.5 J	472 J	24.0	194	50.5	48.5	7.50	0.50 U	8.00	2.00	0.50	1.50
Hydrocarbon Degrading Bacteria (MPN/100 mL)			110,000	40	900	23.0	3,500	20	21,000 J	17,000	170,000	8,500 J	40,000 J	≥ 8,000,000 J	110,000 J	400	900 UJ	1,000	3,900	900 U	900 U	900 U	900 U	900 U	900
Nitrate + Nitrite as N (mg/L)			0.02	0.439	0.00500 U	0.00500 U	0.2 U	0.2 UJ	0.2 U	0.15	0.15	0.09	0.14	0.082	0.073	0.054	0.089	0.065	0.050 U	0.028 J	0.025 J	0.075	0.020 J	0.076	0.152 J
Phosphorus, Total (mg/L)			0.01 U	0.824	0.278	0.225	0.53	0.76	1.28	1.33	2.17	0.84	0.91	0.935	1.100	0.697	0.937	0.750	0.863	0.870	0.884	0.733	0.749	0.655	0.76
Sulfate as SO4 (mg/L)			14	82.5 J	312	102	249	51	42.1	23.7	40.1	20.3	26.3	15.2	1.10	15.8	9.62	3.75	0.46	0.38	3.59	2.5	14.1	4.33	1.04
Total Organic Carbon (TOC) (mg/L)			32	78.1	9.36	39.3	15	60.3	51.2	93	104	108	17.5	101	115	43.8	48.7	57.0	68.4	78.5	101	45	75	75	93.6

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-03								
Date Sampled:	MTCA	MTCA	9/10/98[b]	9/1/99[c]	9/14/2000	2/7/2002	9/10/2002	3/5/2003	9/11/2003	9/9/2004	9/21/2005
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C									
TPH (mg/L)											
Diesel	1.0*	0.5*	**30**	0.75	**1.25**	0.940	**1.77**[d]	0.59[g]	0.6 [g]	**1.0** [g]	**1.3** [g]
Oil [§]	1.0*	0.5*	0.50 U	0.50 U	0.888	0.500 U	0.500 U	0.5 U	0.12 J	0.46 J	0.52 [h]
PAHs (ug/L)											
Naphthalene	320 / 700	160 / 350	**6,700 J**	0.1 U	0.284	0.0292	16.4	0.022	0.05	0.16	0.18 J
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	NA	0.020 U	0.036	0.13	0.10 J
Acenaphthylene	NE / NE	NE / NE	10.0 UJ	0.1 U	0.128	0.0248 U	0.604 U	0.041	0.08	0.15	0.11 J
Acenaphthene	960 / 2,100	960 / 2,100	203 J	0.1 U	0.201	0.0248 U	2.59	0.020 U	0.027	0.047	0.082 J
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	NA	0.41	0.33	0.26	0.17
Fluorene	640 / 1,400	640 / 1,400	80 J	0.1	0.179	0.0875	2.26	0.10	0.095	0.094	0.10 J
Phenanthrene	480 / 1,050	NE / NE	41 J	0.1	0.551	0.0624	4.15	0.059	0.034	0.12	0.27
Anthracene	4,800 / 10,500	4,800 / 10,500	10.0 UJ	0.2	0.620	0.161	0.839	0.24	0.38	1.2	0.90
Fluoranthene	640 / 1,400	640 / 1,400	10.0 UJ	0.1	0.773	0.0795	1.40	0.041	0.031	0.27	0.44
Pyrene	480 / 1,050	480 / 1,050	10.0 UJ	0.1	0.679	0.0607	0.564	0.035	0.017	0.21	0.35
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	10.0 UJ	0.1 U	**0.272**	0.0279	**0.149**	0.020 U	0.0096 U	0.068	0.091 J
Chrysene[1]	0.13 / 0.13	12 / 120	10.0 UJ	0.1 U	**0.300**	0.0315	0.129	0.020 U	0.0096 U	0.091	**0.13**
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	10.0 UJ	0.1 U	**0.341**	0.0840	0.106	0.020 U	0.0096 U	0.080	**0.19**
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	10.0 UJ	0.1 U	**0.252**	0.0248 U	0.0845	0.020 U	0.0096 U	0.062	0.11 U
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	10.0 UJ	0.1 U	**0.322**	0.0320	0.0626	0.020 U	0.0096 U	0.067	0.076 J
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	10.0 UJ	0.1 U	**0.254**	0.0306	0.0242 U	0.020 U	0.0096 U	0.063	0.082 J
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	10.0 UJ	0.1 U	0.200 U	0.0495 U	0.0483 U	0.020 U	0.0096 U	0.011 J	0.012 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	10.0 UJ	0.1 U	0.286	0.0374	0.0242 U	0.020 U	0.0096 U	0.054	0.078 J
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	**13,500 J**	1.2	4.7 J	**9.21**	**14.6**	**27**	**39 J**	**33 J**	**29 J**
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals											
Heterotrophic Plate Count (CFU/mL)			1,200	20,000	630,000	5,250	1,180	34	220	207,000 J	19,800 J
Hydrocarbon Degrading Bacteria (MPN/100 mL)			1,000 U	9,400	1,100	1,100	8.00	4,000	20 U	27,000 J	500,000
Nitrate + Nitrite as N (mg/L)			0.03	15	19.3	0.619	22.8	2.0	0.03 J	0.2 U	0.029 J
Phosphorus, Total (mg/L)			0.01 U	0.83	0.15	0.0734	0.0496	0.03	0.11	0.22	0.49
Sulfate as SO4 (mg/L)			72	75	64.9 J	59.7	66.0	51	67	54.9	58.1
Total Organic Carbon (TOC) (mg/L)			83	13	31.3	7.76	12.7	9	3.6	11.8	13

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.
TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.
PCMP Wells: 97-6A, 04-6A, and 97-6B.
MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-04									
Date Sampled:	MTCA	MTCA	9/10/1998[b]	9/10/1998	9/1/1999	9/14/2000	2/7/2002	9/10/2002	3/6/2003	9/11/2003	9/9/2004	9/21/2005
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field Dup								
TPH (mg/L)												
Diesel	1.0*	0.5*	**11**	**6.6**	0.87	**2.18**	0.649	**2.17**[d]	0.71[g]	**2.0**[g]	**1.4**[g]	**4.5**[g]
Oil[§]	1.0*	0.5*	0.50 U	0.50 U	0.50 U	0.824	0.500 U	0.577[c]	0.5 U	0.39 J	0.47 J	**1.3**[h]
PAHs (ug/L)												
Naphthalene	320 / 700	160 / 350	**1,100** J	10.1 J	1.0 U	1.13	1.54	7.55	1.1	1.1	0.36	1.7
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	NA	NA	0.30	0.09	0.14	0.55
Acenaphthylene	NE / NE	NE / NE	3.9 J	10.0 UJ	1.5	1.43	0.0762	0.880	0.26	1.2	1.2	2.5
Acenaphthene	960 / 2,100	960 / 2,100	484 J	581 J	61.3	22.9	0.904	15.7	8.00	56	20 J	58
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	NA	NA	14	46	17 J	40
Fluorene	640 / 1,400	640 / 1,400	246 J	315 J	18.5	14.3	0.819	5.56	3.5	31	15 J	36
Phenanthrene	480 / 1,050	NE / NE	141 J	129 J	6.2	17.4	1.19	3.63	0.25	1.2	1.1	3.4
Anthracene	4,800 / 10,500	4,800 / 10,500	27.1 J	23.3 J	6.5	17.5	2.88	2.41	0.91	3	4.6	9.1
Fluoranthene	640 / 1,400	640 / 1,400	18.9 J	20.1 J	23.3	32.5	0.731	2.27	0.87	3.1	2.8	8.5
Pyrene	480 / 1,050	480 / 1,050	21.3 J	23.6 J	15.6	20.9	0.405	1.16	0.38	1.6	1.8	5.0
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	**1.6 J**	10.0 UJ	**8.6**	**11.5**	**0.244**	**0.291**	0.051	**0.31**	**0.40**	**1.4**
Chrysene[1]	0.13 / 0.13	12 / 120	**1.1 J**	10.0 UJ	**10.9**	**11.1**	**0.853**	**0.291**	0.062	**0.30**	**0.65**	**1.7**
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	1.0 UJ	10.0 UJ	**7.9**	**7.05**	**0.360**	0.240 U	0.040	**0.24**	**0.62**	**1.4**
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	1.0 UJ	10.0 UJ	**2.8**	**5.13**	0.0260 U	0.240 U	0.020 U	0.10	0.02 U	**0.74**
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	1.0 UJ	10.0 UJ	**5.0**	**5.75**	**0.167**	0.240 U	0.030	**0.13**	**0.30**	**1.2**
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	1.0 UJ	10.0 UJ	**2.0**	**3.09**	**0.165**	0.240 U	0.023	0.04	**0.34**	**1.1**
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	1.0 UJ	10.0 UJ	1.0 U	2.5 U	0.0648	0.481 U	0.020 U	0.0076 UJ	0.086	**0.24 J**
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	1.0 UJ	10.0 UJ	1.8	2.75	0.161	0.240 U	0.020 U	0.024	0.28	0.89
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	6.8 J	50.0 UJ	5.0 U	4.41 J	1.03	2.40 U	2.00 U	0.13 J	0.32 J	4.9 U
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals												
Heterotrophic Plate Count (CFU/mL)			3,000,000	1,100,000	31,000	126,000	9,550	820	112	500	20,600 J	4,100
Hydrocarbon Degrading Bacteria (MPN/100 mL)			3,700	NA	14,000	24,000	3,000	30.0	1,000 U	40	11,000 J	≥1,600,000
Nitrate + Nitrite as N (mg/L)			0.04	0.05	1.1	1.74	0.0793	0.0157	0.2 U	0.06 J	0.2 U	0.12
Phosphorus, Total (mg/L)			0.01 U	0.01	0.58	0.771	0.262	0.121	0.15	0.22	0.79	1.1
Sulfate as SO4 (mg/L)			38	53	150	172 J	173	95.7	77	69	41.1	46.7
Total Organic Carbon (TOC) (mg/L)			35	33	7.4	19	9.38	19.0	13.6	29.4	23.3	44

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-05							
Date Sampled:	MTCA	MTCA	9/10/1998[b]	9/1/1999	9/14/2000	2/7/2002	3/6/2003	9/11/2003	9/9/2004	9/21/2005
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C								
TPH (mg/L)										
Diesel	1.0*	0.5*	**11**	**3.6**	0.525	0.250 U	0.25 U	0.16 J	0.099 J	0.27 [i]
Oil [§]	1.0*	0.5*	0.50 U	0.50 U	0.588 U	0.500 U	0.5 U	0.074 J	0.13 J	0.50 U
PAHs (ug/L)										
Naphthalene	320 / 700	160 / 350	**2,120** J	5.1	4.31	0.0247 U	0.037	0.093	0.058	0.15
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	0.039	0.19	0.042	0.082 J
Acenaphthylene	NE / NE	NE / NE	10.0 U	4.7	1 U	0.0277	0.021	0.056	0.28	0.36
Acenaphthene	960 / 2,100	960 / 2,100	674 J	170	23.4	0.218	0.53	2.2	0.15	0.24
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	0.96	3.7	0.28	0.21
Fluorene	640 / 1,400	640 / 1,400	342 J	125	5.57	0.106	0.35	2.0	0.39	0.60
Phenanthrene	480 / 1,050	NE / NE	167 J	124	2.27	0.0736	0.22	2.7	0.19	0.44
Anthracene	4,800 / 10,500	4,800 / 10,500	14.9 J	70	3.37	0.0696	0.14	0.63	1.0	0.93
Fluoranthene	640 / 1,400	640 / 1,400	16.8 J	109	10	0.120	0.41	2.0	0.45	0.75
Pyrene	480 / 1,050	480 / 1,050	19.6 J	68.9	7.81	0.0868	0.19	1.0	0.33	1.0
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	10.0 UJ	**36.3**	**4.46**	0.0511	0.038	0.068	**0.24**	**0.56**
Chrysene[l]	0.13 / 0.13	12 / 120	10.0 UJ	**38.9**	**6.36**	0.0952	0.066	0.091	**0.61**	**1.5**
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	10.0 UJ	**28.2**	**3.78**	**0.201**	0.051	0.027	**0.61**	**1.4**
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	10.0 UJ	**10.2**	**2.79**	0.0247 U	0.028	0.024	**0.37**	**0.71**
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	10.0 UJ	**17**	**3.39**	0.0818	0.042	0.019	**0.54**	**1.3**
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	10.0 UJ	**5.6**	**2.07**	0.0956	0.038	0.012 U	**0.52**	**1.2**
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	10.0 UJ	**2.3**	2 U	0.0494 U	0.02 U	0.0029 UJ	0.12	**0.34**
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	10.0 UJ	5.1	1.91	0.0955	0.031	0.008 UJ	0.41	0.93
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	50.0 U	5.0 U	0.816 J	0.247 U	2.0 U	0.49 UJ	0.13 J	1.1 U
TTEC[l]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals										
Heterotrophic Plate Count (CFU/mL)			95,000	32,000	13,500	4,550	38	230	416,000 J	3,750 J
Hydrocarbon Degrading Bacteria (MPN/100 mL)			45,000	8,300	230	2,400	1,000 U	70	80,000 J	160,000
Nitrate + Nitrite as N (mg/L)			0.07	1.4	0.406	7.97	0.9	8 J	0.2	0.09
Phosphorus, Total (mg/L)			0.01 U	0.39	0.427	0.189	0.19	0.02	1.06	1.14
Sulfate as SO4 (mg/L)			140	140	153 J	193	172	123	117	107
Total Organic Carbon (TOC) (mg/L)			18	22	6.24	4.93	4.1	9.3	3.9	3.6

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[l] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-06												AV-07									
Date Sampled:	MTCA	MTCA	3/6/2003	9/10/2004	9/20/2007	9/21/2011	9/20/2012	9/29/2014	9/14/2015	9/15/2016	9/27/2017	9/13/2018	9/24/2019	9/14/2020	9/10/1998	9/14/2000	2/7/2002	2/7/2002 Field Dup	9/10/2002	9/10/2002 Field Dup	3/6/2003	9/11/2003	9/9/2004	9/21/2005
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																						
TPH (mg/L)																								
Diesel	1.0*	0.5*	**160** [g]	**140** [g]	NA	**17** [g]	**18** [g]	**19** [g] J	**18** [g]	NA	**17 J** [g]	**14** [g]	**13** [g]	**5.9** [g]	**14**	**1.62**	**1.20**	**1.20**	**1.42** [d]	**1.73** [d]	**1.1** [g]	**1.5** [g]	**1.6** [g]	**3.2** [g]
Oil [k]	1.0*	0.5*	**41** [h]	**13** [h]	NA	**2.7** [h]	**2.6** [h]	**6.8** [h] J	**5.5** [h]	NA	**3.7** [h]	**3.5** [h]	**2.2** [h]	**1.5 J**	1.0 U	0.772	0.500 U	0.500 U	0.500 U	0.5 U	0.5 U	0.28 J	0.4 J	**1.0** [h]
PAHs (ug/L)																								
Naphthalene	320 / 700	160 / 350	**12,000**	**1,800**	4.5 J	100	1.8 J	25 J	2.6	NA	**540**	**540**	160	30	10.0 UJ	0.579	0.408	0.416	3.47	7.63	0.69	3.8	3.3	3.0
2-Methylnaphthalene	32 / 70	32 / 70	**8,600**	**1,800**	2.9 J	1.1 J	0.25 J	0.64	0.30	NA	**74 J**	**90**	11	19 J	NA	NA	NA	NA	NA	NA	1.4	1.9	1.3	0.59
Acenaphthylene	NE / NE	NE / NE	60	35	21 J	2.2	1.4 J	2.7	0.75	NA	1.5 J	1.6	1.2	0.91	10.0 UJ	0.788	0.986	0.946	2.87	0.531	0.25	0.6	1.1	1.4
Acenaphthene	960 / 2,100	960 / 2,100	**4,600**	1,100	0.95 U	31	34	38	14	NA	49 J	53	27	25	495 J	7.25	0.443	5.92	14.0	10.6	15	22	21 J	45
Dibenzofuran	64 / 140	16 / 35	**3,000**	**780**	0.23 U	9.5	7.6	8.8	1.2	NA	19	28	7.3	10	NA	NA	NA	NA	NA	NA	25	53	23 J	56
Fluorene	640 / 1,400	640 / 1,400	**3,600**	840	1.9 J	14	9.7	13	1.4	NA	21	30	9.3	11	224 J	3.68	0.0667	1.42	3.33	4.77	11	21	18 J	37
Phenanthrene	480 / 1,050	NE / NE	**5,500**	**1,200**	0.81 J	1.5 J	0.44 J	0.017 U	0.33	NA	17 J	21	2.2	6.6	90.3 J	1.03	0.100	0.134	0.590	1.83	4.1	1.7	1.5	1.1
Anthracene	4,800 / 10,500	4,800 / 10,500	1,200	250	5.7 J	3.8	2.9	4.4	1.1	NA	3.7 J	5.8	3.1	3.0	10.0 UJ	2.35	0.274	0.489	1.65	1.94	2.0	3.0	5.5	5.3
Fluoranthene	640 / 1,400	640 / 1,400	**2,600**	450	23 J	11	7.6	8.7	12	NA	8.5 J	11	8.5	6.8	10.0 UJ	5.06	0.968	1.40	2.22	1.8	2.7	2.8	3.2	4.8
Pyrene	480 / 1,050	480 / 1,050	**1,700**	310	19 J	7.9	5.3	7.0	8.1	NA	5.8 J	7.9	5.6	4.6	10.0 UJ	3.76	0.644	0.776	0.899	1.05	1.4	1.5	2.0	3.9
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	**580**	**96**	**3.7 J**	**1.8 J**	0.97	**1.4**	**1.9**	NA	1.1 J	**1.7**	**1.8**	**1.2**	10.0 UJ	**1.94**	0.117	**0.159**	**0.198**	**0.179**	**0.17**	**0.17**	**0.19**	**0.54**
Chrysene[l]	0.13 / 0.13	12 / 120	**550**	**100**	**3.3 J**	1.6 J	1.1 J	1.0	2.0	NA	1.0 J	1.7	1.8	0.95	10.0 UJ	**1.92**	**0.132**	**0.172**	**0.197**	**0.176**	**0.19**	**0.21**	**0.26**	**0.65**
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	**260**	**45**	**3.2 J**	**2.1 J**	1.1 J	**1.2**	**1.4**	NA	0.82 J	**1.6**	**2.6**	0.88	10.0 UJ	**1.71**	0.109	**0.216**	0.590 U	0.118 U	0.065	0.086	**0.21**	**0.39** J
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	**200**	**37**	**1.6 J**	0.65	0.34 J	0.32	0.48	NA	0.26 J	0.47	0.7	0.24	10.0 UJ	**0.915**	0.0713	0.0258 U	0.590 U	0.118 U	0.034	0.045	0.020 U	**0.18** J
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	**210**	**35**	**1.2 J**	**0.98 J**	**0.64 J**	**0.67**	**0.82**	NA	**0.48 J**	**0.96**	**1.5**	**0.55**	10.0 UJ	**1.30**	0.0921	0.0862	0.590 U	0.118 U	0.043	0.046	0.083	**0.25** J
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	**74**	**14**	**0.6 J**	0.53 J	0.29 J	0.31	0.26	NA	0.20 J	0.41	0.81	0.21	10.0 UJ	**0.641**	0.0690	0.0628	0.590 U	0.118 U	0.020 U	0.025	0.061	**0.15** J
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	**19**	**4.6**	**0.19 J**	**0.15**	0.064 J	0.070	0.078	NA	0.035 J	0.092	**0.17**	**0.043**	10.0 UJ	**0.277**	0.0510 U	0.0515 U	1.18 U	0.236 U	0.020 U	0.01 U	0.0087 J	0.045 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	50	11	0.46 J	0.39	0.24 J	0.25	0.26	NA	0.14 J	0.38	0.57	0.14	10.0 UJ	0.637	0.0772	0.0691	0.590 U	0.118 U	0.020 U	0.02 U	0.058	0.11 J
Pentachlorophenol [k]	0.729 / 7.29	0.219 / 2.19	**5,000**	**3,400 J**	**2,200 J**	**51**	**47**	0.42 J	0.30	0.12 J	0.25 U	1.3 U	0.25 U	0.11 J	**390 J**	**14.9**	3.18	3.05	5.90 U	2.62	2.9	0.94 J	0.75 J	5.0 U
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	**1.52**	**0.927**	**1.0**	**1.3**	NA	**0.73**	**1.4**	**2.1**	**0.82**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals																								
Heterotrophic Plate Count (CFU/mL)			391	179	NA	229	1,400	26.0	>608	117	3.00	350	365	400	42,000	91,000	10,500	7,500	7,550	450	71	550	426,000 J	3,300 J
Hydrocarbon Degrading Bacteria (MPN/100 mL)			1,000 U	1,600,000	NA	28,000	900 UJ	23,000	6,500	16,500	35,000	270,000	175,000	55,000	110,000	5,000	900	1,700	1,600	30	1,000 U	5,000	900,000 J	160,000
Nitrate + Nitrite as N (mg/L)			0.2 U	0.2 U	NA	0.050 U	0.045 J	0.050 U	0.031 J	0.025 J	0.088 J	0.050 U	0.292	0.050 U	0.01	0.0385	0.00670	0.00500 U	0.170	0.587	0.2 U	0.08 J	0.2 U	0.039 J
Phosphorus, Total (mg/L)			1.94	1.31	NA	1.03	0.992	0.767	1.75	1.31	1.29	0.609	0.977	1.10	0.01 U	0.874	0.294	0.333	0.259	0.3	0.46	0.44	0.48	0.56
Sulfate as SO4 (mg/L)			33	11.2	NA	5.0	2.4	3.4	3.8	17.4	5.9	9.02	4.13	1.72	58	68.8 J	98.9	101	97.8	89.7	77	77	58.8	55.9
Total Organic Carbon (TOC) (mg/L)			126	169	NA	79	60.2	54	61.7	53	59.4	42	47.8	56.0	27	20.8	9.90	9.34	15.4	17	13.9	21.1	23.7	26

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007 MTCA	Cleanup Level Current (2017) MTCA	AV-08												
Date Sampled:	Mtd B / Mtd C	Mtd B / Mtd C	9/10/1998	9/14/2000	9/14/2000 Field Dup	2/7/2002	9/10/2002	3/6/2003	9/11/2003	9/9/2004	9/21/2005	9/27/2006	3/7/2007	6/8/2007	9/19/2007	12/19/2007
QAQC:																
TPH (mg/L)																
Diesel	1.0*	0.5*	0.63	0.256	0.25 U	0.294 U	0.250 U	0.25 U	0.23 J	0.35 [i]	0.51 [i]	0.54 [i]	0.33 [i]	0.33 [i]	**1.6** [§]	0.59 [i]
Oil [§]	1.0*	0.5*	0.50 U	0.5 U	0.5 U	0.588 U	0.500 U	0.5 U	0.077 J	0.22 J	0.50 U	0.50 U	0.52 U	0.52 U	0.15 J	0.52 U
PAHs (ug/L)																
Naphthalene	320 / 700	160 / 350	3.4 J	0.109	0.1 U	0.0263 U	3.70	0.020 U	0.7	0.015 U	12	26	0.020 U	0.091	83	NA
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	NA	0.020 U	0.015	0.03	0.16	0.31	0.022 J	0.013 J	0.59	NA
Acenaphthylene	NE / NE	NE / NE	1.0 UJ	0.1 U	0.1 U	0.0263 U	0.0248	0.020 U	0.013	0.0065 J	0.088 J	0.14	0.019 J	0.017 J	0.50	NA
Acenaphthene	960 / 2,100	960 / 2,100	46.4 J	0.155	0.12	0.0263 U	0.336	0.020 U	0.11	0.018 J	4.2	5.3	0.0044 J	0.020 U	23	NA
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	NA	0.020 U	0.03	0.013 J	0.11 J	0.31	0.020 U	0.020 U	1.1	NA
Fluorene	640 / 1,400	640 / 1,400	17.2 J	0.129	0.1	0.0263 U	0.284	0.020 U	0.018	0.021	0.095 J	0.46	0.014 J	0.020 U	0.14	NA
Phenanthrene	480 / 1,050	NE / NE	1.0 UJ	0.232	0.179	0.0263 U	0.752	0.020 U	0.012	0.033	0.077 J	1.0	0.0086 J	0.0068 J	0.034	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	1.0 UJ	0.1 U	0.1 U	0.0263 U	0.163	0.024	0.088	0.019 J	0.17	0.25	0.29 J	0.27	0.47	NA
Fluoranthene	640 / 1,400	640 / 1,400	1.0 UJ	0.391	0.298	0.0263 U	0.324	0.020 U	0.019	0.045	0.099 J	0.48	0.022 U	0.017 J	0.021	NA
Pyrene	480 / 1,050	480 / 1,050	1.0 UJ	0.415	0.304	0.0263 U	0.215	0.020 U	0.019	0.035	0.11 J	0.35	0.015 J	0.017 J	0.016 J	NA
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	1.0 UJ	**0.253**	**0.180**	0.0263 U	0.0427	0.020 U	0.006 J	0.015 J	0.037 J	**0.15**	0.016 J	0.0073 J	0.020 U	NA
Chrysene[l]	0.13 / 0.13	12 / 120	1.0 UJ	**0.269**	**0.199**	0.0263 U	0.0461	0.020 U	0.014	0.022	0.066 J	**0.22**	0.027 J	0.0072 J	0.034	NA
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	1.0 UJ	**0.307**	**0.226**	0.0263 U	0.0243 U	0.020 U	0.006 J	0.018 J	0.042 J	**0.20**	0.017 J	0.010 J	0.020 U	NA
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	1.0 UJ	**0.244**	**0.183**	0.0263 U	0.0243 U	0.020 U	0.0047 J	0.016 J	0.038 J	**0.14**	0.012 J	0.020 U	0.020 U	NA
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	1.0 UJ	**0.305**	**0.230**	0.0263 U	0.0243 U	0.020 U	0.0048 J	0.012 J	0.036 J	**0.16**	0.012 J	0.0066 J	0.020 U	NA
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	1.0 UJ	**0.244**	**0.177**	0.0263 U	0.0243 U	0.020 U	0.0055 UJ	0.012 J	0.034 J	**0.13**	0.0064 J	0.0065 J	0.020 UJ	NA
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	1.0 UJ	0.2 U	0.2 U	0.0526 U	0.0485 U	0.020 U	0.0096 U	0.0023 J	0.0062 J	0.032	0.020 U	0.020 U	0.020 UJ	NA
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	1.0 UJ	0.274	0.203	0.0263 U	0.0243 U	0.020 U	0.0047 UJ	0.013 J	0.043 J	0.13	0.010 J	0.0056 J	0.020 U	NA
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	5.0 UJ	0.5 U	0.5 UJ	0.263 U	0.243 U	2.0 U	0.48 UJ	0.96 UJ	1.1 U	1.1 U	0.97 UJ	1.0 U	1.0 UJ	NA
TTEC[l]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals																
Heterotrophic Plate Count (CFU/mL)			280,000	43,000	97,000	3,600	745	11	1,800	70,000 J	430	91,000	150	6,100	3,650	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			17,000	20 U	20 U	34.0	4.00	15,000	20 U	1,700 J	17,000	19,200	1,000 J	2,000	11,500 J	NA
Nitrate + Nitrite as N (mg/L)			0.03	1.79	1.92	0.00500 U	1.32	0.2 U	0.05 J	0.2 U	0.07	0.16	0.05	0.06	0.13	NA
Phosphorus, Total (mg/L)			0.01 U	0.136 U	0.125 U	0.0363	0.0582	0.02	0.03	0.06	0.16	0.23	0.05	0.06	0.03	NA
Sulfate as SO4 (mg/L)			12	779 J	773 J	262	694	249	571	496	565	483	518	332	463	NA
Total Organic Carbon (TOC) (mg/L)			13	4.82	4.2	1.90	3.05	3	2.9	3.8	4.4	7.8	5.1	4.9	8.3	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[l] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID: / Date Sampled: / QAQC:	Cleanup Level Through 2007 MTCA Mtd B / Mtd C	Cleanup Level Current (2017) MTCA Mtd B / Mtd C	AV-08 (continued) 9/23/2008	9/22/2009	9/9/2010	9/21/2011	9/20/2012	9/17/2013	9/29/2014	9/14/2015	9/15/2016	9/27/2017	9/13/2018	9/24/2019	9/14/2020
TPH (mg/L)															
Diesel	1.0*	0.5*	**0.94** [g]	**1.1** [g]	**2.6 J** [g]	**1.0** [g]	**1.3** [i]	**1.7** [g]	**2.8** [g]	**3.8** [g]	**5.0** [g]	**3.1 J** [g]	**3.5** [g]	**5.7** [g]	**6.0** [g]
Oil [§]	1.0*	0.5*	0.53 U	0.53 U	0.50 UJ	0.56 U	0.52 U	0.41 J	**1.1** [h]	**1.4** [h]	**1.3** [h]	**1.2** [h]	**1.2** [h]	**1.1** [h]	**2.3 J**
PAHs (ug/L)															
Naphthalene	320 / 700	160 / 350	11	1.3	26	0.14 J	0.041 J	0.46 J	0.15	0.23	1.4 J	1.7 J	0.91	4.3	1.2
2-Methylnaphthalene	32 / 70	32 / 70	0.11	0.014	0.41	0.056 J	0.13 J	0.038 J	0.17 J	0.090 J	1.3	0.077 J	0.043	0.041 J	0.073 J
Acenaphthylene	NE / NE	NE / NE	0.14	0.08	0.36	0.018 U	0.0073 U	0.036 J	0.080	0.12	0.13	0.12 J	0.077	0.13	0.37
Acenaphthene	960 / 2,100	960 / 2,100	1.8	0.23	4.3	0.0044	0.0048 J	0.018 UJ	0.047	0.55	0.76 J	1.5 J	0.51	11	30
Dibenzofuran	64 / 140	16 / 35	0.043	0.057	3.7	0.041	0.0065 J	0.018 UJ	0.031	0.56	0.67	1.9 J	0.72	7.9	10
Fluorene	640 / 1,400	640 / 1,400	0.030	0.068	24 U	0.028 U	0.027 J	0.083 J	0.31 J	0.096 J	0.1	0.10 J	0.081	0.75	5.3
Phenanthrene	480 / 1,050	NE / NE	0.020 U	0.0034 U	0.036 U	0.016 U	0.0033 U	0.0035 U	0.017 U	0.016 J	0.018 U	10 U	0.017	0.069	0.057 J
Anthracene	4,800 / 10,500	4,800 / 10,500	0.34	0.14	0.36	0.28	0.37	0.39	0.77	0.96	1.7	1.5 J	1.3	1.7	1.8
Fluoranthene	640 / 1,400	640 / 1,400	0.023	0.0022 J	0.014 J	0.0073	0.0051 J	0.0080 J	0.017 U	0.0034 U	0.029	6.0 U	0.013	0.0093	0.014
Pyrene	480 / 1,050	480 / 1,050	0.023	0.0053	0.020	0.013	0.014	0.015	0.019	0.011	0.020 J	0.023 J	0.016	0.015	0.028
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.0077 J	0.0034 U	0.0036 U	0.0065	0.0051	0.0035 UJ [p]	0.0034 U	0.0040 U	0.035	6.0 U	0.0034 U	0.0033 U	0.0079
Chrysene[1]	0.13 / 0.13	12 / 120	0.0065 J	0.00094 J	0.064	0.0056	0.0056	0.034 J [p]	0.045	0.035	0.018 U	10 U	0.036	0.033	0.026
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.012 J	0.0034 U	0.012	0.011	0.0057	0.0058	0.014	0.0034 U	0.018 U	6.0 U	0.0051	0.0033 U	0.0034 U
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.020 U	0.0034 U	0.0029 J	0.0036	0.0017 J	0.0016 J	0.0020 J	0.0034 U	0.018 U	6.0 U	0.0034 U	0.0033 U	0.0034 U
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.0095 J	0.0034 U	0.0071	0.0067	0.0043	0.0016 J	0.0039	0.0034 U	0.018 U	6.0 U	0.0034 U	0.0033 U	0.0034 U
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.0090 J	0.0034 U	0.0071	0.0057	0.0034	0.0015 J	0.0040	0.0034 U	0.018 U	6.0 U	0.0034 U	0.0033 U	0.0034 U
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.020 UJ	0.0034 U	0.0016 J	0.0020 J	0.0011 J	0.0035 U	0.0034 U	0.0034 U	0.018 U	6.0 U	0.0034 U	0.0033 U	0.0034 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0077 J	0.0034 U	0.0061	0.0072	0.0038	0.0014 J	0.0038 J+	0.0034 U	0.018 U	6.0 U	0.0034 U	0.0033 U	0.00083 J
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	1.0 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.22 J	0.37 J	0.25 U	0.17 J	0.25 U	0.25 U	0.25 U
TTEC[1]	NE / NE	0.012 / 0.12	0.012	0.00001	0.010	0.0096	0.0061	0.0028	0.0064	0.00035	0.0035	NA	0.00087	0.00033	0.00105
Conventionals															
Heterotrophic Plate Count (CFU/mL)			330 J	550 J	22.0 J	34.0	605	15,000	2.00	42.5	0.50 U	1.50	8.50	6.50	6.50
Hydrocarbon Degrading Bacteria (MPN/100 mL)			5,810 J	≥ 8,000,000 J	2,000 J	800	900 UJ	3,400	39,500	900 U	1,000	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.19	0.090	0.092	0.057	0.130	0.182	0.050 UJ	0.050 U	0.021 J	0.080	0.028 J	0.050 U	0.050 U
Phosphorus, Total (mg/L)			0.07	0.058	0.137	0.072	0.176	0.141	0.228	0.182	0.145	0.217	0.281	0.327	0.42
Sulfate as SO4 (mg/L)			462	347	359	201	288	279	239	212	183	178	170	123	99.5
Total Organic Carbon (TOC) (mg/L)			7.4	8.56	14.8	8.07	8.82	9.8	13.0	15.8	19.2	20.1	20.9	32.3	35.5

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007 MTCA	Cleanup Level Current (2017) MTCA	AV-09																	
Date Sampled:			5/3/2002	9/11/2002	3/6/2003	9/12/2003	3/10/2004	9/10/2004	3/15/2005	9/21/2005	3/22/2006	9/27/2006	3/8/2007	6/8/2007	9/19/2007	12/19/2007	3/25/2008	9/23/2008	3/18/2009	9/23/2009	9/23/2009
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																		Field Filtered
TPH (mg/L)																				
Diesel	1.0*	0.5*	0.250 U	0.250 U	0.25 U	0.053 J	0.150 J	0.051 J	0.21 J	0.25 U	0.16 J	0.093 J	0.26 U	0.25 U	0.27 U	0.27 U	0.035 J	0.032 J	0.27 U	0.28 U	NA
Oil [§]	1.0*	0.5*	0.500 U	0.500 U	0.5 U	0.53 U	0.210 J	0.52 U	0.50 U	0.50 U	0.16 J	0.50 U	0.52 U	0.50 U	0.53 U	0.53 U	0.50 UJ	0.52 U	0.53 U	0.56 U	NA
PAHs (ug/L)																				
Naphthalene	320 / 700	160 / 350	147	0.743	0.19	0.064 U	0.96 U	0.015 U	0.061 J	0.1 U	0.022 U	0.059	0.026 J	0.011 J	0.0054 U	0.023 U	0.020 U	0.011 J	0.016 U	0.0077	0.014
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	0.020 U	0.015 U	NA	0.0094 J	0.0074 J	0.1 U	0.010 J	0.57	0.010 J	0.0026 J	0.0023 J	0.0059 J	0.020 U	0.020 U	0.0037 U	0.0034 U	0.0034 U
Acenaphthylene	NE / NE	NE / NE	0.244 U	0.0305	0.020 U	0.0033 J	NA	0.0054 J	0.0037 J	0.0023 J	0.0053 J	0.040	0.020 U	0.020 U	0.02 U	0.020 U	0.020 U	0.020 U	0.0011 J	0.00078 J	0.0096
Acenaphthene	960 / 2,100	960 / 2,100	3.99	0.627	0.16	0.018 U	NA	0.0085 J	0.021 J	0.10 U	0.010 J	1.7	0.055 J	0.020 U	0.0052 J	0.051	0.0052 J	0.020 U	0.0023 J	0.0082	0.0054 U
Dibenzofuran	64 / 140	16 / 35	NA	NA	0.020 U	0.0074 J	NA	0.02 U	0.0097 J	0.1 U	0.0075 J	1.1	0.015 J	0.020 U	0.020 U	0.012 J	0.020 U	0.020 U	0.0017 J	0.0032 J	0.0034 U
Fluorene	640 / 1,400	640 / 1,400	0.689	0.271	0.042	0.01	NA	0.008 J	0.014 J	0.10 U	0.015 J	1.7	0.037 J	0.020 U	0.0049 J	0.024	0.020 U	0.020 U	0.0018 J	0.0044	0.0013 J
Phenanthrene	480 / 1,050	NE / NE	0.936	0.538	0.24	0.099	NA	0.031	0.17	0.10 U	0.071	3.2	0.45 J	0.0085 J	0.042	0.32	0.039 U	0.011 J	0.012	0.039	0.0048 U
Anthracene	4,800 / 10,500	4,800 / 10,500	0.0953	0.0961	0.037	0.028	NA	0.044	0.068 J	0.024 J	0.048	0.42	0.13 J	0.020 J	0.023	0.10	0.035	0.0075 J	0.0072	0.012	0.0058
Fluoranthene	640 / 1,400	640 / 1,400	0.0608	0.204	0.14	0.21	NA	0.052	0.50	0.042 J	0.13	1.9	1.6 J	0.021	0.12	0.80	0.092	0.025	0.021	0.11	0.0022 J
Pyrene	480 / 1,050	480 / 1,050	0.0477	0.123	0.12	0.18	NA	0.048	0.43	0.046 J	0.11	0.96	1.3 J	0.017 J	0.10	0.64	0.094	0.023	0.019	0.085 J	0.0011 J
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.0244 U	0.0244 U	0.064	0.12	0.036 J	0.027	**0.22**	0.022 J	0.066	**0.33**	**0.96 J**	0.014 J	0.080	**0.61**	0.089	0.020	0.017	0.076	0.0034 U
Chrysene[1]	0.13 / 0.13	12 / 120	0.0244 U	0.0244 U	0.082	**0.17**	0.039 J	0.037	**0.29**	0.031 J	0.085	**0.43**	**1.3 J**	0.016 J	0.085	**0.61**	0.090	0.022	0.018 J	0.086	0.0034 U
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.0244 U	0.0244 U	0.081	0.12	NA	0.041	**0.33**	0.037 J	0.096	**0.38**	**1.7 J**	0.023	**0.16**	**1.2**	**0.15**	0.032	0.032	**0.17**	0.0034 U
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.0244 U	0.0244 U	0.069	**0.23**	NA	0.034	**0.24**	0.018 J	0.058	**0.25**	**0.70 J**	0.0071 J	0.043	**0.38**	0.045	0.010 J	0.010 J	0.053	0.0034 U
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.0244 U	0.0244 U	0.070	**0.16**	NA	0.033	**0.28**	0.025 J	0.080	**0.25**	**1.2 J**	0.013 J	0.076	**0.68 J**	**0.12**	**0.025**	**0.023**	**0.12**	0.0034 U
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.0244 U	0.0244 U	0.051	0.10	NA	0.029	**0.25 J**	0.019 J	0.062	**0.18**	**0.99 J**	0.011 J	0.086	**0.76**	0.097	0.024 J	0.021	**0.13**	0.0034 U
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.0488 U	0.0488 U	0.020 U	0.032	NA	0.0063 J	0.049 J	0.0038 J	0.0097 J	0.048	**0.23 J**	0.0026 J	0.018 J	**0.14**	**0.019 J**	0.0052 J	0.0037 J	**0.028**	0.0034 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0244 U	0.0244 U	0.054	0.088	NA	0.032	0.26	0.025 J	0.064	0.21	0.91 J	0.012 J	0.082	0.75	0.086	0.023	0.020	0.12	0.0034 U
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.244 U	0.244 U	2.0 U	0.5 UJ	0.96 U	1.0 UJ	0.95 U	1.0 U	0.095 U	1.0 U	0.96 UJ	0.96 U	1.0 UJ	0.98 UJ	0.96 UJ	0.98 UJ	0.5 U	0.50 U	NA
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.161**	**0.034**	**0.032**	**0.167**	NA
Conventionals																					
Heterotrophic Plate Count (CFU/mL)			1,080	15,600 J	10	875	245 J	190	183 J	58	99	530	171	3,950	65	130	23.0 J	9.5 J	255	1,340 J	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	500	110,000	270	8,000 J	11,000	≥ 160,000	11,000	########	17,000	15,000	1,000	7,000 J	110,000	85,000 J	800,000 J	5,500	40,000 J	NA
Nitrate + Nitrite as N (mg/L)			NA	0.0220	7.4	21 J	2.3	1.2	0.5	0.57	2.08	0.64	1.49	0.37	0.26	0.77	1.57	0.24	0.050 U	0.050 U	NA
Phosphorus, Total (mg/L)			NA	0.190	0.03	0.69	0.40	0.19	1.65	0.09	0.22	0.06	0.02	0.07	0.03	0.05 J	0.07	0.01	0.03 J+	0.063	NA
Sulfate as SO4 (mg/L)			NA	35.0	32	262	217	173	209 J	201	372	220	302	245	221	228	199	235	222	141	NA
Total Organic Carbon (TOC) (mg/L)			NA	2.68	1.6	3.5	6.5	1.2	4.0	1.7	1.7	1.3	1.1	1.0	1.3	1.0	1.3	1.8	1.5	2.75	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID: / Date Sampled: / QAQC:	Cleanup Level Through 2007 MTCA Mtd B / Mtd C	Cleanup Level Current (2017) MTCA Mtd B / Mtd C	AV-09 (continued) 3/17/2010	9/8/2010	3/9/2011	9/21/2011	3/14/2012	9/20/2012	3/13/2013	9/17/2013	3/6/2014	9/29/2014	3/3/2015	9/15/2015	3/24/2016	9/15/2016	3/22/2017	9/27/2017	3/21/2018	9/12/2018	3/20/2019	9/25/2019	4/1/2020	9/14/2020
TPH (ug/L)																								
Diesel	1.0*	0.5*	0.27 U	0.28 U	0.28 U	0.30 U	0.30 U	0.26 [g]	0.30 [g]	0.36 [g]	0.45 [g]	0.29 J	0.32 [g]	0.27 [l]	**0.61** [g]	0.32 [g]	0.28 J	0.27 UJ	**0.51 J** [g]	0.16 J	**0.52 J** [g]	0.27 U	0.27 U	0.25 U
Oil [§]	1.0*	0.5*	0.53 U	0.55 U	0.56 U	0.59 U	0.59 U	0.50 U	0.52 U	0.40 J	0.38 J	**0.54** [h]	**0.60** [k]	**0.87** [k]	**0.64** [h]	0.53 U	0.53 U	0.53 U	**0.54 J** [h]	0.56 U	**0.66** [h]	0.53 U	0.53 U	0.50 U
PAHs (ug/L)																								
Naphthalene	320 / 700	160 / 350	0.14	0.063	0.044	0.0076	0.038	0.014	0.017	0.011	0.056	0.017	0.016	0.0082 J	0.045	0.041 J	0.040	1.0 U	0.062 J	0.0086	0.038 J	0.0080	0.008	0.0067 J
2-Methylnaphthalene	32 / 70	32 / 70	0.018	0.016	0.0037 U	0.0034 U	0.0048	0.0046	0.0073	0.0050 J+	0.011	0.0034 U	0.0034 U	0.0034 UJ	0.011	0.014	0.0087	0.60 U	0.0042 J	0.0027 J	0.0042 J	0.0023 J	0.0023 J	0.0034 U
Acenaphthylene	NE / NE	NE / NE	0.0035 U	0.0036 U	0.0030 J	0.0020 J	0.0021 J	0.0024 J	0.0068	0.0039	0.0047 J+	0.0034 U	0.0065	0.0034 UJ	0.0073	0.0033 U	0.0031 J	0.60 U	0.0034 U	0.0034 U	0.010	0.0013 J	0.0013 J	0.0034 U
Acenaphthene	960 / 2,100	960 / 2,100	0.012	0.0063	0.017	0.0048	0.012	0.013	0.027	0.012	0.010	0.0032 J	0.0064 J	0.0088 J	0.0058	0.0056 J	0.0097	0.0036 J	0.0050	0.0066	0.0032 UJ	0.014	0.014	0.022
Dibenzofuran	64 / 140	16 / 35	0.0048	0.0066	0.0081	0.0041	0.0094	0.0085	0.022	0.0057 J+	0.012	0.0043	0.0073	0.0042 J	0.010	0.0044 J	0.0092	0.0026 J	0.013	0.0019 J	0.012	0.0032	0.0032	0.0034 U
Fluorene	640 / 1,400	640 / 1,400	0.0052	0.0043	0.0098	0.0033 J	0.010	0.010	0.027	0.0073	0.013	0.0026 J	0.0063 J	0.0077 J	0.017	0.0040 J	0.012	0.0063 J	0.020	0.0034 U	0.035 J	0.0068	0.0068	0.0062
Phenanthrene	480 / 1,050	NE / NE	0.042	0.0089	0.10	0.02	0.052	0.074	0.10	0.038	0.021	0.012	0.016	0.024 J	0.012	0.0066 J	0.016	1.0 U	0.012	0.0046 J	0.013	0.012	0.012	0.0092
Anthracene	4,800 / 10,500	4,800 / 10,500	0.013	0.0064	0.040	0.026	0.054	0.099	0.23	0.19	0.20	0.078	0.21	0.037 J	0.28	0.079	0.11	0.10 J	0.40	0.018	0.36	0.039	0.039	0.027
Fluoranthene	640 / 1,400	640 / 1,400	0.12	0.016	0.29	0.051	0.13	0.21	0.15	0.092	0.022	0.016	0.019	0.048 J	0.015	0.0046	0.022	0.021 J	0.015 J	0.0036 J	0.016	0.012	0.012	0.013
Pyrene	480 / 1,050	480 / 1,050	0.11	0.015	0.25	0.048	0.12	0.21	0.14	0.091	0.023	0.020	0.023	0.041 J	0.011	0.0038 J	0.020	1.0 U	0.016	0.0044 J	0.015	0.011	0.011	0.013
Benzo[a]anthracene [1]	0.13 / 0.13	0.12 / 1.2	0.09	0.013	**0.20**	0.038	0.11	**0.17**	0.11	0.071	0.019	0.015	0.020	0.033 J	0.0088	0.0033 U	0.015	0.60 U	0.013	0.0026 J	0.013	0.0078	0.0078	0.010
Chrysene [1]	0.13 / 0.13	12 / 120	0.11	0.015	0.24	0.048	0.11	0.21	0.12	0.081	0.020	0.017	0.016	0.036 J	0.0090	0.0033 U	0.018	1.0 U	0.013	0.0022 J	0.013	0.0078	0.0078	0.0096
Benzo[b]fluoranthene [1]	0.13 / 0.13	0.12 / 1.2	**0.19**	0.027	**0.46**	0.080	**0.22**	**0.33**	**0.22**	**0.14**	0.036	0.028	0.035	0.063 J	0.017	0.0033 U	0.027	0.029 J	0.020	0.0044	0.024	0.014	0.014	0.016
Benzo[k]fluoranthene [1]	0.13 / 0.13	1.2 / 12	0.062	0.0079	0.15	0.031	0.064	0.12	0.074	0.048	0.011	0.0091	0.0085	0.021 J	0.0047	0.0033 U	0.0092	0.011 J	0.0071	0.0034 U	0.0093	0.0046	0.0046	0.0058
Benzo[a]pyrene [1]	0.13 / 0.13	0.012 / 0.12	**0.14**	**0.018**	**0.27**	**0.049**	**0.15**	**0.24**	**0.16**	**0.098**	**0.027**	**0.020**	0.025	**0.045 J**	0.0097	0.0033 U	**0.020**	**0.019 J**	**0.016**	0.0029 J	**0.014**	0.0095	0.0095	0.012
Indeno[1,2,3-cd]pyrene [1]	0.13 / 0.13	0.12 / 1.2	**0.13**	0.021	**0.30**	0.057	**0.14**	**0.25**	**0.19**	0.095	0.025	0.020	0.024	0.041 J	0.010	0.0016 J	0.017	0.018 J	0.017	0.0023 J	0.016	0.0091	0.0091	0.010
Dibenzo[a,h]anthracene [1]	0.13 / 0.13	0.012 / 0.12	**0.031**	0.0037	**0.065**	**0.013**	**0.028**	**0.054**	**0.039**	**0.021**	0.0053	0.0036	0.0049	0.010 J	0.0026 J	0.0033 U	0.0034 J	0.0034 J	0.0033 J	0.0034 U	0.0046	0.0022 J	0.0022 J	0.0023 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.16	0.020	0.33	0.056	0.14	0.22	0.17	0.099	0.025	0.021	0.024	0.042 J	0.010	0.0033 U	0.016	0.017 J	0.015	0.0027 J	0.015	0.0091	0.0091	0.0099
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.30 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
TTEC [1]	NE / NE	0.012 / 0.12	**0.191**	**0.0254**	**0.390**	**0.0714**	**0.207**	**0.335**	**0.22**	**0.14**	**0.037**	**0.028**	**0.034**	**0.062**	**0.014**	0.00016	**0.027**	**0.025**	**0.022**	0.0039	**0.021**	**0.013**	**0.013**	**0.017**
Conventionals																								
Heterotrophic Plate Count (CFU/mL)			25.0	16.0 J	52.0	33.5 J	450	25.0	174	45.5	11.0	4.50	17.0 J	4.50	13.0	0.50 U	242	15.5	5.50	6.00	10.5	31.5	31.5	11.5
Hydrocarbon Degrading Bacteria (MPN/100 mL)			16,000 J	2.0 UJ	2,000	200 U	400	900 UJ	1,000 J	1,000	11,500 J	900 U	900 U	900 U	900 U	900 U	1,000	900 U	900 U	900 U	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.108	0.050 U	0.05 U	0.050 U	0.072	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.022 J	0.050 U	0.021 J	0.075	0.084	0.050 U	0.033 J	0.050 U	0.021 J	0.021 J	0.050 UJ
Phosphorus, Total (mg/L)			0.057	0.068	0.031	0.034	0.119	0.133	0.129	0.238	0.082	0.232	0.332	1.55	0.540	1.13	0.994	1.30	0.524	5.92	0.569	1.75	1.75	2.01
Sulfate as SO4 (mg/L)			79	43.9	123	45.7	65.5	55.4	48.1	27.9	22.2	4.71	10.7	1.72	3.82	1.47	0.39 J	0.36 J	0.59	0.20 U	0.77	0.54	0.54	1.53
Total Organic Carbon (TOC) (mg/L)			3.53	4.37	2.62	3.59	4.13	11.7	7.7	17.8	16.7	37.7	15.7	55.6	21.8	53	43.0	32.5	29.7	22	36	33.0	33.0	33.0

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-10																
Date Sampled:	MTCA	MTCA	5/3/2002	9/11/2002	9/11/2002	3/6/2003	3/6/2003	9/12/2003	9/12/2003	3/10/2004	3/10/2004	9/10/2004	3/15/2005	3/15/2005	9/21/2005	3/22/2006	9/27/2006	3/8/2007	9/19/2007	12/19/2007
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C			Field Dup		Field Dup		Field Dup		Field Dup			Field Dup						
TPH (mg/L)																				
Diesel	1.0*	0.5*	**11.8**[d]	**7.45**[e]	**8.17**[e]	**11**[g]	**14**[g]	**1,200**[g] **J**	**660**[g] **J**	**870**[j] **J**	**950**[j] **J**	**31**[i]	**34**[i]	**38**[i]	**28**[i]	**31**[i]	**16**[g]	**1.5**[k]	**2.9**[g]	**6.1**[g]
Oil[§]	1.0*	0.5*	0.500 U	0.500 U	0.5 U	0.92[h]	**1.4**[h]	**150**[h] **J**	**81**[h] **J**	**110**[j] **J**	**120**[j] **J**	**3.2**[h]	**4.8**[i]	**5.1**[i]	**4.6**[i]	**7.3**[i]	**2.0**[i]	0.52 U	0.84[h]	0.97[h]
PAHs (ug/L)																				
Naphthalene	320 / 700	160 / 350	**1,150**	**867**	**800**	**1,500**	**1,400**	**26,000 J**	**17,000 J**	**480,000 J**	**93,000 J**	**2,400**	**1,500**	**1,500**	**1,300**	51	200	0.069 J	0.15	6.2
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	**830**	**820**	**42,000 J**	**25,000 J**	NA	NA	0.095 UJ	**2,400**	**2,100**	**5,200**	**850**	**980**	0.057 J	0.24	2.5
Acenaphthylene	NE / NE	NE / NE	2.44 U	5.90 U	3.4	5.8	5.6	230 J	150 J	NA		18	22	18	61	26	17	0.20 J	2.3	6.4
Acenaphthene	960 / 2,100	960 / 2,100	114	68.3	54	300	300	**16,000 J**	**9,100 J**	NA	NA	**1,400**	**1,000**	920	**2,700**	**1,200**	870	1.7 J	17	65
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	**160**	**170**	**11,000 J**	**6,500 J**	NA	NA	**930**	**640**	**550**	**1,900**	**700**	**450**	0.020 U	0.42	18
Fluorene	640 / 1,400	640 / 1,400	38.4	27.4	22.4	140	150	**9,300 J**	**5,600 J**	NA	NA	**790**	500	410	**1,700**	**640**	480	0.020 U	0.72	15
Phenanthrene	480 / 1,050	NE / NE	17.1	8.05	7.98	190	200	**17,000 J**	**9,800 J**	NA	NA	**1,400**	**920**	**700**	**3,000**	**1,200**	**800**	0.020 U	1.8	1.2
Anthracene	4,800 / 10,500	4,800 / 10,500	1.31	1.30	1.19	28	30	2,800 J	1,600 J	NA	NA	200	130	97	560	180	110	0.75 J	1.6	2.8
Fluoranthene	640 / 1,400	640 / 1,400	1.15	1.25	1.07	72	77	**7,200 J**	**4,300 J**	NA	NA	460	330	250	**1,000**	500	340	0.14 J	9.1	7.5
Pyrene	480 / 1,050	480 / 1,050	0.797	0.717	0.725	44	53	**3,700 J**	**2,200 J**	NA	NA	330	220	170	**810**	330	210	0.054 J	2.2	3.3
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	0.0987	0.236 U	0.59 U	**11**	**12**	**1,100 J**	**590 J**	**20,000 J**	**4,200 J**	**80**	**41**	**32**	**210**	**78**	**47**	0.042 J	**1.6**	**0.82**
Chrysene[l]	0.13 / 0.13	12 / 120	0.0999	0.236 U	0.59 U	**9.8**	**11**	**1,000 J**	**550 J**	**16,000 J**	**3,400 J**	**77**	**39**	**30**	**210**	**77**	**47**	**0.15 J**	**1.3**	**1.1**
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	0.0812	0.236 U	0.59 U	**4.3**	**4.9**	**400 J**	**230 J**	NA	NA	**39**	**19**	**15**	**99**	**36**	**20**	0.091 J	**1.2**	**0.96**
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	0.0718	0.236 U	0.59 U	**3.4**	**3.7**	**370 J**	**210 J**	NA	NA	**24**	**14**	**11**	**68**	**26**	**15**	0.040 J	**0.33**	**0.29**
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	0.0668	0.236 U	0.59 U	**3.7**	**4.1**	**350 J**	**200 J**	NA	NA	**28**	**14**	**11**	**73**	**29**	**14**	0.050 J	**0.51**	**0.52 J**
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	0.0244 U	0.236 U	0.59 U	**1.5**	**1.8**	**150 J**	**90 J**	NA	NA	**12**	**6.3 J**	**4.9 J**	**29**	**13**	**6.6**	0.033 J	**0.31 J**	**0.34**
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	0.0488 U	0.472 U	1.18 U	**0.33**	**0.41**	**34 J**	**20 J**	NA	NA	**2.6**	**1.5 J**	**1.3 J**	**8.0 J**	**3.3**	**1.6**	0.0065 J	0.070 J	0.078 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0244 U	0.236 U	0.59 U	1.2	1.4	120 J	69 J	NA	NA	10	5.5	4.4	28	12	5.9	0.033 J	0.26	0.30
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	1.22 U	2.36 U	5.9 U	20 U	20 U	**13 J**	**9.5 J**	**1,700 J**	**330 J**	**3.0 J**	19 U	**2.4 J**	96 U	**13 J**	**1.5 J**	0.10 J	0.32 J	**0.81 J**
TTEC[l]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals																				
Heterotrophic Plate Count (CFU/mL)			110	328,000 J	332,000	19,000	10,600	1,700,000	1,310,000	330,000 J	220,000 J	192	700 J	1,000 J	9,000	74,000	24,400 J	8,400	59,500	73,500
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	300	3,000	250,000	650,000	5,000 J	2,800 J	1,600,000	1,600,000 J	26,000	160,000	160,000	≥ 1,600,000	≥ 16,000,000	≥ 1,600,000	1,100,000 J	≥ 8,000,000	800,000
Nitrate + Nitrite as N (mg/L)			NA	0.00500 U	0.005 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.4	0.4	0.2 U	0.2 U	0.2 U	3.15	3.29	0.16	30.3	14.3	7.21
Phosphorus, Total (mg/L)			NA	0.0692	0.0559	0.50	0.36	8.25 J	1.12 J	0.40	0.44	0.43	0.63	0.43	0.28	0.62	0.57	0.06	0.09	0.33 J
Sulfate as SO4 (mg/L)			NA	10.6	11.4	73	72	49	47	77	80.8	14.5	108 J	111 J	121	172	126	182	196	183
Total Organic Carbon (TOC) (mg/L)			NA	20.0	20.2	23.9	23.3	95	97	110 J	60 J	28.2	26.8	29.8	22	25.3	30	13.2	21.8	40.7

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[l] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID: / Date Sampled: / QAQC:	Cleanup Level Through 2007 MTCA Mtd B / Mtd C	Cleanup Level Current (2017) MTCA Mtd B / Mtd C	AV-10 (continued) 3/25/2008	9/25/2008	3/19/2009	9/23/2009	3/17/2010	9/9/2010	3/8/2011	9/20/2011	3/14/2012	9/20/2012	3/14/2013	9/17/2013	3/7/2014	9/30/2014	3/4/2015	9/15/2015	3/23/2016	9/15/2016	3/22/2017	9/28/2017	3/22/2018	9/13/2018	3/20/2019	9/24/2019	4/1/2020	9/14/2020
TPH (mg/L)																												
Diesel	1.0*	0.5*	**3.6 J**[g]	**5.0**[g]	**4.1**[g]	**4.3**[g]	**4.6**	**6.8**[g]	**6.2**[g]	**6.7**[g]	**7.5**[g]	**9.3**[g]	**7.5**[g]	**9.8**[g]	**6.6**[g]	**11**[g]	**6.5**[g]	**9.5**[g]	**12**[g]	**12**[g]	**7.5**[g]	**9.3**[g]	**9.4**[g]	**6.3**[g]	**11 J**[g]	**7.5**[g]	**6.4**[g]	**4.1**[g] **J**
Oil [§]	1.0*	0.5*	**0.65 J**[h]	**1.1**[h]	**1.3**[i]	**0.86**	**0.96**	**2.6**[h]	**1.6**[h]	2.4 U	**3.4**[h]	**2.9**[h]	**2.9**[h]	**4.9**[h]	**2.3**[h]	**9.3**[h]	**3.2**[h]	**8.2**[h]	**7.7**[k]	**7.9**[h]	**3.9**[h]	**4.9**[h]	**7.0**[h]	**4.3**[h]	**7.6**[h]	**4.2**[h]	**3.9**[h]	**3.2 J**
PAHs (ug/L)																												
Naphthalene	320 / 700	160 / 350	4.9	5.7	1.8	1.5	4.9	8.9	11	14	8.5	12	6.2	7.2	8.8	4.0	4.7	4.8	4.9	5.8 J	6.2	5.7 J	41	54	26	3.4	48	4.3
2-Methylnaphthalene	32 / 70	32 / 70	2.1	0.35	0.034 U	0.16	1.1	1.3	5.1	7.3	1.8	1.6	0.55	1.2	4.0	0.86	0.57	2.3	0.41	1.9	0.47	2.1 J	0.36	4.2	1.3	2.7	4.6 J	4.3
Acenaphthylene	NE / NE	NE / NE	1.7	4.8	1.3	4.1	5.0	4.2	2.2	2.3	2.3	2.8	2.4	3.2	2.3	2.4	2.3	2.3	1.4	2.6	1.8	2.4 J	1.3	1.7	1.4	1.6	1.7	1.9
Acenaphthene	960 / 2,100	960 / 2,100	42	140	46	160	240	210	97	100	100	130	92	100	140	91	76	83	69	110 J	95	110	62	67	59	63	70	72
Dibenzofuran	64 / 140	16 / 35	**16**	**51**	11	**28**	**43**	**100**	**31**	**20**	**52**	**36**	**34**	**44**	**100**	**41**	**36**	**41**	**37**	**53**	**39**	**65**	**27**	**33**	**31**	**29**	**34**	**29**
Fluorene	640 / 1,400	640 / 1,400	14	41	9.7	29	55	70	31	25	37	37	33	40	59	37	31	31	27	38	31	36	21	28	24	24	30	24
Phenanthrene	480 / 1,050	NE / NE	4.5	18	0.56	8.0	19	40	15	9.9	25	16	13	20	44	21	30	27	28	35	30	30	17	19	22	17	21	15
Anthracene	4,800 / 10,500	4,800 / 10,500	2.5	3.5	1.5	3.0	4.8	8.3	6.6	7.6	8.1	11	10	11	7.4	15	12	9.8	8.2	14	9.3	13	10	9.2	9.4	8.5	8.7	8.3
Fluoranthene	640 / 1,400	640 / 1,400	1.6	5.6	1.7	1.4	3.5	9.1	2.6	1.6	3.2	3.0	3.0	3.9	4.6	3.4	3.8	4.9	3.9	6.4	5.6	7.0 J	3.9 J	4.9	4.6	3.4	4.5	3.5
Pyrene	480 / 1,050	480 / 1,050	0.99	4.0	1.0	0.71 J	2.4	5.8	1.6	0.93	1.9	1.6	1.7	2.2	2.5	2.4	2.2	2.5	1.8	2.9 J	2.4	3.6 J	2.3	3.1	2.1	1.9	2.4	2.0
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	**0.16**	**0.39**	0.11	0.11	**0.35**	**0.68**	**0.14**	**0.13**	**0.20**	**0.16**	**0.18**	**0.17**	**0.14**	**0.19**	**0.17**	**0.23**	**0.21**	**0.18**	**0.24**	**0.21 J**	**0.14**	**0.36**	**0.15**	**0.13**	**0.24**	**0.18**
Chrysene[1]	0.13 / 0.13	12 / 120	0.30	0.47	0.074 J	0.14	0.38	0.69	0.094	0.079	0.095	0.100	0.16	0.15 J	0.16	0.13	0.13	0.16	0.25	0.13	0.23	0.18 J	0.14	0.38	0.12	0.11	0.27	0.17
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	**0.32**[m]	**0.19**	0.077	0.077	**0.20**	**0.24**	0.098	0.064 J	**0.14**	0.058	0.076	0.060	0.047	0.098	0.11 J	0.11	**0.13**	0.067 U	0.10	12 U	0.10 J	**0.17**	0.043	0.041	0.11	0.046
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.020 U[m]	0.065	0.035 J	0.038	0.07	0.084	0.045	0.050 J	0.052	0.040	0.024 J	0.044	0.030 J	0.036	0.017 UJ	0.040 J	0.046	0.067 U	0.04 J	12 U	0.017 UJ	0.087	0.024 J	0.016	0.029	0.014 J
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	**0.16**	**0.12**	**0.06**	**0.047**	**0.14**	**0.16**	**0.068**	**0.049 J**	**0.11**	**0.054**	**0.057**	**0.048**	**0.031**	**0.034**	**0.030**	**0.066** J	**0.098**	0.067 U	**0.079**	**0.052 J**	**0.032**	**0.11**	**0.032 J**	**0.030**	**0.073**	**0.046**
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	**0.14**	0.087	0.033 J	0.028	0.086	0.061	0.038	0.029 J	0.077	0.033 J	0.035 J	0.027 J	0.018	0.027	0.014 J	0.025 J	0.072	0.067 U	0.056 J	12 U	0.019	0.049	0.016 J	0.030	0.050 J	0.026
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.020 U	**0.020 J**	0.010 J	0.0047	**0.019 J**	**0.012 J**	0.0071 J	**0.022 J**	**0.021 J**	0.0078 J	0.0066 J	0.0081 J	0.0030 J	0.017 U	0.017 U	0.068 U	**0.030**	0.067 U	0.067 U	12 U	0.017 U	0.033 U	0.032 U	0.016 U	0.017 U	0.017 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.14	0.082	0.034	0.027	0.091	0.049	0.043	0.036 J	0.083	0.032 J	0.034 J	0.025 J	0.020	0.017 J	0.013 J	0.039 J	0.072	0.067 U	0.064 J	0.014 J	0.013 J	0.069	0.018 J	0.013 J	0.039	0.012 J
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.21 J	**0.80 J**	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	**0.15 J**	0.50 U	0.50 U	0.50 U	**0.40 J**	0.25 U	**0.36** J	0.30 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.3 U	0.25 U	0.25 U	0.5 U	0.25 U
TTEC[1]	NE / NE	0.012 / 0.12	**0.225**	**0.200**	**0.087**	**0.074**	**0.216**	**0.275**	**0.102**	**0.0793**	**0.160**	**0.0849**	**0.091**	**0.080**	**0.056**	**0.072**	**0.061**	**0.11**	**0.15**	**0.019**	**0.13**	**0.075**	**0.059**	**0.18**	**0.057**	**0.053**	**0.12**	**0.074**
Conventionals																												
Heterotrophic Plate Count (CFU/mL)			3,300 J	135	230	820 J	830	150	785	180	1,220	52.5	181	81.0	1.00	73.5	0.50 UJ	0.50	92.0	0.50 U	21.0	0.50 U	1.0 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U
Hydrocarbon Degrading Bacteria (MPN/100 mL)			4,500,000	≥ 800,000 J	1,000 J	1,200,000 J	11,300 J	2.0 UJ	NA	200 U	180 U	900 UJ	900 UJ	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			4.30	0.19	0.74	0.119	0.192	0.068	0.090	0.056	0.093	0.106	0.146	0.077	0.151	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.032 J	0.083	0.050 U	0.021 J	0.050 U	0.050 U	0.052	0.050 U
Phosphorus, Total (mg/L)			0.23	0.69	0.26	0.536	0.371	0.572	0.328	0.346	0.610	0.447	0.364	0.386	0.593	0.509	0.518	0.615	0.714	0.708	0.865	0.161	0.614	0.781	0.649	0.619	0.590	0.80
Sulfate as SO4 (mg/L)			173	75	91.1	40.4	21.0	11.5	26.2	11.0	10.0	6.1	9.6	5.09	0.76	3.61	4.9	2.2	5.00	2.30	1.79	2.8	1.46	0.30	1.03	1.31	0.56	0.42
Total Organic Carbon (TOC) (mg/L)			28.2	31.6	13.5	34.4	35	46	54	50	44.2	58.2	56	61.8	42.7	67	76.4	72	77	82	63.8	83	95	78	86	69.7	94	71.4

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-11																
Date Sampled:	MTCA	MTCA	5/3/2002	9/11/2002	3/6/2003	9/12/2003	3/10/2004	9/10/2004	3/15/2005	9/21/2005	3/22/2006	9/27/2006	3/8/2007	9/19/2007	12/19/2007	3/25/2008	9/23/2008	3/19/2009	9/23/2009	9/23/2009
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																		Field Filtered
TPH (mg/L)																				
Diesel	1.0*	0.5*	0.250 U	0.250 U	0.25 U	0.037 J	0.120 J	0.039 J	0.39 [g]	0.26 U	0.25 U	0.25 U	0.26 U	0.15 J	0.27 U	0.028 J	0.012 J	0.27 U	0.26 U	NA
Oil [§]	1.0*	0.5*	0.500 U	0.500 U	0.5 U	0.064 J	0.360 J	0.057 J	0.29 J	0.52 U	0.077 J	0.50 U	0.52 U	**1.0** [k]	0.53 U	0.53 UJ	0.53 U	0.56 UJ	0.52 U	NA
PAHs (ug/L)																				
Naphthalene	320 / 700	160 / 350	0.0242	0.291	0.020 U	0.017 U	0.96 U	4.7	0.046 J	0.15	0.020 U	0.021 U	0.0077 J	0.022 U	NA	0.020 U	0.0033 J	0.18	0.005 U	0.0038 U
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	0.020 U	0.019 U	NA	0.054	0.0031 J	0.047 J	0.0033 J	0.0059 J	0.0045 J	0.0054 J	NA	0.020 U	0.019 U	0.059	0.0034 U	0.0036 U
Acenaphthylene	NE / NE	NE / NE	0.0241 U	0.0236 U	0.020 U	0.0098 U	NA	0.063	0.0031 J	0.004 J	0.0028 J	0.0024 U	0.0043 J	0.022 U	NA	0.020 U	0.019 U	0.0019 J	0.0034 U	0.0093
Acenaphthene	960 / 2,100	960 / 2,100	0.0241 U	0.0778	0.020 U	0.016 U	NA	1.8	0.0034 J	0.087 J	0.0027 J	0.0094 J	0.0036 J	0.025	NA	0.020 U	0.019 U	0.031	0.0019 J	0.0053 U
Dibenzofuran	64 / 140	16 / 35	NA	NA	0.020 U	0.015	NA	0.022	0.11 U	0.064 J	0.0071 U	0.0077 J	0.0064 J	0.017 J	NA	0.020 U	0.019 U	0.031	0.0034 U	0.0036 U
Fluorene	640 / 1,400	640 / 1,400	0.0241 U	0.0630	0.020 U	0.019	NA	0.017 J	0.0070 J	0.089 J	0.0029 J	0.011 J	0.0099 J	0.020 J	NA	0.020 U	0.019 U	0.025	0.00078 J	0.0036 U
Phenanthrene	480 / 1,050	NE / NE	0.0241 U	0.136	0.020 U	0.052	NA	0.016 J	0.019 J	0.20	0.010 J	0.029	0.026 J	0.049	NA	0.020 U	0.019 U	0.045	0.0034 U	0.0036 U
Anthracene	4,800 / 10,500	4,800 / 10,500	0.0241 U	0.0257	0.020 U	0.011	NA	0.21	0.014 J	0.029 J	0.010 J	0.0092 J	0.012 J	0.011 J	NA	0.0045 J	0.019 U	0.0058	0.0052	0.0030 J
Fluoranthene	640 / 1,400	640 / 1,400	0.0241 U	0.0623	0.020 U	0.04	NA	0.028	0.028 J	0.088 J	0.018 J	0.059	0.059 J	0.012 J	NA	0.016 J	0.0050 J	0.0520	0.0054	0.0043
Pyrene	480 / 1,050	480 / 1,050	0.0241 U	0.0439	0.020 U	0.03	NA	0.029	0.024 J	0.069 J	0.013 J	0.043	0.054 J	0.0062 J	NA	0.013 J	0.0057 J	0.041	0.0042 J	0.0032 J
Benzo[a]anthracene [l]	0.13 / 0.13	0.12 / 1.2	0.0241 U	0.0236 U	0.020 U	0.011	0.028 J	0.014 J	0.018 J	0.017 J	0.010 J	0.026	0.022 J	0.0038 J	NA	0.0095 J	0.0061 J	0.023	0.0027 J	0.0036 U
Chrysene [l]	0.13 / 0.13	12 / 120	0.0241 U	0.0236 U	0.020 U	0.015	0.025 J	0.022	0.022 J	0.02 J	0.014 J	0.032	0.030 J	0.022 U	NA	0.0064 J	0.0040 J	0.031 J	0.0027 J	0.0029 J
Benzo[b]fluoranthene [l]	0.13 / 0.13	0.12 / 1.2	0.0241 U	0.0236 U	0.020 U	0.011	NA	0.02	0.020 J	0.012 J	0.012 J	0.032	0.028 J	0.022 U	NA	0.010 J	0.0054 J	0.044	0.0046	0.0038 U
Benzo[k]fluoranthene [l]	0.13 / 0.13	1.2 / 12	0.0241 U	0.0236 U	0.020 U	0.0095 J	NA	0.013 J	0.015 J	0.0075 J	0.011 J	0.020 J	0.015 J	0.022 U	NA	0.0040 J	0.019 U	0.013 J	0.0013 J	0.0013 J
Benzo[a]pyrene [l]	0.13 / 0.13	0.012 / 0.12	0.0241 U	0.0236 U	0.020 U	0.0085 J	NA	0.012 J	0.014 J	0.0079 J	0.0081 J	0.025	0.019 J	0.022 U	NA	0.0076 J	0.0044 J	**0.030**	0.0029 J	0.0024 J
Indeno[1,2,3-cd]pyrene [l]	0.13 / 0.13	0.12 / 1.2	0.0241 U	0.0236 U	0.020 U	0.0073 J	NA	0.016 J	0.013 J	0.0052 J	0.0074 J	0.020 J	0.014 J	0.022 U	NA	0.0066 J	0.0043 J	0.027	0.0030 J	0.0025 J
Dibenzo[a,h]anthracene [l]	0.13 / 0.13	0.012 / 0.12	0.0482 U	0.0472 U	0.020 U	0.0098 U	NA	0.0025 J	0.0029 J	0.10 U	0.0031 J	0.0063 J	0.020 U	0.022 U	NA	0.020 U	0.019 UJ	0.0053	0.00075 J	0.00073 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0241 U	0.0236 U	0.020 U	0.0067 J	NA	0.017 J	0.012 J	0.0061 J	0.0098 J	0.022	0.014 J	0.022 U	NA	0.0083 J	0.0045 J	0.025	0.0034 U	0.0036 U
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.241 U	0.236 U	2.0 U	0.49 UJ	0.96 U	0.95 UJ	1.1 U	1.0 U	0.095 U	1.1 U	0.97 UJ	1.1 U	NA	0.99 UJ	0.95 UJ	0.50 U	0.50 U	NA
TTEC [l]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.011	0.006	**0.042**	0.004	0.003
Conventionals																				
Heterotrophic Plate Count (CFU/mL)			310	6,000	55	2,160	885 J	151	680 J	980	11,500	7,200	99.0	53	NA	480	14.0 J	250	10.0 J	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	240	2,000	9,000	50,000 J	27,000	160,000	17,000	170,000	350,000	4,500	8,500 J	NA	26,300	450,000 J	7,000 J	1,000 UJ	NA
Nitrate + Nitrite as N (mg/L)			NA	0.00500 U	0.2 U	0.8 J	0.2 U	0.2 U	0.2 U	0.07	0.10	0.09	0.04	0.06	NA	0.05 U	0.05 U	0.05 U	0.044 J	NA
Phosphorus, Total (mg/L)			NA	0.175	0.47	0.51	0.39	0.36	0.37	0.35	0.11	2.21	0.34	0.10	NA	0.07	0.10	0.24	0.209	NA
Sulfate as SO4 (mg/L)			NA	83.4	221	363	298	200	200 J	131	92.4	91	58.1	54.0	NA	40.0	42.7	32.6	28.8	NA
Total Organic Carbon (TOC) (mg/L)			NA	5.66	3.2	3.8	1.8	2.0	2.4	3	1.1	4.6	1.5	1.1	NA	1.1	1.5	2.4	2.69	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[l] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID: / Date Sampled: / QAQC:	Cleanup Level Through 2007 MTCA Mtd B / Mtd C	Cleanup Level Current (2017) MTCA Mtd B / Mtd C	AV-11 (continued) 3/17/2010	9/9/2010	3/9/2011	9/20/2011	3/14/2012	9/20/2012	3/14/2013	9/18/2013	3/7/2014	9/30/2014	3/4/2015	9/15/2015	3/24/2016	9/14/2016	3/22/2017	9/28/2017	3/22/2018	9/13/2018	3/20/2019	9/25/2019	4/1/2020	9/14/2020
TPH (mg/L)																								
Diesel	1.0*	0.5*	0.27 U	0.27 U	0.28 U	**0.58** [g]	0.27 U	0.27 U	0.27 U	0.27 U	0.059 J	0.12 J	0.086 J	0.12 J	0.13 J	0.27 U	0.27 U	0.25 U	0.10 J	0.28 U	0.27 UJ	0.25 U	0.29 U	0.25 U
Oil [§]	1.0*	0.5*	0.53 U	0.54 U	0.55 U	**0.74** [k]	0.54 U	0.53 U	0.54 U	0.53 UJ	0.095 J	0.35 [h]	0.15 J	**0.61** [k]	0.54 U	0.54 U	0.54 U	0.50 U	0.52 U	0.55 U	0.53 U	0.50 U	0.57 U	0.50 U
PAHs (ug/L)																								
Naphthalene	320 / 700	160 / 350	0.16	0.054	0.046	0.0041	0.0038 U	0.0034 U	0.0037 U	0.0034 J+	0.0047 J+	0.011	0.0075	0.0035 U	0.059	0.0060 J	0.0045 J	1.0 U	0.0092	0.0098	0.0056 J	0.034	0.0016 J	0.0034 U
2-Methylnaphthalene	32 / 70	32 / 70	0.027	0.020	0.0039 U	0.0036 U	0.0038 U	0.0034 U	0.0037 U	0.0034 U	0.0033 U	0.0034 U	0.0039 J	0.0039	0.016	0.0035 U	0.0037 J	0.60 U	0.0051 J	0.0032 J	0.0033 U	0.0081	0.0020 J	0.0034 U
Acenaphthylene	NE / NE	NE / NE	0.00084 J	0.0036 U	0.0039 U	0.0011 J	0.00079 J	0.0034 U	0.0037 U	0.0034 U	0.0033 U	0.0034 U	0.0012 J	0.0035 U	0.0011 J	0.0035 U	0.0034 U	0.60 U	0.0033 U	0.0015 J	0.0033 U	0.0043	0.0035 U	0.0034 U
Acenaphthene	960 / 2,100	960 / 2,100	0.0068	0.009	0.0036 J	0.0041	0.0038 U	0.0015 J	0.0037 U	0.0034 UJ	0.0033 U	0.0021 J	0.0035 U	0.0089	0.0083	0.0035 U	0.0034 U	0.0063 J	0.0030 J	0.044	0.0033 U	0.0049	0.0015 J	0.0011 J
Dibenzofuran	64 / 140	16 / 35	0.0061	0.0088	0.0023 J	0.0037	0.0038 U	0.0034 U	0.0037 U	0.0034 UJ	0.0033 U	0.0016 J	0.0035 U	0.0071	0.0048	0.0035 U	0.0034 U	0.0057 J	0.0022 J	0.018	0.0033 U	0.0044	0.00088 J	0.0034 U
Fluorene	640 / 1,400	640 / 1,400	0.0039	0.0057	0.0039 U	0.0042	0.0038 U	0.0013 J	0.0037 U	0.0010 J	0.0033 U	0.0012 J	0.0040 J	0.0059 J	0.0052 J	0.0035 U	0.0034 U	0.0088 J	0.0034	0.014	0.0033 U	0.0093	0.0020 J	0.0011 J
Phenanthrene	480 / 1,050	NE / NE	0.0043 U	0.0041	0.0093	0.021	0.0038	0.0053	0.0037 U	0.0034 UJ	0.0059 J+	0.0034 U	0.0063 J	0.0044 J	0.0053 J	0.0036 J	0.0051 J	1.0 U	0.0074	0.010	0.0043 J	0.0048	0.0035 U	0.0034 U
Anthracene	4,800 / 10,500	4,800 / 10,500	0.0038	0.0031 J	0.014	0.015	0.017	0.011	0.0096	0.024	0.015	0.018	0.020	0.0072	0.0064	0.0086	0.011	0.011 J	0.0095	0.0059	0.0063 J	0.076	0.0060	0.0032 J
Fluoranthene	640 / 1,400	640 / 1,400	0.0059	0.0036 J	0.020	0.017	0.0088	0.012	0.0043 J+	0.0018 J	0.0071	0.0034 U	0.0051 J	0.0035 U	0.0044 J	0.0031 J	0.050 J	0.0081 J	0.0063 J	0.0034 U	0.0033 U	0.0032 U	0.0022 J	0.0016 J
Pyrene	480 / 1,050	480 / 1,050	0.0045 U	0.0022 J	0.015	0.011	0.0056	0.011	0.0032 J	0.0021 J	0.0069	0.0023 J	0.0047 J	0.0015 J	0.0031 J	0.0018 J	0.0035 J	1.0 U	0.0045	0.0034 U	0.0025 J	0.055	0.0017 J	0.0018 J
Benzo[a]anthracene [l]	0.13 / 0.13	0.12 / 1.2	0.0025 J	0.00087 J	0.011	0.0024 J	0.0038 U	0.0049	0.0012 J	0.0013 J	0.0014 J	0.0034 U	0.0035 U	0.0041 U	0.0033 U	0.0035 U	0.0034 U	0.60 U	0.0033 U	0.0034 U	0.0033 U	0.0013 J	0.0035 U	0.0034 U
Chrysene [l]	0.13 / 0.13	12 / 120	0.0024 J	0.00087 J	0.010	0.0042	0.0013 J	0.011	0.0037 U	0.0034 U	0.0014 J	0.0034 U	0.0035 U	0.0035 U	0.0014 J	0.0035 U	0.0022 J	1.0 U	0.0033 U	0.0034 U	0.0033 U	0.0025 J	0.0035 U	0.0034 U
Benzo[b]fluoranthene [l]	0.13 / 0.13	0.12 / 1.2	0.0047	0.00097 J	0.021	0.0032 J	0.0038 U	0.0093	0.0037 U	0.00054 J	0.0019 J	0.0034 U	0.0035 U	0.0035 U	0.0015 J	0.0035 U	0.0023 J	0.60 U	0.0033 U	0.0034 U	0.0033 U	0.0032 U	0.0035 U	0.0034 U
Benzo[k]fluoranthene [l]	0.13 / 0.13	1.2 / 12	0.0012 J	0.0036 U	0.0069	0.00078 J	0.0038 U	0.0031 J	0.0037 U	0.0034 U	0.00058 J	0.0034 U	0.0035 U	0.0035 U	0.0033 U	0.0035 U	0.00070 J	0.60 U	0.0033 U	0.0034 U	0.0033 U	0.0032 U	0.0035 U	0.0034 U
Benzo[a]pyrene [l]	0.13 / 0.13	0.012 / 0.12	0.0036	0.0036 U	**0.014**	0.0012 J	0.00092 J	0.0045	0.0037 U	0.0034 U	0.00074 J	0.0034 U	0.0035 U	0.0035 U	0.00045 J	0.0035 U	0.00088 J	0.60 U	0.0033 U	0.0034 U	0.0033 U	0.0032 U	0.0035 U	0.0034 U
Indeno[1,2,3-cd]pyrene [l]	0.13 / 0.13	0.12 / 1.2	0.0026 J	0.00076 J	0.014	0.00091 J	0.00079 J	0.0045	0.0037 U	0.0034 U	0.0033 U	0.0034 U	0.0035 U	0.0035 U	0.00050 J	0.0035 U	0.00080 J	0.0035 J	0.0033 U	0.0034 U	0.0033 U	0.0032 U	0.0035 U	0.0034 U
Dibenzo[a,h]anthracene [l]	0.13 / 0.13	0.012 / 0.12	0.00069 J	0.0036 U	0.0028 J	0.0036 U	0.0038 U	0.0029 J	0.0037 U	0.0034 U	0.0033 U	0.0034 U	0.0035 U	0.0035 U	0.0033 U	0.0035 U	0.0034 U	0.0034 J	0.0033 U	0.0034 U	0.0033 U	0.0032 U	0.0035 U	0.0034 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.003 J	0.00052 J	0.014	0.00093 J	0.0038 U	0.0047	0.0037 U	0.0034 U	0.0033 U	0.0034 U	0.0035 U	0.0035 U	0.00057 J	0.0035 U	0.0010 J	0.0038 J	0.0033 U	0.0034 U	0.0033 U	0.0032 U	0.0035 U	0.0034 U
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.25 U	0.30 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	1.3 U	0.25 U	0.25 U	0.5 U	0.25 U
TTEC [l]	NE / NE	0.012 / 0.12	0.005	0.004	**0.0197**	0.0023	0.0010	0.0071	0.0001	0.0002	0.0011	NA	NA	NA	0.00066	NA	0.0013	0.00069	NA	NA	NA	0.00016	NA	NA
Conventionals																								
Heterotrophic Plate Count (CFU/mL)			230	95.5	120	34.0	82.0	22.5	124	7.00	44.5	1.50	8.00 J	1.50	35.0 J	0.50 UJ	205	0.50 U	110	8.0	55.0	24.0	11.0	6.00
Hydrocarbon Degrading Bacteria (MPN/100 mL)			3,000 J	1,000 J	450,000	200 U	180 U	900 UJ	5,500 J	2,250	11,500	900 U	900 U	900 U	900 U	900 U	900 U	1,000	16,500	900 U	16,500	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.176	0.050 U	0.050 U	0.050 U	0.050 U	0.067	0.070	0.050 U	0.051	0.050 U	0.050 U	0.034 J	0.050 U	0.029 J	0.076	0.091	0.050 U	0.023 J	0.050 U	0.050 U	0.049 J	0.050 U
Phosphorus, Total (mg/L)			0.318	0.371	0.207	0.212	0.660	0.757	0.753	0.568	0.120	0.590	0.515	0.863	0.817	1.14	1.31	1.51	1.96	6.36	2.22	2.40	1.00	2.39
Sulfate as SO4 (mg/L)			10.4	11.2	9.78	6.8	1.54	0.97	0.87	0.87	0.83	0.58	0.39	0.46	0.34	0.44	0.20 U	0.20 U	0.69	0.20 U	0.27 J	0.91	0.17 J	0.20 J
Total Organic Carbon (TOC) (mg/L)			3.09	4.31	6.54	8.55	9.30	15.6	12.9	14.3	10.2	18.7	24.3	23.5	22.4	21.6	34.6	29.0	23.2	21.2	12	16.9	15.4	14.3

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[l] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-12																
Date Sampled:	MTCA	MTCA	5/3/2002	5/3/2002	9/11/2002	3/6/2003	9/12/2003	3/10/2004	9/10/2004	3/15/2005	9/21/2005	3/22/2006	9/27/2006	3/8/2007	6/8/2007	9/19/2007	3/26/2008	9/25/2008	3/19/2009	9/23/2009
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field Dup																
TPH (mg/L)																				
Diesel	1.0*	0.5*	0.667[e]	0.651[e]	0.250 U	0.26[g]	0.083 J	0.210 J	0.12 J	0.19 J	0.27 U	0.11 J	0.06 J	0.26 U	0.25 U	0.28 U	0.045 J	**0.58** [g]	0.27 U	0.27 U
Oil [§]	1.0*	0.5*	0.500 U	0.500 U	0.500 U	0.5 U	0.084 J	0.400 J	0.12 J	0.25 J	0.53 U	0.27 J	0.50 U	0.52 U	0.50 U	0.15 J	0.53 UJ	0.53 U	0.53 U	0.53 U
PAHs (ug/L)																				
Naphthalene	320 / 700	160 / 350	0.877	0.744	0.122	0.056	0.071 U	0.067 J	0.077	0.070 J	0.075 J	0.030	0.085	0.0094 J	0.0096 J	0.020 U	0.036 U	0.0067 J	0.17	0.0034 U
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	0.020 U	0.022 U	NA	0.02	0.011 J	0.12 U	0.0080 J	0.024	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.054	0.0034 U
Acenaphthylene	NE / NE	NE / NE	0.145	0.194	0.0934	0.041	0.0074 J	NA	0.023	0.0084 J	0.0077 J	0.012 J	0.0083 J	0.0061 J	0.020 U	0.0043 J	0.020 U	0.019 U	0.0026 J	0.0023 J
Acenaphthene	960 / 2,100	960 / 2,100	10.3	9.95	0.566	3.9	0.13	NA	0.28	0.039 J	0.12 U	0.030	0.081	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.027	0.0034 U
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	0.055	0.028	NA	0.012 J	0.0090 J	0.12 U	0.0071 U	0.018 J	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.038	0.029
Fluorene	640 / 1,400	640 / 1,400	2.01	1.98	0.0812	0.053	0.024	NA	0.011 J	0.0076 J	0.12 U	0.012 J	0.031	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.029	0.008
Phenanthrene	480 / 1,050	NE / NE	1.49	1.22	0.0495	0.36	0.074	NA	0.02 J	0.038 J	0.06 J	0.096	0.23	0.015 J	0.020 U	0.010 J	0.020 U	0.0091 J	0.029	0.006
Anthracene	4,800 / 10,500	4,800 / 10,500	0.505	0.418	0.0986	0.094	0.04	NA	0.053	0.10 J	0.067 J	0.14	0.099	0.076	0.051	0.065	0.051	0.063	0.03	0.033
Fluoranthene	640 / 1,400	640 / 1,400	0.215	0.165	0.172	0.17	0.034	NA	0.017 J	0.072 J	0.059 J	0.25	0.55	0.052	0.0055 J	0.014 J	0.013 J	0.0096 J	0.0068 U	0.0092
Pyrene	480 / 1,050	480 / 1,050	0.173	0.135	0.135	0.11	0.023	NA	0.014 J	0.066 J	0.062 J	0.22	0.54	0.044	0.0052 J	0.0071 J	0.012 J	0.013 J	0.017	0.021 J
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.0247 U	0.0244 U	0.0240 U	0.020 U	0.0032 J	0.089 J	0.005 J	0.029 J	0.019 J	**0.16**	**0.37**	0.019 J	0.0053 J	0.0057 J	0.0098 J	0.0077 J	0.0036 U	0.005
Chrysene[1]	0.13 / 0.13	12 / 120	0.0247 U	0.0244 U	0.0240 U	0.020 U	0.0051 J	0.085 J	0.012 J	0.049 J	0.034 J	**0.24**	**0.55**	0.034	0.020 U	0.020 U	0.0054 J	0.0068 J	0.0036 UJ	0.0044
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.0247 U	0.0244 U	0.0240 U	0.020 U	0.0021 J	NA	0.008 J	0.055 J	0.034 J	**0.26**	**0.66**	0.031	0.020 U	0.0031 J	0.0084 J	0.0095 J	0.0029 J	0.0099
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.0247 U	0.0244 U	0.0240 U	0.020 U	0.0021 J	NA	0.0077 J	0.031 J	0.01 J	**0.18**	**0.38**	0.020 J	0.020 U	0.020 U	0.020 UJ	0.019 U	0.00094 J	0.003 J
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.0247 U	0.0244 U	0.0240 U	0.020 U	0.0094 U	NA	0.003 J	0.032 J	0.019 J	**0.21**	**0.44**	0.019 J	0.020 U	0.020 U	0.0046 J	0.0081 J	0.0017 J	0.0063
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.0247 U	0.0244 U	0.0240 U	0.025	0.0094 U	NA	0.0044 J	0.032 J	0.018 J	**0.18**	**0.37**	0.018 J	0.020 U	0.020 U	0.0037 J	0.0079 J	0.0017 J	0.0067
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.0494 U	0.0488 U	0.0481 U	0.025	0.0094 U	NA	0.02 U	0.0066 J	0.0025 J	0.043	0.091	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.00046 J	0.0015 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0247 U	0.0244 U	0.0240 U	0.026	0.0094 U	NA	0.005 J	0.038 J	0.018 J	0.20	0.42	0.020 J	0.020 U	0.020 U	0.0039 J	0.0070 J	0.0036 U	0.0071
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.247 U	0.244 U	0.240 U	2 U	0.47 UJ	0.96 U	0.96 UJ	1.1 U	1.2 U	0.62 J	0.017 U	0.98 UJ	0.97 U	0.023 J	0.99 UJ	0.95 UJ	0.5 U	0.50 U
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.007	0.011	0.002	0.009
Conventionals																				
Heterotrophic Plate Count (CFU/mL)			1,200 J	550 J	28,000	189	1,880	795 J	45	700 J	135	740	720	490	4,100	65	44.0	58.5	47	165 J
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	1,300	25,000	11,000	50,000	50,000	90,000	500,000	110,000	2,600	150,000	11,000	15,000 J	≥ 8,000,000 J	9,740 J	1,000 J	8,000,000 J
Nitrate + Nitrite as N (mg/L)			NA	NA	0.243	0.2 U	0.6 J	0.8	0.3	0.3 U	0.32	0.29	1.69	1.44	0.78	0.19	0.14	0.37	0.05 U	0.022 J
Phosphorus, Total (mg/L)			NA	NA	0.155	0.03	1.68	1.01	0.66	4.9	0.63	0.09	0.40	0.01 U	0.04	0.01	0.01	0.02	0.02	0.017
Sulfate as SO4 (mg/L)			NA	NA	74.5	171	114	53.0	46.6	41.2 J	41.7	17.0	20.2	14.3	15.8	28.9	10.8	13.7	11.7	12.4
Total Organic Carbon (TOC) (mg/L)			NA	NA	5.11	2.8	21	3.4	2.6	4.0	1.9	1.7	1.7	1.3	0.9	1.0	2.0	1.2	1.4	2.22

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID: / Date Sampled: / QAQC:	Cleanup Level Through 2007 MTCA Mtd B / Mtd C	Cleanup Level Current (2017) MTCA Mtd B / Mtd C	AV-12 (continued) 3/17/2010	9/9/2010	3/8/2011	9/20/2011	3/14/2012	9/19/2012	3/14/2013	9/18/2013	3/6/2014	9/30/2014	3/3/2015	9/15/2015	3/23/2016	9/14/2016	3/23/2017	9/28/2017	3/21/2018	9/12/2018	3/20/2019	9/24/2019	4/2/2020	9/15/2020
TPH (mg/L)																								
Diesel	1.0*	0.5*	0.28 U	0.28 U	0.057 J	0.28 U	0.29 U	0.25 U	**0.82** [g]	0.28 U	0.077 J	0.13 J	0.083 J	0.19 J	0.081 J	0.26 U	0.27 U	0.25 U	0.26 U	0.14 J	0.26 UJ	0.25 U	0.098 J	0.25 U
Oil [§]	1.0*	0.5*	0.56 U	0.55 U	0.53 U	0.55 U	0.57 U	0.50 U	**0.80** [h]	0.079 J	0.065 J	0.27 J	0.085 J	**0.75** [k]	0.52 U	0.52 U	0.53 U	0.50 U	0.52 U	0.50 U	0.52 U	0.50 U	0.59 U	0.50 U
PAHs (ug/L)																								
Naphthalene	320 / 700	160 / 350	0.14	0.07	0.018	0.013	0.0061	0.0082	0.0039 J+	0.0060 J+	0.0035 J+	0.015	0.0096	0.0060 J	0.050	0.0094 J	0.015	1.0 U	0.030	0.0069	0.0074	0.0057	0.27	0.013
2-Methylnaphthalene	32 / 70	32 / 70	0.021	0.020	0.0037 U	0.0035 U	0.0035 U	0.0036	0.0033 U	0.0034 U	0.0033 UJ	0.0034 U	0.0035 U	0.0039	0.022	0.0052 J	0.0065 J	0.60 U	0.020	0.0035	0.0040 J	0.0033	0.059	0.0034 U
Acenaphthylene	NE / NE	NE / NE	0.0023 J	0.0024 J	0.0039	0.0055	0.0040	0.0040	0.0058	0.0071	0.0023 J	0.0056	0.0065	0.0043	0.0027 J	0.0046 J	0.0043	0.60 U	0.0033 U	0.0034	0.0025 J	0.0032 U	0.0062	0.0030 J
Acenaphthene	960 / 2,100	960 / 2,100	0.0061	0.011	0.0021 J	0.022	0.011	0.0021 J	0.0033 U	0.0034 U	0.00048 J	0.0021 J	0.0039 J	0.0057	0.012	0.0035 J	0.0063 J	0.10 J	0.0037	0.022	0.0032 U	0.0021 J	0.067	0.0012 J
Dibenzofuran	64 / 140	16 / 35	0.046	0.036	0.035	0.030	0.014	0.0034 U	0.0033 U	0.0034 U	0.0033 UJ	0.0018 J	0.0035 U	0.0061	0.0073	0.0051 J	0.0042 J	0.073 J	0.0033 U	0.0020 J	0.0032 U	0.0013 J	0.043	0.0034 U
Fluorene	640 / 1,400	640 / 1,400	0.011	0.015	0.0068	0.035	0.012	0.0048	0.0043 J+	0.0053 J	0.0023 J	0.0061	0.0055 J	0.0091	0.011	0.0085	0.0068	0.052 J	0.0064	0.0067 J	0.0054 J	0.0013 J	0.061	0.0047
Phenanthrene	480 / 1,050	NE / NE	0.0044 U	0.0064	0.0037 U	0.075	0.029	0.0055	0.0033 U	0.0051 J+	0.0033 UJ	0.0059 J+	0.0045 J	0.0046 J	0.0039 J	0.0067 J	0.0088	1.0 U	0.0033 U	0.0047 J	0.0032 U	0.0042 J	0.071	0.0057 J
Anthracene	4,800 / 10,500	4,800 / 10,500	0.053	0.036	0.079	0.078	0.085	0.092	0.13	0.15	0.057 J	0.13	0.11	0.085	0.048	0.081	0.12	0.085 J	0.090	0.073	0.068	0.0043	0.090	0.077
Fluoranthene	640 / 1,400	640 / 1,400	0.0099	0.0087	0.0037 U	0.023	0.026	0.012	0.0045 J+	0.0087	0.0033 UJ	0.0034 U	0.0035 U	0.0036 U	0.0034 U	0.0035 U	0.0086	0.0062 J	0.0033 U	0.015	0.0032 U	0.0032 U	0.027	0.0070
Pyrene	480 / 1,050	480 / 1,050	0.032	0.032	0.032	0.048	0.052	0.031	0.021	0.065	0.012 J	0.064	0.052	0.048	0.051	0.066 J	0.052	1.0 U	0.059	0.068	0.067	0.0018 J	0.073	0.074
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.0060	0.0042	0.0037 U	0.0044	0.012	0.0076	0.0025 J	0.0070	0.0019 J	0.0034 U	0.0035 U	0.0042 U	0.0034 U	0.0054 J	0.0058 J	0.60 U	0.0033 U	0.0051	0.0032 U	0.0032 U	0.0062 J	0.0034 U
Chrysene[1]	0.13 / 0.13	12 / 120	0.0051	0.0033 J	0.0020 J	0.0038	0.011	0.0066	0.0013 J	0.0060	0.0017 J	0.0035	0.0033 J	0.0030 J	0.0038	0.0035 U	0.0088	1.0 U	0.0028 J	0.0045	0.0019 J	0.0032 U	0.0030 J	0.0030 J
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.012	0.0069	0.0037 U	0.0072	0.024	0.014	0.0017 J	0.011	0.0030 J	0.0034 U	0.0035 U	0.0036 U	0.0031 J	0.0035 U	0.0092	0.60 U	0.0033 U	0.0022 J	0.0043	0.0032 U	0.0034 J	0.0034 U
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.0028 J	0.0024 J	0.0037 U	0.0018 J	0.0077	0.0048	0.0013 J	0.0045	0.0015 J	0.0034 U	0.0035 U	0.0036 U	0.00070 J	0.0035 U	0.0033 J	0.60 U	0.0033 U	0.0033 U	0.0029 J	0.0032 U	0.0035 U	0.0034 U
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.0072	0.0041	0.0037 U	0.0037	**0.014**	0.0089	0.0012 J	0.0081	0.0021 J	0.0034 U	0.0035 U	0.0036 U	0.0015 J	0.0035 U	0.0066	0.60 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.0035 U	0.0034 U
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.0065	0.0053	0.0037 U	0.0036	0.013	0.0087	0.00083 J	0.0077	0.0018 J	0.0034 U	0.0035 U	0.0036 U	0.0011 J	0.0035 U	0.0055	0.60 U	0.0033 U	0.0033 U	0.0026 J	0.0032 U	0.0035 U	0.0034 U
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.0014 J	0.00092 J	0.0037 U	0.0010 J	0.0032 J	0.0021 J	0.0033 U	0.0016 J	0.00052 J	0.0034 U	0.0035 U	0.0036 U	0.0034 U	0.0035 U	0.0012 J	0.60 U	0.0033 U	0.0033 U	0.0013 J	0.0032 U	0.0035 U	0.0034 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0065	0.0049	0.0037 U	0.0042	0.016	0.0088	0.00089 J	0.0080	0.0033 UJ	0.0034 U	0.00055 J	0.0036 U	0.0018 J	0.0035 U	0.0052	0.60 U	0.0033 U	0.0033 U	0.0019 J	0.0032 U	0.0035 U	0.0034 U
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U	0.30 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
TTEC[1]	NE / NE	0.012 / 0.12	0.010	0.006	0.00002	0.0055	**0.020**	**0.0127**	0.0018	0.011	0.0030	0.000035	0.000033	3.0E-05	0.0020	0.00054	0.0092	NA	0.000028	0.00078	0.0011	NA	0.00099	0.00003
Conventionals																								
Heterotrophic Plate Count (CFU/mL)			240	135	0.50 U	46.0	50.0	35.0	131	39.5	385	0.50 U	26.5 J	1.00	84.5	3.00 J	14.0	0.50 U	2.50	0.50	2.50	29.0	0.5 U	0.50
Hydrocarbon Degrading Bacteria (MPN/100 mL)			68,100 J	7,000 J	NA	17,000	200	2,250 J	6,500 J	900 U	13,500 J	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.069	0.050 UJ	0.050 U	0.037 J	0.050 U	0.029 J	0.050 U	0.073	0.050 U	0.050 U	0.050 U	0.050 U	0.059	0.050 U
Phosphorus, Total (mg/L)			0.028	0.045	0.045	0.033	0.022	0.102	0.063	0.057	0.016	0.039	0.065	0.217	0.104	0.173	0.226	0.222	0.215	0.223	0.246	0.388	0.302	0.286
Sulfate as SO4 (mg/L)			5.98	9.91	3.40	4.18	3.2	4.22	3.39	3.85	8.53	9.54	6.25	4.5	9.96	12.9	3.76	7.5	7.38	3.12	2.78	5.01	2.93	1.22
Total Organic Carbon (TOC) (mg/L)			1.51	2.94	2.82	2.45	1.12	3.61	1.19	3.86	1.87	5.86	5.87	11.6	6.95	6.78	16.2	12.0	9.26	13.1	3.3 J	19.0	15.5	17.8

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-13																			
Date Sampled:	MTCA	MTCA	5/3/2002	9/11/2002	3/6/2003	9/11/2003	3/10/2004	9/10/2004	3/15/2005	9/21/2005	9/21/2005 Field Dup	3/22/2006	3/22/2006 Field Dup	9/27/2006	9/27/2006 Field Dup	3/8/2007	3/8/2007 Field Dup	9/18/2007	9/18/2007 Field Dup	3/25/2008	3/25/2008 Field Dup	9/24/2008	9/24/2008 Field Dup
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																					
TPH (mg/L)																							
Diesel	1.0*	0.5*	0.909[e]	**2.40[e]**	**1.0[g]**	**1.7** [i]	**1.5** [g]	**1.1** [i]	**1.9** [g]	**0.63** [i]	**0.64** [i]	**1.3** [g]	**1.3** [g]	**0.80** [g]	**0.76** [g]	**0.36** [i]	**0.33** [i]	**0.51** [i]	**0.49** [i]	**0.38** J[g]	**0.35** J[g]	**0.36** [g]	**0.37** [g]
Oil [§]	1.0*	0.5*	0.500 U	**1.40[e]**	**0.83[b]**	0.43 J	0.92 [b]	0.6 [i]	**1.3** [b]	0.41 J	0.45 J	0.87 [g]	0.97 [g]	0.42 J	0.36 J	0.52 U	0.50 U	0.46 J	0.58 [i]	0.24 J	0.23 J	0.56 U	0.56 U
PAHs (ug/L)																							
Naphthalene	320 / 700	160 / 350	0.386	5.52	0.15	0.15 U	0.18 J	0.13	0.40	0.24	0.22	0.050 J	0.088 J	0.21	0.22	0.015 J	0.015 J	0.032	0.032	0.11	0.066	0.015 J	0.016 J
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	0.18	0.034 U	NA	0.032	0.033 J	0.11 U	0.12 U	0.0097 J	0.012 J	0.029	0.031	0.0049 J	0.0060 J	0.010 J	0.0052 J	0.011 J	0.0040 J	0.0056 J	0.0051 J
Acenaphthylene	NE / NE	NE / NE	0.0721	0.118 U	0.063	0.038	NA	0.077	0.092 J	0.052 J	0.049 J	0.075	0.091	0.062	0.068	0.036 J	0.040 J	0.045	0.042	0.022 U	0.020 U	0.021 J	0.019 J
Acenaphthene	960 / 2,100	960 / 2,100	4.60	4.28	5.3	5.3	NA	5.6	6.8	6.4	7.1	3.5	4.2	8.3	8.3	3.3 J	3.8 J	4.0	4.2	1.9	1.6	2.2	2.2
Dibenzofuran	64 / 140	16 / 35	NA	NA	0.064	0.027	NA	0.041	0.041 J	0.11 U	0.12 U	0.014 J	0.013 J	0.0091 J	0.011 J	0.013 J	0.010 J	0.020 U	0.0072 J	0.015 J	0.0093 J	0.023 U	0.020 U
Fluorene	640 / 1,400	640 / 1,400	0.642	0.678	0.65	0.44	NA	1.2	0.45	0.23	0.22	0.19	0.23	0.070	0.090	0.045 J	0.048 J	0.023	0.022	0.082	0.043	0.011 J	0.0093 J
Phenanthrene	480 / 1,050	NE / NE	0.0795	0.289	0.066	0.062	NA	0.14	0.11	0.04 J	0.043 J	0.036	0.029	0.028	0.031	0.024 J	0.033 J	0.026	0.034	0.021 U	0.020 U	0.0077 J	0.0081 J
Anthracene	4,800 / 10,500	4,800 / 10,500	0.129	0.121	0.13	0.054	NA	0.32	0.29	0.15	0.12	0.26	0.27	0.16	0.17	0.11 J	0.15 J	0.11	0.12	0.11	0.093	0.065	0.064
Fluoranthene	640 / 1,400	640 / 1,400	0.0242 U	0.118 U	0.020 U	0.02	NA	0.044	0.065 J	0.081 J	0.051 J	0.048	0.055	0.034	0.051	0.079 J	0.085 J	0.024	0.037	0.067	0.042	0.025	0.017 J
Pyrene	480 / 1,050	480 / 1,050	0.0242 U	0.118 U	0.020 U	0.0097	NA	0.03	0.039 J	0.068 J	0.037 J	0.036	0.041	0.029	0.037	0.053 J	0.057 J	0.0086 J	0.018 J	0.044	0.031	0.019 J	0.010 J
Benzo[a]anthracene[j]	0.13 / 0.13	0.12 / 1.2	0.0242 U	0.118 U	0.020 U	0.0094 U	0.051 J	0.02 U	0.0067 J	0.018 J	0.011 J	0.013 J	0.014 J	0.0088 J	0.014 J	0.014 J	0.015 J	0.020 U	0.0057 J	0.020 U	0.020 U	0.023 U	0.020 U
Chrysene[j]	0.13 / 0.13	12 / 120	0.0242 U	0.118 U	0.020 U	0.0094 U	0.042 J	0.02 U	0.0089 J	0.026 J	0.016 J	0.021	0.021	0.011 J	0.016 J	0.030 J	0.029 J	0.020 U	0.0068 J	0.020 U	0.020 U	0.023 U	0.020 U
Benzo[b]fluoranthene[j]	0.13 / 0.13	0.12 / 1.2	0.0242 U	0.118 U	0.020 U	0.0094 U	NA	0.02 U	0.11 U	0.025 J	0.12 U	0.016 J	0.016 J	0.0068 J	0.0047 U	0.028 J	0.031 J	0.020 U	0.020 U	0.020 U	0.020 U	0.023 U	0.020 U
Benzo[k]fluoranthene[j]	0.13 / 0.13	1.2 / 12	0.0242 U	0.118 U	0.020 U	0.0094 U	NA	0.02 U	0.11 U	0.11 U	0.12 U	0.015 J	0.014 J	0.0051 U	0.0052 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.023 U	0.020 U
Benzo[a]pyrene[j]	0.13 / 0.13	0.012 / 0.12	0.0242 U	0.118 U	0.020 U	0.0094 U	NA	0.02 U	0.11 U	0.11 U	0.12 U	0.011 J	0.0091 J	0.0043 U	0.0044 U	0.011 J	0.0085 J	0.020 U	0.020 U	0.020 U	0.020 U	0.023 U	0.020 U
Indeno[1,2,3-cd]pyrene[j]	0.13 / 0.13	0.12 / 1.2	0.0242 U	0.118 U	0.020 U	0.0094 U	NA	0.02 U	0.11 U	0.11 U	0.12 U	0.0086 J	0.0092 J	0.0050 J	0.0094 J	0.0075 J	0.0085 J	0.020 U	0.020 U	0.020 U	0.020 U	0.023 U	0.020 U
Dibenzo[a,h]anthracene[j]	0.13 / 0.13	0.012 / 0.12	0.0483 U	0.236 U	0.020 U	0.0094 U	NA	0.02 U	0.11 U	0.11 U	0.12 U	0.0017 U	0.0017 U	0.0036 U	0.0037 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.023 U	0.020 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0242 U	0.118 U	0.020 U	0.0094 U	NA	0.02 U	0.11 U	0.11 U	0.12 U	0.012 J	0.0086 J	0.0055 J	0.0069 J	0.0064 J	0.0090 J	0.020 U	0.020 U	0.020 U	0.020 U	0.023 U	0.020 U
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	0.242 U	1.18 U	2.0 U	0.47 UJ	0.96 U	1.0 UJ	1.1 U	1.1 U	1.2 U	0.64 J	0.63 J	1.0 U	1.1 U	0.99 UJ	0.96 UJ	1.0 UJ	1.0 UJ	0.99 UJ	0.99 UJ	1.2 U	1.0 U
TTEC[l]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals																							
Heterotrophic Plate Count (CFU/mL)			395	128	140	1,640	5,050 J	120	1,800 J	139	140	7,050	5,550	430	630	570	625	705	665	44.0	50.0	15.0	17.5
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	30.0	2,000	3,000	90,000	27,000	160,000	3,300	5,000	1,600,000 J	140,000 J	800 J	8,000 J	25,000	35,000	1,000 J	2,000 J	22,000 J	140,000 J	45,000 J	25,000 J
Nitrate + Nitrite as N (mg/L)			NA	0.00500 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.23	0.23	0.24	0.24	0.17	0.17	0.12	0.11	0.14	0.15	0.05 U	0.05 U	0.19	0.19
Phosphorus, Total (mg/L)			NA	0.0200 U	0.98	5.02	2.18	4.06	3.31	1.76	2.53	2.03	2.33	1.88	1.52	0.39 J	0.71 J	0.44	0.46	0.59	0.58	0.58	0.63
Sulfate as SO4 (mg/L)			NA	1.00 U	0.2	0.12 J	5.8	89.6	184 J	43.3	43.1	187	171	272	286	145	148	263	261	179	180	230	232
Total Organic Carbon (TOC) (mg/L)			NA	58.6	54	51	67	40.8	40.5	28	29	31	29	31	34	20.7	20.5	15.7	15.2	13.7	14.7	10.0	10.5

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-13 (continued)																		
Date Sampled:	MTCA	MTCA	3/19/2009	3/19/2009	9/23/2009	9/23/2009	3/16/2010	3/16/2010	9/9/2010	9/9/2010	3/8/2011	3/8/2011	9/20/2011	9/20/2011	3/14/2012	3/14/2012	9/20/2012	9/20/2012	3/14/2013	3/14/2013	9/18/2013	9/18/2013
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
TPH (mg/L)																						
Diesel	1.0*	0.5*	0.33 [g]	0.31 [g]	0.37 [g]	0.36 [g]	0.27 U	0.27 U	**2.5 J**[g]	0.26 UJ	0.15 J	0.13 J	**0.97 J**[g]	0.38 UJ	0.30 U	0.30 U	**1.0** [g]	**0.90 J**[g]	0.38 J[g]	**0.76 J**[g]	**1.8** [g]	**2.0** [g]
Oil [b]	1.0*	0.5*	0.56 U	0.56 U	0.52 U	0.56 U	0.53 U	0.53 U	0.52 U	0.52 U	0.48 U	0.52 U	**0.99 J**[k]	0.76 UJ	0.60 U	0.60 U	**0.75** [k]	**0.74 J**[k]	0.54 U	**0.79** [k]	**1.7** [k]	**1.9** [k]
PAHs (ug/L)																						
Naphthalene	320 / 700	160 / 350	0.27	0.17	0.0014	0.011	0.011	0.011	0.04	0.054	0.017	0.022	0.038	0.035	0.0097	0.0097	0.023 J	0.021 J	0.019	0.024	0.059	0.061
2-Methylnaphthalene	32 / 70	32 / 70	0.10	0.065	0.0039 U	0.0034 U	0.0034 U	0.0034 U	0.02	0.032	0.0033 U	0.0033 U	0.0052	0.0050	0.0039 U	0.0036 U	0.0047 J	0.0068 J	0.0048	0.0043	0.0098	0.011
Acenaphthylene	NE / NE	NE / NE	0.0076	0.0074	0.0078	0.0076	0.0078	0.0068	0.011	0.014	0.0052	0.0060	0.012	0.013	0.0036 J	0.0038	0.016	0.018	0.013	0.011	0.021	0.019
Acenaphthene	960 / 2,100	960 / 2,100	2.2	1.7	1.6	1.5	2.7	2.5	2.9	4.1	0.64	0.69	0.50	0.51	0.37	0.42	0.700	0.74	1.0	0.94	1.1	1.1
Dibenzofuran	64 / 140	16 / 35	0.065	0.046	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.026	0.035	0.011	0.012	0.067	0.044	0.014	0.014	0.0062	0.0070	0.0043	0.0060	0.0067 J+	0.0093
Fluorene	640 / 1,400	640 / 1,400	0.06	0.043	0.0076	0.0064	0.0074	0.0062	0.026	0.035	0.032	0.037	0.14	0.098	0.025	0.025	0.017	0.018	0.014	0.014	0.020	0.022
Phenanthrene	480 / 1,050	NE / NE	0.052	0.036	0.0047 U	0.0045 U	0.0077 U	0.011	0.024	0.032	0.012	0.013	0.29	0.22	0.064	0.072	0.0039 J	0.0059 J	0.0055 J	0.053 J	0.027	0.027
Anthracene	4,800 / 10,500	4,800 / 10,500	0.044	0.039	0.063	0.053	0.016	0.016	0.013	0.015	0.025	0.029	0.12	0.12	0.032	0.038	0.12	0.15	0.11	0.093	0.16	0.14
Fluoranthene	640 / 1,400	640 / 1,400	0.023	0.01 U	0.0061	0.0055	0.0071	0.0074	0.0017 J	0.0028 J	0.014	0.016	0.062	0.057	0.065	0.076	0.0041	0.0042	0.0048 J	0.069 J	0.051	0.049
Pyrene	480 / 1,050	480 / 1,050	0.019	0.0084	0.0087 J	0.0074 J	0.0075	0.0069	0.0027 J	0.0031 J	0.0098	0.012	0.035	0.038	0.046	0.055	0.0049	0.0060	0.0099 J	0.045 J	0.033	0.049
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.0046	0.0034 U	0.0025 J	0.0034 U	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.00093 J	0.0012 J	0.0036 U	0.0033 U	0.0097	0.012	0.0034 U	0.0034 U	0.0033 UJ	0.0096 J	0.0049	0.0074
Chrysene[1]	0.13 / 0.13	12 / 120	0.0066 J	0.0034 UJ	0.003 J	0.0034 U	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.0025 J	0.0023 J	0.0044 U	0.0033 U	0.020	0.023	0.0034 U	0.0034 U	0.0033 UJ	0.012 J	0.015	0.018
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.0058	0.0034 U	0.004	0.003 J	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.0015 J	0.0025 J	0.0036 U	0.0033 U	0.014	0.015	0.0034 U	0.0034 U	0.0033 U	0.0036 J	0.0084	0.013 J[m]
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.0017 J	0.0034 UJ	0.0015 J	0.0034 U	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.00086 J	0.0036 U	0.0033 U	0.0039 U	0.0047	0.0034 U	0.0034 U	0.0033 U	0.0019 J	0.0034 U	0.0034 UJ[m]
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.0030 J	0.00340 U	0.0026 J	0.0022 J	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0036 U	0.0033 U	0.0039	0.0043	0.0034 U	0.0034 U	0.0033 U	0.0017 J	0.0034 U	0.0034
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.0027 J	0.00059 J	0.0026 J	0.0034 U	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.00085 J	0.0033 U	0.0036 U	0.0033 U	0.0034 J	0.0036 J	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0013 J	0.0034 J
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.0007 J	0.0034 U	0.00071 J	0.0034 U	0.0034 U	0.0034 U	0.0036 U	0.0033 U	0.0033 U	0.0033 U	0.0036 U	0.0033 U	0.00084 J	0.0010 J	0.0034 U	0.0034 U	0.0033 U	0.0037 U	0.0034 U	0.00074 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0026 J	0.0034 U	0.0035 U	0.0034 U	0.0034 U	0.0034 U	0.0036 U	0.00046 J	0.00089 J	0.00067 J	0.0036 U	0.0033 U	0.0039	0.0041	0.0034 U	0.0034 U	0.0033 U	0.00086 J	0.00087 J	0.0031 J
Pentachlorophenol[b]	0.729 / 7.29	0.219 / 2.19	0.5 U	0.5 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TTEC[1]	NE / NE	0.012 / 0.12	0.005	0.0001	0.004	0.003	NA	NA	NA	NA	0.00068	0.00048	NA	NA	0.0069	0.0082	NA	NA	NA	0.0033	0.0016	0.0060
Conventionals																						
Heterotrophic Plate Count (CFU/mL)			1.0 J	5.0 J	9.5 J	3.0 J	540	440	21.0 J	10.5 J	134 J	15 J	46.0	16.5	600	755	0.50	0.50 U	291	278	16.5 J	6.00 J
Hydrocarbon Degrading Bacteria (MPN/100 mL)			1,000 U	1,000 U	1,000 UJ	450,000 J	2,000 J	5,810 J	8,350 J	4,600 J	NA	NA	200 U	200 U	180 U	180 U	900 UJ	900 UJ	1,000 J	900 UJ	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.05	0.07	0.087	0.083	0.164	0.177	0.076	0.015 J	0.087	0.083	0.121	0.117	0.098	0.095	0.151	0.150	0.214	0.208	0.052	0.050 U
Phosphorus, Total (mg/L)			0.67	0.65	0.598	0.611	0.694	0.685	0.677	0.700	0.825	0.827	1.54	1.68	1.72	1.64	2.32	2.47	1.96	1.98	1.87	2.02
Sulfate as SO4 (mg/L)			160	149	165	165	76	76	67.2	66.3	44.3	42.5	22.2	22.4	41.5	40.9	4.8	4.5	9.9	10.1	35.5	35.6
Total Organic Carbon (TOC) (mg/L)			13.4	13.5	11.0	10.7	8.65	8.82	8.13	8.24	8.90	8.36	32.1	30.5	8.70	8.6	39.1	38.2	24.8	26.1	40.8	39.0

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	AV-13 (continued)																										
Date Sampled:	MTCA	MTCA	3/6/2014	3/6/2014	9/30/2014	9/30/2014	3/3/2015	3/3/2015	9/14/2015	9/14/2015	3/23/2016	3/23/2016	9/14/2016	9/14/2016	3/22/2017	3/22/2017	9/28/2017	9/28/2017	3/21/2018	3/21/2018	9/12/2018	9/12/2018	3/20/2019	3/20/2019	9/24/2019	9/24/2019	4/2/2020	4/2/2020	9/15/2020	9/15/2020
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
TPH (mg/L)																													
Diesel	1.0*	0.5*	0.12 J	0.15 J	**0.56** [g]	**0.55** [g]	**0.69** [g]	**0.77** [g]	**1.2** [g]	**1.2** [g]	**0.60** [g]	**0.61** [g]	**2.7** [g]	**2.6** [g]	0.28 J[g]	0.27 U	**2.2** [g]	**2.2** [g]	**2.6** [g]	**2.6** [g]	**0.90** [g]	**0.64** [g]	**3.0 J**[g]	**3.0 J**[g]	**0.80** [g]	**0.84** [g]	**0.75** [g]	**0.99** [g]	**0.88** [g]	**1.2** [g]
Oil [§]	1.0*	0.5*	0.16 J	0.21 J	**0.94** [h]	**0.85** [h]	**0.73** [h]	**0.73** [h]	**1.8** [k]	**2.0** [h]	**0.96** [h]	**0.89** [h]	**4.0** [k]	**2.6** [k]	0.53 U	0.54 U	**1.5** [k]	**1.6** [k]	**3.0** [h]	**3.4** [k]	**1.2** [k]	**0.77 J**[k]	**3.3** [k]	**3.4** [k]	**0.70** [k]	**0.68** [k]	**0.63** [k]	**0.86** [k]	**0.81 J**[k]	**1.1** [k]
PAHs (ug/L)																													
Naphthalene	320 / 700	160 / 350	0.0057 J+	0.0057 J+	0.039	0.048	0.028	0.032	0.030 J	0.011 J	0.024	0.031	0.10 J	0.10 J	0.021	0.021	1.0 U	2.6 J	0.057 J	0.054 J	0.025 J	0.029 J	0.060 J	0.029 J	0.016	0.019	0.13	0.13	0.037	0.051
2-Methylnaphthalene	32 / 70	32 / 70	0.0033 U	0.0033 U	0.0046 J+	0.0048 J+	0.0057 J	0.0050 J	0.0034 U	0.0034 U	0.0097	0.0094	0.043	0.036	0.0062 J	0.0051 J	0.60 U	0.36 J	0.012	0.013	0.013	0.010	0.018 J	0.022	0.0066	0.0061	0.093 J	0.090 J	0.015	0.017
Acenaphthylene	NE / NE	NE / NE	0.0033 U	0.0036 J+	0.011	0.010	0.012	0.010	0.010	0.011	0.0086	0.0077	0.077	0.083	0.0073	0.0060	0.029 J	0.074 J	0.021 J	0.019 J	0.014	0.015	0.018	0.020	0.012	0.014	0.029	0.026	0.019	0.027
Acenaphthene	960 / 2,100	960 / 2,100	0.33	0.41	0.95	0.94	0.90	0.94	1.5	1.5	1.2	1.1	2.9 J	3.2 J	1.4	1.4	2.3	3.3 J	2.8	2.8	2.2	1.7	3.0	2.8	1.9	2.2	3.7	3.4	3.5	3.1
Dibenzofuran	64 / 140	16 / 35	0.0033 U	0.0033 U	0.0037	0.0033 J	0.0038 J	0.0039 J	0.0085	0.0077	0.0085	0.0074	0.027 J	0.029 J	0.0049 J	0.0038 J	0.010 J	0.28 J	0.023 J	0.0062 J	0.010	0.0074	0.0047 J	0.0054 J	0.0071	0.0066	0.14	0.13	0.020	0.017
Fluorene	640 / 1,400	640 / 1,400	0.0033 U	0.0033 U	0.0084	0.0086	0.0075 J	0.0063 J	0.015	0.014	0.018	0.016	0.088	0.073	0.0071	0.0066 J	0.026 J	0.39 J	0.025	0.015	0.025	0.020	0.020	0.018	0.015	0.016	0.24	0.210	0.057	0.052
Phenanthrene	480 / 1,050	NE / NE	0.0093	0.010	0.020	0.015	0.0036 U	0.0036 U	0.019	0.014	0.0067 J	0.0056 J	0.49	0.47	0.0057 J	0.0056 J	1.0 U	0.32 J	0.018 J	0.0080 J	0.011	0.0099	0.013	0.016	0.014	0.012	0.49	0.41	0.090 J	0.046 J
Anthracene	4,800 / 10,500	4,800 / 10,500	0.030	0.034	0.078	0.068	0.10	0.091	0.050	0.053	0.041	0.040	0.33	0.44	0.040	0.040	0.27 J	0.32 J	0.15	0.15	0.076	0.068	0.19	0.20	0.069	0.070	0.15	0.13	0.11	0.13
Fluoranthene	640 / 1,400	640 / 1,400	0.029	0.031	0.018	0.015	0.0096	0.0036 U	0.0034 U	0.0071 J	0.0038 J	0.0034 U	1.7	2.0	0.0053 J	0.0034 U	0.60 U	0.077 J	0.0033 U	0.0034 U	0.0078	0.0072	0.0069	0.0096	0.0086	0.0062 J	0.21	0.17	0.055	0.040
Pyrene	480 / 1,050	480 / 1,050	0.022	0.023	0.021	0.018	0.0079	0.0036 U	0.0082	0.0071	0.0061	0.0060	1.4 J	1.6 J	0.0085	0.0061 J	1.0 UJ	0.058 J	0.0033 U	0.0096	0.0086	0.0082	0.0071	0.0084	0.0067	0.0056	0.12	0.092	0.036	0.030
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	0.0024 J	0.0022 J	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0040 U	0.0040 U	0.0034 U	0.0034 U	**0.21**	**0.26**	0.0034 U	0.0034 U	0.60 UJ	12 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.030	0.023	0.0032 U	0.0068 U
Chrysene[l]	0.13 / 0.13	12 / 120	0.0054	0.0034	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.53	0.83	0.0019 J	0.0034 U	1.0 UJ	20 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.028	0.020	0.0032 U	0.0068 U
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	0.0041	0.0025 J	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0037	0.0019 J	**0.33**	**0.45**	0.0023 J	0.0019 J	0.60 U	0.053 J	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.017	0.012	0.0032 U	0.0068 U
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	0.0012 J	0.0010 J	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.095	0.10	0.00086 J	0.00065 J	0.60 U	12 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.0054	0.0038	0.0032 U	0.0068 U
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	0.0017 J	0.00076 J	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	**0.11**	**0.12**	0.0034 U	0.0034 U	0.60 U	12 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.0091	0.0067	0.0032 U	0.0068 U
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.10	0.11	0.00069 J	0.00076 J	0.60 U	0.022 J	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.0033 J	0.0036 J	0.0032 U	0.0068 U
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	**0.021 J**	**0.019 J**	0.0034 U	0.0034 U	0.60 U	12 U	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.0034 U	0.0034 U	0.0032 U	0.0068 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0033 U	0.0033 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0034 U	0.0034 U	0.0034 U	0.0034 U	0.098	0.10	0.00081 J	0.00075 J	0.60 U	0.016 J	0.0033 U	0.0034 U	0.0034 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U	0.0030 J	0.0023 J	0.0032 U	0.0068 U
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	0.50 U	0.50 U	0.25 U	0.25 U	0.30 U	0.30 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
TTEC[l]	NE / NE	0.012 / 0.12	0.0025	0.0014	NA	NA	NA	NA	NA	NA	0.00037	0.00019	**0.19**	**0.22**	0.00040	0.00033	NA	0.0075	NA	NA	NA	NA	NA	NA	NA	NA	0.015	0.011	NA	NA
Conventionals																													
Heterotrophic Plate Count (CFU/mL)			32.0	40.0	0.50 U	1.00	4.50 J	8.00 J	0.50	0.50 U	18.5	23.0	0.50 J	0.50 UJ	9.00 J	0.50 UJ	0.50 U	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	1.00 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Hydrocarbon Degrading Bacteria (MPN/100 mL)			2,250 J	2,250 J	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 U	900 UJ	3900 J	900 U	900 U	900 U	900 U	1,000	900 U	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.073	0.087	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.030 J	0.077	0.085	0.145	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.023 J	0.050 U	0.054	0.056	0.050 U	0.050 U
Phosphorus, Total (mg/L)			0.740	0.741	0.958	0.815	1.44	1.45	1.64	1.66	1.19	1.19	1.49	1.42	0.760	0.757	1.57	1.58	1.67	1.67	8.33	9.43	1.49	1.45	1.37	1.50	1.64	1.57	1.80	1.82
Sulfate as SO4 (mg/L)			6.44	7.85	4.00	3.76	0.48	0.48	4.6	3.2	0.62	0.54 J	0.49	0.50	0.26 J	0.22	0.12 J	0.50 U	0.14 J	0.15 J	0.17 J	0.19 J	0.50	0.51	5.33	3.62	0.39 J	0.39 J	0.41	0.42
Total Organic Carbon (TOC) (mg/L)			5.71	5.74	14.5	14.8	39.4	38.6	35.7	35.9	36	40	49.2	55	15.0	15.2	53	50	63.6	61	14	13	60	57	24.7	29.3	59	58	41.7	40.7

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respecti

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[l] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated val

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	99EA-3A																			
Date Sampled:	MTCA	MTCA	1/13/1999	1/13/1999	5/3/2002	9/11/2003	3/10/2004	9/10/2004	3/15/2005	9/21/2005	3/22/2006	9/27/2006	3/8/2007	6/8/2007	9/18/2007	12/19/2007	3/25/2008	3/25/2008	9/23/2008 [n]	3/19/2009	3/19/2009	9/23/2009	9/23/2009
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field Dup														Field Filtered			Field Filtered		Field Filtered
TPH (mg/L)																							
Diesel	1.0*	0.5*	0.87	0.95	**2.99**	0.34 [g]	0.400 [g]	0.22 J	0.49 [g]	0.33 [i]	0.43 [i]	0.15 J	0.25 U	0.25 U	0.25 U	0.36 [l]	0.19 J	0.22 J	0.12 J	0.27 [i]	NA	0.27 U	NA
Oil [§]	1.0*	0.5*	0.5 U	0.5 U	0.5 U	0.11 J	0.330 J	0.099 J	0.24 J	0.50 U	0.30 J	0.25 J	0.50 U	0.50 U	0.21 J	0.89 [k]	0.53 UJ	0.53 UJ	0.52 U	0.53 U	NA	0.53 U	NA
PAHs (ug/L)																							
Naphthalene	320 / 700	160 / 350	15	15	263	0.30 U	0.073 J	0.10	0.23	0.079 J	0.23	0.035 U	0.016 J	0.074	0.057	0.038 U	0.084	0.074	0.051 J	0.022 U	0.04 U	0.014	0.018
2-Methylnaphthalene	32 / 70	32 / 70	**193**	**179**	NA	8.4	NA	0.074	1.5	0.68	0.59	0.049	0.0091 J	0.012 J	0.023	0.0066 J	0.076	0.057	0.078 J	0.004 U	0.0095	0.02	0.012
Acenaphthylene	NE / NE	NE / NE	10 U	10 U	0.244 U	0.12	NA	0.083	0.090 J	0.071 J	0.21	0.060	0.089 J	0.029	0.025	0.047	0.035	0.027	0.19 UJ	0.022	0.01	0.013	0.0079
Acenaphthene	960 / 2,100	960 / 2,100	52	53	41.4	14	NA	10	9.3	8.1	7.1	4.5	0.57 J	2.2	1.6	0.12	3.7	2.8	3.6 J	0.33	0.3	1.4	0.98
Dibenzofuran	64 / 140	16 / 35	10 U	10 U	NA	1.5	NA	0.021 J	0.015 J	0.11 U	0.012 J	0.0098 J	0.013 J	0.0071 J	0.0093 J	0.018 J	0.018 J	0.020 U	0.034 J	0.014	0.014	0.0051	0.0035 U
Fluorene	640 / 1,400	640 / 1,400	10	11	7.43	3.7	NA	1.6	3.6	3.5	2.9	1.6	0.044 J	0.94	0.71	0.076	1.4	0.96	1.6 J	0.12	0.11	0.45	0.23
Phenanthrene	480 / 1,050	NE / NE	10	10	6.25	3.4	NA	0.83	0.38	0.098 J	0.12	0.058	0.13 J	0.026	0.051	0.57	0.37	0.031 U	0.78 J	0.27	0.034	0.1	0.0082
Anthracene	4,800 / 10,500	4,800 / 10,500	10 U	10 U	0.0574	0.063	NA	0.078	0.078 J	0.065 J	0.098	0.073	0.19 J	0.064	0.050	0.39	0.13	0.037	0.24 J	0.29	0.16	0.047	0.016
Fluoranthene	640 / 1,400	640 / 1,400	10 U	10 U	0.0258	0.15	NA	0.038	0.061 J	0.069 J	0.16	0.20	1.0 J	0.13	0.081	1.4	0.91	0.022	2.0 J	0.91	0.027	0.24	0.0092
Pyrene	480 / 1,050	480 / 1,050	10 U	10 U	0.0251	0.12	NA	0.033	0.050 J	0.074 J	0.16	0.18	0.83 J	0.096	0.055	1.2	0.83	0.011 J	1.8 J	0.86	0.023	0.18 J	0.0056 J
Benzo[a]anthracene [1]	0.13 / 0.13	0.12 / 1.2	10 U	10 U	0.0244 U	0.038	0.052 J	0.012 J	0.017 J	0.019 J	0.048	0.065	**0.20 J**	0.027	0.0096 J	**0.93**	**0.65**	0.020 U	**1.5 J**	**0.53**	0.020	**0.15**	0.0035 U
Chrysene [1]	0.13 / 0.13	12 / 120	10 U	10 U	0.0244 U	0.074	0.12	0.024	0.041 J	0.049 J	0.12	**0.19**	**0.66 J**	0.049	0.023	**1.0**	0.72	0.020 U	1.7 J	0.70 J	0.0038 J	0.17	0.00087 J
Benzo[b]fluoranthene [1]	0.13 / 0.13	0.12 / 1.2	10 U	10 U	0.0244 U	0.035	NA	0.02 J	0.037 J	0.042 J	0.12	**0.19**	**0.47 J**	0.090	0.023	**1.8**	**1.2**	0.020 U	**2.8 J**	**1.0**	0.0053	**0.28**	0.0035 U
Benzo[k]fluoranthene [1]	0.13 / 0.13	1.2 / 12	10 U	10 U	0.0244 U	0.071	NA	0.017 J	0.026 J	0.031 J	0.083	**0.13**	**0.37 J**	0.030	0.0054 J	**0.54**	0.36	0.020 U	0.84 J	0.29 J	0.0014 J	0.085	0.00076 J
Benzo[a]pyrene [1]	0.13 / 0.13	0.012 / 0.12	10 U	10 U	0.0244 U	0.045	NA	0.01 J	0.017 J	0.02 J	0.052	0.083	**0.15 J**	0.028	0.005 J	**1.2 J**	**0.84**	0.020 U	**1.9 J**	**0.66**	0.0021 J	**0.20**	0.0035 U
Indeno[1,2,3-cd]pyrene [1]	0.13 / 0.13	0.12 / 1.2	10 U	10 U	0.0244 U	0.027	NA	0.013 J	0.017 J	0.022 J	0.055	0.089	**0.18 J**	0.035	0.0075 J	**1.2**	**0.71**	0.020 U	**1.6 J**	**0.62**	0.0016 J	**0.19**	0.0035 U
Dibenzo[a,h]anthracene [1]	0.13 / 0.13	0.012 / 0.12	10 U	10 U	0.0488 U	0.0079 J	NA	0.0025 J	0.0026 J	0.0049 J	0.011 J	0.013 J	0.036 J	0.0058 J	0.020 U	**0.21**	**0.14**	0.020 U	**0.38 J**	**0.13**	0.0005 J	**0.042**	0.0035 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	10 U	10 U	0.0244 U	0.021	NA	0.012 J	0.018 J	0.028 J	0.052	0.085	0.15 J	0.030	0.0057 U	1.1	0.67	0.020 U	1.6 J	0.56	0.0036 U	0.17	0.0035 U
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	50 U	50 U	0.244 U	0.48 UJ	0.98 U	1.1 UJ	0.98 U	1.1 U	0.62 J	1.0 U	0.15 J	0.98 U	0.96 UJ	0.64 J	1.0 UJ	0.99 UJ	0.95 UJ	**1.1**	NA	0.50 U	NA
TTEC [1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.15**	NA	**2.63**	**0.924**	0.005	**0.276**	0.0001
Conventionals																							
Heterotrophic Plate Count (CFU/mL)			NA	NA	845	740	1,300 J	171	240 J	119	520	1,240 J	37,000	2,600	75	11,200	31.0	NA	21.5 J	4,300	NA	845 J	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	NA	300	30,000 J	33,000	96,000	160,000	110,000	14,000	250,000	5,500	5,500 J	800,000	≥ 8,000,000 J	NA	13,000 J	65,000 J	NA	1,000 UJ	NA
Nitrate + Nitrite as N (mg/L)			NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.16	0.14	0.09	0.03	0.10	0.11	0.05 U	0.05 U	NA	0.13 J	0.16	NA	0.066	NA
Phosphorus, Total (mg/L)			NA	NA	NA	0.97	0.51	0.57	0.46	0.42	0.33	0.37	0.06	0.36	0.39	0.02 J	0.42	NA	0.30	0.06	NA	0.452	NA
Sulfate as SO4 (mg/L)			7.1	5.2	NA	51	7.0	36.8	39.2 J	42.7	9.5	28.5	11.3	32.2	43.6	2.0	7.8	NA	23.5	4.5	NA	9.99	NA
Total Organic Carbon (TOC) (mg/L)			NA	NA	NA	10.9	11.7	5.6	6.5	4.1	6.3	4.5	3.8	5.2	4.1	2.3	8.0	NA	8.8	3.9	NA	9.32	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	99EA-3A (continued)																				
Date Sampled:	MTCA	MTCA	3/16/2010	9/9/2010	3/8/2011	9/20/2011	3/14/2012	9/19/2012	3/14/2013	9/18/2013	3/7/2014	9/30/2014	3/3/2015	9/14/2015	3/23/2016	9/14/2016	3/23/2017	9/28/2017	3/21/2018	9/12/2018	3/20/2019	9/25/2019	4/1/2020	9/15/2020
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																					
TPH (mg/L)																							
Diesel	1.0*	0.5*	0.27 U	0.29 U	0.14 J	0.30 U	0.28 U	0.27 U	0.28 [g]	0.28 U	0.46 [g]	**0.55** [g]	0.49 [g]	**0.78** [g]	0.15 J	**0.83** [g]	0.27 U	**0.59** [g]	0.26 U	**0.77** [g]	0.34 J[g]	**0.99** [g]	**0.29 U**	**1.1** [g]
Oil [§]	1.0*	0.5*	0.53 U	0.57 U	0.56 U	0.59 U	0.56 U	0.53 U	0.52 U	0.55 UJ	0.20 J	**0.62** [h]	0.18 J	**0.95** [h]	0.53 U	**0.57 J**[h]	0.54 U	**0.71 J** [h]	0.52 U	**0.65 J**[h]	0.55 U	**0.57 J** [h]	**0.57 U**	**0.62 J** [k]
PAHs (ug/L)																							
Naphthalene	320 / 700	160 / 350	0.012 U	0.045	0.018	0.029 J	0.021	0.022 J	0.023 J	0.020 J	0.089 J	0.035 J	0.069 J	0.025 J	0.028	0.10 J	0.022 J	1.0 U	0.044 J	0.038 U	0.028 J	0.12	0.0020 J	0.11
2-Methylnaphthalene	32 / 70	32 / 70	0.0051	0.027	0.0068	0.0046	0.011	0.0089	0.0059	0.0059 J+	0.014	0.0064 J+	0.012	0.0093	0.013	0.015	0.0096	0.60 U	0.020	0.012	0.0073 J	0.012	0.0074 J	0.012 J
Acenaphthylene	NE / NE	NE / NE	0.0099	0.012	0.013	0.0076	0.029	0.012	0.015	0.014 J	0.015	0.016	0.022	0.025	0.018	0.026	0.017	0.040 J	0.024 J	0.031	0.017	0.043	0.026	0.091
Acenaphthene	960 / 2,100	960 / 2,100	0.94	1.1	0.77	0.75	0.070	1.1	2.0	1.2	1.8	1.1	2.4	2.1	2.3	2.5 J	2.2	4.4	3.2	2.6	2.7	3.5	2.7	5.1
Dibenzofuran	64 / 140	16 / 35	0.0056	0.036	0.0051	0.033	0.066	0.0043	0.0034	0.0035 U	0.0098	0.024	0.0074 J	0.0088	0.0042	0.044	0.029	0.60 U	0.032	0.0061 J	0.0038 J	0.007	0.0037	0.0071 U
Fluorene	640 / 1,400	640 / 1,400	0.48	0.49	0.085	0.11	0.11	0.019	0.016	0.014	0.018	0.010	0.015	0.023	0.012	0.013	0.0069	0.020 J	0.0088	0.016	0.0098	0.021	0.016 J	0.046
Phenanthrene	480 / 1,050	NE / NE	0.094	0.21	0.11	0.22	0.58	0.031	0.015	0.020	0.022	0.0034 U	0.0034 U	0.017	0.011	0.0099	0.0060 J	1.0 U	0.0041 J	0.010	0.0094	0.01	0.0069	0.016
Anthracene	4,800 / 10,500	4,800 / 10,500	0.039	0.053	0.055	0.043	0.14	0.036	0.051	0.057	0.048	0.093	0.11	0.14	0.023	0.21	0.039	0.18 J	0.034	0.13	0.042	0.23	0.044	0.32
Fluoranthene	640 / 1,400	640 / 1,400	0.23	0.36	0.26	0.12	1.3	0.086	0.032	0.044	0.010	0.0082	0.020	0.019	0.018	0.013	0.0050 J	0.012 J	0.0052 J	0.013	0.016	0.012	0.0085	0.012
Pyrene	480 / 1,050	480 / 1,050	0.20	0.32	0.23	0.076	0.90	0.081	0.026	0.040	0.0095	0.0060	0.021	0.012	0.013	0.0068 J	0.0046 J	1.0 U	0.0046	0.0087	0.011	0.0089	0.0057	0.0079
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	**0.14**	**0.30**	**0.19**	0.022	**0.22**	0.050	0.017	0.024	0.0060	0.0034 U	0.011	0.0047	0.0099	0.0041 J	0.0034 U	0.60 U	0.0033 U	0.0038	0.0085	0.0032 U	0.0038 J	0.0071 U
Chrysene[1]	0.13 / 0.13	12 / 120	0.13	0.32	0.21	0.024	0.52	0.066	0.020	0.033	0.0092	0.0025 J	0.014	0.0096	0.012	0.0048	0.0041	1.0 U	0.0016 J	0.0053	0.010	0.0037	0.0038	0.0065 J
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	**0.27**	**0.55**	**0.34**	0.018	**0.49**	0.089	0.027	0.045	0.0069	0.0034 U	0.016	0.0096	0.019	0.0033 U	0.0032 J	0.60 U	0.0016 J	0.0046	0.016	0.0067	0.0061	0.0098 J
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.084	0.15	0.10	0.0053	0.11	0.028	0.0099	0.016	0.0022 J	0.0034 U	0.0037	0.0034 J	0.0050	0.0033 U	0.0010 J	0.60 U	0.0033 U	0.0033 U	0.0068	0.002 J	0.0017 J	0.0028 J
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	**0.19**	**0.38**	**0.23**	0.010	**0.11**	**0.063**	**0.020**	**0.028**	0.0031 J	0.0034 U	0.011	0.0043	0.010	0.0033 U	0.0014 J	0.60 U	0.0033 U	0.0020 J	0.0093	0.0037	0.0038	0.0036 J
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	**0.23**	**0.40**	**0.20**	0.0065	0.11	0.057	0.018	0.026	0.0035 U	0.0034 U	0.0089	0.0030 J	0.0094	0.0033 U	0.0011 J	0.60 U	0.00068 J	0.0033 U	0.0093	0.0029 J	0.0034 J	0.0023 J
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	**0.052**	**0.079**	**0.045**	0.0017 J	**0.022**	**0.012**	0.0038	0.0053	0.00051 J	0.0034 U	0.0019 J	0.0034 U	0.0024 J	0.0033 U	0.0034 U	0.60 U	0.0033 U	0.0033 U	0.0029 J	0.0032 U	0.0034 U	0.0071 U
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.22	0.36	0.20	0.0061	0.11	0.051	0.016	0.026	0.0035 U	0.0034 U	0.0088	0.0038	0.0091	0.0033 U	0.0012 J	0.60 U	0.0012 J	0.0033 U	0.0083	0.0031 J	0.0034 J	0.0020 J
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	0.50 U	0.50 U	0.50 U	0.081 J	**0.57**	0.50 U	0.50 U	0.50 U	0.25 U	0.25 U	0.30 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.5 U	0.25 U
TTEC[1]	NE / NE	0.012 / 0.12	**0.269**	**0.531**	**0.320**	**0.0156**	**0.210**	**0.0873**	**0.028**	**0.040**	0.0048	0.000025	**0.015**	0.0065	**0.015**	0.00046	0.0020	NA	0.00024	0.0029	**0.014**	0.0049	0.0053	0.0052
Conventionals																								
Heterotrophic Plate Count (CFU/mL)			4,000	280	16.0	6.00 J	500	71.0	66.0	445 J	2.00 J	1.00	6.00 J	71.0	23.0	1.00 J	4.50	0.50 U	5.50	7.00	42.0	15.0	4.00	14.0
Hydrocarbon Degrading Bacteria (MPN/100 mL)			19,100 J	6,500 J	NA	200	180	1,000 J	900 UJ	1,000	6,500	3,900 J	900 U	1,000	2,250	900 U	1,000	900 U	900 U	900 U	900 U	900 U	900 U	900 U
Nitrate + Nitrite as N (mg/L)			0.124	0.047 J	0.083	0.050 U	0.076	0.060	0.099	0.050 U	0.090	0.050 U	0.050 U	0.030 J	0.050 UJ	0.024 J	0.029 J	0.076	0.050 U	0.050 U	0.050 U	0.050 U	0.054 J	0.050 U
Phosphorus, Total (mg/L)			0.326	0.392	0.309	0.370	0.018	0.441	0.532	4.51	0.578	0.071	0.595	0.702	0.523	0.672	0.553	0.778	0.712 J	0.987	0.838	0.939	0.572 J	0.941
Sulfate as SO4 (mg/L)			14.0	11.5	21.4	7.9	0.51	20.3	26.9	16.2 J	21.3	53.2	43.2	32.0	3.4	98.2	2.00	93.2	6.51	83.5	4.16	59.4	0.51	38.3
Total Organic Carbon (TOC) (mg/L)			4.38	3.49	7.46	6.68	0.85	11.7	7.68	11.5	7.69	12.4	8.48	11.9	4.43	18.7	6.01	27	7.70	25	9.3	32.8	10.8	42.9

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007 MTCA	Cleanup Level Current (2017) MTCA	97-6A											
Date Sampled:			8/7/1998	12/3/1998	2/12/1999	5/19/1999	9/1/1999	11/30/1999	2/29/2000	6/6/2000	8/31/2000	11/28/2000	8/23/2001	9/10/2002	9/11/2003
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C													
TPH (mg/L)															
Diesel	1.0*	0.5*	**19.0**	**12.0**	**5.7**	**2.0**	**15.0**	**7.4**	**5.8**	**7.5**	**12.3**	**18.2**	**9.8**	**10.0**	**7.1**
Oil [§]	1.0*	0.5*	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.61	0.50 U	0.50 U	0.35 J
PAHs (ug/L)															
Naphthalene	320 / 700	160 / 350	**10,100**	**9,150**	**10,500**	**2,060 J**	**11,300**	**3,270**	0.1 U	**4,400**	**3,690**	**4,260**	**3,140**	**3,100**	**1,900**
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NE / NE	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	480 / 1,050	480 / 1,050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	1.0 U	1.0 U	1.0 U	**0.2 J**	10 U	1.0 U	**0.2**	**8.2**	0.378 U	**0.354**	**0.471**	**11.7**	**1.6**
Chrysene[1]	0.13 / 0.13	12 / 120	1.0 U	1.0 U	1.0 U	0.1 J	10 U	1.0 U	0.1 U	**7.6**	0.323 U	**0.315**	**0.469**	**9.87**	**1.6**
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	5.0 U	5.0 U	5.0 U	0.5 UJ	50 U	5.0 U	0.5 U	0.5 U	1.0 UJ	5.0 UJ	0.481 U	59.5 U	4.8 UJ
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals															
Heterotrophic Plate Count (CFU/mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate + Nitrite as N (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus, Total (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate as SO4 (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables downloaded July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	04-6A[j]																	
Date Sampled:	MTCA	MTCA	9/10/2004	9/10/2004	9/20/2005	9/20/2005	9/26/2006	9/26/2006	3/7/2007	6/7/2007	6/7/2007	6/7/2007	9/19/2007	9/19/2007	9/19/2007	12/19/2007	12/19/2007	12/19/2007	9/23/2008	9/23/2008
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field dup		Field dup		Field dup			Field Dup	Field Filtered		Field Dup	Field Filtered		Field Dup	Field Filtered		Field Dup
TPH (mg/L)																				
Diesel	1.0*	0.5*	**1.5** [i]	**1.5** [i]	**1.5** [i]	**1.6** [i]	0.73 [i]	0.73 [i]	0.29 [i]	0.71 [i]	0.73 [i]	0.67 [i]	**1.2** [g]	**1.2** [g]	**1.2** [g]	0.95 [i]	0.94 [i]	0.80 [i]	**1.1** [g]	**1.1** [g]
Oil [§]	1.0*	0.5*	0.11 J	0.13 J	0.52 U	0.53 U	0.50 U	0.52 U	0.52 U	0.50 U	0.50 U	0.50 U	0.34 J	0.21 J	0.19 J	0.53 U	0.52 U	0.53 U	0.22 J	0.21 J
PAHs (ug/L)																				
Naphthalene	320 / 700	160 / 350	26	26	260	240	1.4	1.5	0.82	15	15	14	120	120	110	82	79	64	16	17
2-Methylnaphthalene	32 / 70	32 / 70	0.93	1.2	**33**	23	0.044	0.061	0.0083 J	0.025	0.018 J	3.5 J	1.4	1.2	0.86	0.58	0.60	0.42	0.039	0.039
Acenaphthylene	NE / NE	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	64 / 140	16 / 35	63	**64**	62	58	37	43	20	31	36	29	59	59	43	42	45	34	**62**	**61**
Fluorene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	480 / 1,050	480 / 1,050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	**0.3**	**0.30**	**0.39**	**0.36**	**0.40**	**0.58**	**0.060**	**0.21**	**0.24**	0.026	**0.53**	**0.44**	0.045	**0.19**	**0.25**	0.049	**0.27**	**0.29**
Chrysene[l]	0.13 / 0.13	12 / 120	**0.29**	**0.29**	**0.37**	**0.34**	**0.43**	**0.59**	**0.062**	**0.19**	**0.20**	0.031	**0.36**	**0.31**	0.025	**0.16**	**0.22**	0.046	0.22	0.25
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	0.028	0.029	0.053	0.045	**0.26**	**0.27**	0.024	0.072	0.081	0.0073 J	**0.14**	0.12	0.0069 J	0.094 J	**0.17 J**	0.021 U	0.090	0.11
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	0.018 J	0.023	0.034 J	0.031 J	**0.17**	**0.20**	0.013 J	0.028	0.031	0.0050 J	0.044	0.037	0.0053 J	0.031	0.048	0.021 U	0.030	0.042
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	0.016 J	0.016 J	0.03 J	0.025 J	**0.21**	**0.22**	0.013 J	0.050	0.052	0.0054 J	0.067	0.057	0.0047 J	0.060	0.11	0.021 U	**0.067**	**0.082**
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	0.0029 J	0.0032 J	0.011 J	0.0076 J	**0.16**	**0.15**	0.0078 J	0.030	0.034	0.0047 J	0.031	0.029	0.021 U	0.044	0.084	0.021 U	0.044 J	0.060 J
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC[l]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.113**	**0.135**
Conventionals																				
Heterotrophic Plate Count (CFU/mL)			66	53	1,010 J	510 J	53	38	210	73.0 J	130 J	NA	590	880	NA	29	31	NA	NA	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			13,000	30,000	16,000 J	7,000 J	35,000	35,000	11,500 J	15,000	25,000	NA	8,500 J	15,000 J	NA	4,000	5,500	NA	NA	NA
Nitrate + Nitrite as N (mg/L)			0.2 U	0.2 U	0.13 U	0.13 U	0.07	0.07	0.07	0.09	0.11	NA	0.07	0.07	NA	0.05 U	0.05 U	NA	NA	NA
Phosphorus, Total (mg/L)			0.66	0.68	1.02	1.06	1.31	1.27	1.63	1.18	1.14	NA	0.53	0.57	NA	1.26 J	1.28 J	NA	NA	NA
Sulfate as SO4 (mg/L)			93.0	88.4	109	121	73.7	72.6	188	116	113	NA	161	163	NA	48.6	47.8	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)			6.6	6.8	6.8	6.9	7.0	6.7	5.0	5.8	5.9	NA	7.1	7.1	NA	5.3	5.4	NA	NA	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	04-6A[j] (continued)																	
Date Sampled:	MTCA	MTCA	3/18/2009	3/18/2009	9/23/2009	9/23/2009	3/17/2010	3/17/2010	9/8/2010	9/8/2010	3/9/2011	3/9/2011	9/20/2011	9/20/2011	3/14/2012	3/14/2012	9/20/2012	9/20/2012	3/13/2013	3/13/2013	9/18/2013	9/18/2013
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup		Field Dup
TPH (mg/L)																						
Diesel	1.0*	0.5*	NA	NA	**1.4** [g]	**1.3** [g]	NA	NA	**0.53** [i]	0.49 [i]	**0.91** [g]	**1.1** [g]	**1.7** [i]	**1.8** [i]	**0.92** [i]	**1.1** [i]	**3.0** [i]	**2.9** [i]	**1.9** [i]	**2.5** [i]	**3.3** [g]	**3.3** [g]
Oil [§]	1.0*	0.5*	NA	NA	0.52 U	0.52 U	NA	NA	0.56 U	0.55 U	0.55 U	0.55 U	0.55 U	0.59 U	0.55 U	0.63 U	0.53 U	0.52 U	0.53 U	0.52 U	**0.56** [h]	**0.63** [h]
PAHs (ug/L)																						
Naphthalene	320 / 700	160 / 350	50	44	32	32	21 J	0.18 J	22	22	22	26	140	130	19	20	**260**	**280**	**490 J**	**210 J**	**530**	**590**
2-Methylnaphthalene	32 / 70	32 / 70	1.4	1.30	0.39	0.42	0.68 J	0.024 J	0.19	0.23	NA	NA	4.8	4.8	0.48	0.5	11	11	**42 J**	16 J	31	**34**
Acenaphthylene	NE / NE	NE / NE	NA	NA	0.8	0.74	NA	NA	NA	NA	NA	NA	1.2	1.2	NA	NA	NA	NA	2.6	1.6	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	NA	NA	68	60	NA	NA	NA	NA	NA	NA	110	110	NA	NA	NA	NA	210 J	110 J	NA	NA
Dibenzofuran	64 / 140	16 / 35	**49**	**45**	**56**	**52**	**22 J**	0.012 J	**43**	**30**	NA	NA	**59**	**58**	**34**	**35**	**94**	**99**	**120 J**	**59 J**	**110**	**110**
Fluorene	640 / 1,400	640 / 1,400	NA	NA	24	18	NA	NA	NA	NA	NA	NA	51	49	NA	NA	NA	NA	140 J	62 J	NA	NA
Phenanthrene	480 / 1,050	NE / NE	NA	NA	5.9	5.6	NA	NA	NA	NA	NA	NA	9.9	9.9	NA	NA	NA	NA	210 J	18 J	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	NA	NA	3.3	3.0	NA	NA	NA	NA	NA	NA	3.8	3.6	NA	NA	NA	NA	27 J	3.5 J	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	NA	NA	3.8	3.4	NA	NA	NA	NA	NA	NA	4.7	4.6	NA	NA	NA	NA	84 J	5.2 J	NA	NA
Pyrene	480 / 1,050	480 / 1,050	NA	NA	1.6 J	1.4 J	NA	NA	NA	NA	NA	NA	2.1	2.1	NA	NA	NA	NA	51 J	2.6 J	NA	NA
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	**0.18**	**0.18**	**0.17**	**0.14**	**0.19 J**	0.023 J	**0.20**	**0.18**	0.11	**0.15**	**0.16**	**0.14**	**0.12**	**0.13**	**0.17**	**0.18**	**11 J**	**0.15 J**	**0.13**	**0.16**
Chrysene[l]	0.13 / 0.13	12 / 120	0.13 J	0.14 J	0.14	0.11	0.13 J	0.027 J	0.14	0.14	0.076	0.12	0.13	0.12	0.075	0.085	0.16	0.17	9.5 J	0.14 J	0.13	0.15
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	0.041	0.047	0.067 J	0.038 J	0.076 J	0.044 J	0.029	0.025	0.024 J	0.060 J	0.055	0.045	0.034	0.037	0.041	0.045	**5.1 J**	0.049 J	0.041	0.057
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	0.014 J	0.016 J	0.021	0.014	0.025 J	0.014 J	0.011	0.0078	0.0081 J	0.020 J	0.017	0.014	0.0084	0.013	0.016 J	0.016 J	**1.8 J**	0.022 J	0.020 J	0.028 J
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	**0.024**	**0.029**	**0.041 J**	**0.021 J**	**0.050**	**0.031**	**0.012**	0.0099	**0.013 J**	**0.037 J**	**0.033**	**0.028**	**0.017**	**0.021**	**0.026 J**	**0.029 J**	**3.4 J**	**0.034 J**	**0.024 J**	**0.034 J**
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	0.0067 J	0.012 J	0.026 J	0.0095 J	0.032	0.025	0.0042	0.0029 J	0.0053 J	0.022 J	0.015	0.015	0.0076	0.0086	0.009 J	0.010 J	**1.3 J**	0.021 J	0.015 J	0.022 J
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	0.0035 U	0.0025 J	0.0065 J	0.0024 J	0.0076	0.0057	0.001 J	0.00094 J	0.0013 J	0.0046 J	0.0039	0.0036 J	0.0018 J	0.0020 J	0.034 U	0.034 U	**0.36 J**	0.011 J	0.036 U	0.0087 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	NA	NA	0.0023 J	0.0076 J	NA	NA	NA	NA	NA	NA	0.014	0.013	NA	NA	NA	NA	0.96 J	0.021 J	NA	NA
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC[1]	NE / NE	0.012 / 0.12	**0.049**	**0.056**	**0.071**	**0.042**	**0.084**	**0.042**	**0.0379**	**0.0330**	**0.029**	**0.064**	**0.059**	**0.051**	**0.035**	**0.041**	**0.051**	**0.056**	**5.5**	**0.061**	**0.046**	**0.063**
Conventionals																						
Heterotrophic Plate Count (CFU/mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate + Nitrite as N (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus, Total (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate as SO4 (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007 MTCA	Cleanup Level Current (2017) MTCA	04-6A[j] (continued)																									
Date Sampled:	Mtd B / Mtd C	Mtd B / Mtd C	3/6/2014	3/6/2014 Field Dup	9/29/2014	9/29/2014 Field Dup	3/3/2015	3/3/2015 Field Dup	9/15/2015	9/15/2015 Field Dup	3/23/2016	3/23/2016 Field Dup	9/14/2016	9/14/2016 Field Dup	3/22/2017	9/27/2017	9/27/2017 Field Dup	3/21/2018	3/21/2018 Field Dup	9/12/2018	9/12/2018 Field Dup	3/21/2019	3/21/2019 Field Dup	9/24/2019	9/24/2019 Field Dup	4/1/2020	4/1/2020 Field Dup	9/14/2020	9/14/2020 Field Dup
QAQC:																												
TPH (mg/L)																												
Diesel	1.0*	0.5*	**4.1** [g]	**3.9** [g]	**8.1** [g] J	**6.3** [g]	**1.8** [g]	**1.6** [g]	**3.4** [g]	**3.8** [g]	**2.6** [i]	**2.8** [i]	**4.7** [g]	**4.8** [g]	**2.3** [g]	**3.7 J** [g]	**3.3 J** [g]	**2.0** [g]	**2.6** [g]	**7.0** [g]	**6.2** [g]	**4.0 J** [g]	**3.9 J** [g]	**5.0** [g]	**5.5** [g]	**2.5** [i]	**2.5** [i]	**4.5** [i]	**3.9** [i]
Oil [§]	1.0*	0.5*	**0.50 J**	0.48 J	**1.8** [h] J	**1.7** [h]	0.21 J	0.15 J	**1.2** [h]	**1.3** [h]	0.53 U	0.55 U	**0.88 J** [h]	**0.84 J** [h]	0.54 U	**0.79 J** [h]	**0.78 J** [h]	0.52 U	0.53 U	**0.98 J**	**0.81 J**	0.45 J	**0.56** [h]	**0.67 J** [h]	**0.71 J** [h]	0.54 U	0.55 U	**0.65 J** [h]	**0.60 J** [h]
PAHs (ug/L)																												
Naphthalene	320 / 700	160 / 350	**550**	**570**	**830**	**930**	3.2 J	56 J	**780**	**800**	**510**	**450**	**1,100 J**	**1,100 J**	**220**	**960**	**1,100**	**200 J**	**310 J**	**1100**	**1300**	**630**	**240**	**1200**	**1200**	**730**	**740**	**880**	**900**
2-Methylnaphthalene	32 / 70	32 / 70	18	18	**52**	**60**	6.9 J	12 J	**77**	**70**	**110**	**93**	**110**	**100**	**46**	**82**	**120**	**62 J**	**68 J**	**83**	**95**	**100**	**89**	**160**	**170**	**85 J**	**89 J**	**140**	**140**
Acenaphthylene	NE / NE	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	2.6	NA	NA	NA	NA	NA	2.0	2.1	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	160 J	160 J	NA	NA	NA	NA	NA	160	190	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	64 / 140	16 / 35	**120**	**120**	**160**	**170**	**59**	**63**	**120**	**100**	**66**	**63**	**94**	**93**	**68**	**71**	**110**	**74 J**	**70 J**	**90**	**110**	**67**	**64**	**140**	**150**	**59**	**62**	**88**	**97**
Fluorene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	89	87	NA	NA	NA	NA	NA	86	93	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	68	63	NA	NA	NA	NA	NA	76	77	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.7	9	NA	NA	NA	NA	NA	9.3	8.9	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	9.3	NA	NA	NA	NA	NA	20	18	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	480 / 1,050	480 / 1,050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.3	3.2	NA	NA	NA	NA	NA	12	9.3	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[a]anthracene[l]	0.13 / 0.13	0.12 / 1.2	0.10	0.10	**0.16**	**0.15**	0.093	0.11	**0.15**	**0.14**	0.066	0.072	**0.14 J**	**0.15 J**	0.089	**0.40**	**0.41**	**1.0** J	**0.92** J	**2.5**	**1.7**	**2.0**	**2.1**	**1.7**	**1.2**	**1.4**	**1.1**	**1.2**	**0.95**
Chrysene[l]	0.13 / 0.13	12 / 120	0.090	0.086	0.16	0.16	0.075	0.078	0.12	0.081	0.056	0.081	0.33 U	0.085 J	0.084	0.31	0.38	0.92 J	0.53 J	2.2	1.5	2.0	2.1	1.4	0.94	1.6	1.2	0.91	0.73
Benzo[b]fluoranthene[l]	0.13 / 0.13	0.12 / 1.2	0.037	0.034	0.033 J	0.035 J	0.017 J	0.036	0.028 J	0.032 J	0.016	0.032	0.33 U	0.33 U	0.024	**0.16 J**	0.0033 UJ	1.7 UJ	1.7 UJ	**1.1**	**0.74**	**0.93**	**1.0**	**0.81**	**0.58**	**0.78**	**0.66**	**0.55**	**0.43**
Benzo[k]fluoranthene[l]	0.13 / 0.13	1.2 / 12	0.011	0.010	0.016 J	0.011 J	0.0050 J	0.012 J	0.034 U	0.034 U	0.0049	0.018	0.33 U	0.33 U	0.0080	0.073	0.16 J	1.7 UJ	1.7 UJ	0.44	0.30	0.38	0.39	0.29	0.21	0.34	0.29	0.22	0.18
Benzo[a]pyrene[l]	0.13 / 0.13	0.012 / 0.12	**0.020**	**0.018**	**0.035** J	**0.043** J	0.0091 J	**0.023**	0.011 J	0.011 J	0.0075	**0.024**	0.33 U	0.33 U	**0.012**	**0.11**	**0.067**	1.7 UJ	1.7 UJ	**0.72**	**0.48**	**0.65**	**0.69**	**0.49**	**0.36**	**0.50**	**0.41**	**0.38**	**0.32**
Indeno[1,2,3-cd]pyrene[l]	0.13 / 0.13	0.12 / 1.2	0.010	0.0081	0.068 U	0.067 U	0.0039 J	0.017	0.034 U	0.034 U	0.0024 J	0.018	0.33 UJ	0.33 UJ	0.0027 J	0.034 J	0.025	1.7 UJ	1.7 UJ	**0.24**	**0.16**	**0.21**	**0.23**	**0.17**	**0.12**	**0.22 J**	**0.18 J**	**0.13 J**	**0.11 J**
Dibenzo[a,h]anthracene[l]	0.13 / 0.13	0.012 / 0.12	0.0023 J	0.0019 J	0.068 U	0.067 U	0.017 U	0.0042 J	0.034 U	0.034 U	0.00069 J	0.018	0.33 U	0.33 U	0.00077 J	0.066 U	0.0056	1.7 UJ	1.7 UJ	**0.064**	**0.043**	**0.064 J**	**0.064**	**0.047 J**	**0.037 J**	**0.063 J**	**0.055 J**	**0.036 J**	**0.033 J**
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.33 U	0.33 U	NA	NA	NA	NA	NA	0.20	0.13	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol[§]	0.729 / 7.29	0.219 / 2.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC[1]	NE / NE	0.012 / 0.12	**0.037**	**0.034**	**0.058**	**0.064**	**0.022**	**0.042**	**0.030**	**0.029**	**0.017**	**0.041**	**0.014**	**0.016**	**0.025**	**0.18**	**0.13**	**0.11**	**0.097**	**1.2**	**0.79**	**1.0**	**1.1**	**0.81**	**0.58**	**0.80**	**0.65**	**0.60**	**0.50**
Conventionals																													
Heterotrophic Plate Count (CFU/mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate + Nitrite as N (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus, Total (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate as SO4 (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	97-6.B															
Date Sampled:	MTCA	MTCA	8/7/1998	12/3/1998	2/12/1999	5/19/1999	9/1/1999	11/30/1999	2/29/2000	6/6/2000	8/31/2000	11/28/2000	8/23/2001	9/10/2002	9/12/2003	9/10/2004	9/20/2005	9/26/2006
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																
TPH (mg/L)																		
Diesel	1.0*	0.5*	**1.5**	**2.2**	**2.2**	**2.1**	0.45	0.26	**2.3**	**1.1**	**2.0**	**1.5**	0.97	0.60	0.26	0.38 [i]	0.29 [i]	0.21 J
Oil [§]	1.0*	0.5*	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.5 U	0.5 U	0.5 U	0.5 U	0.085 J	0.530 U	0.52 U
PAHs (ug/L)																		
Naphthalene	320 / 700	160 / 350	46.5	0.8 U	0.4	11.5 J	0.2	0.1 U	0.2 U	0.2 U	0.189 U	0.163 U	0.0482 U	0.0481 U	0.053 U	0.056	0.034 U	0.22
2-Methylnaphthalene	32 / 70	32 / 70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.027	0.021 U	0.056
Acenaphthylene	NE / NE	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	64 / 140	16 / 35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.016 J	0.021 U	0.019 J
Fluorene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	480 / 1,050	480 / 1,050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	**0.3**	**0.3**	**0.2**	**0.2** J	0.1 U	0.1	0.1	0.1	0.1 U	0.1 U	0.0482 U	0.024 U	0.02	0.02 J	0.020 J	**0.38**
Chrysene[1]	0.13 / 0.13	12 / 120	**0.3**	**0.2**	**0.2**	**0.2** J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.0482 U	0.024 U	0.022	0.021	0.021 J	**0.51**
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0081 J	0.013 J	**0.57**
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.008 J	0.010 J	**0.36**
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0051 J	0.010 J	**0.45**
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0024 J	0.0066 J	**0.35**
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	**0.8**	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.482 U	0.24 U	0.47 UJ	NA	NA	NA
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conventionals																		
Heterotrophic Plate Count (CFU/mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25 J	50
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	400	5,000
Nitrate + Nitrite as N (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.18	0.13
Phosphorus, Total (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.93	0.98
Sulfate as SO4 (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2 U	0.17 J
Total Organic Carbon (TOC) (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.8	8.3

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007 MTCA	Cleanup Level Current (2017) MTCA	97-6.B (continued)															
Date Sampled:			3/7/2007	6/7/2007	6/7/2007 Field Filtered	9/18/2007	9/18/2007 Field Filtered	12/18/2007	12/18/2007 Field Filtered	9/22/2008	9/23/2009	9/23/2009 Field Filtered	3/16/2010	9/8/2010	3/9/2011	9/20/2011	3/14/2012	9/20/2012
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																
TPH (mg/L)																		
Diesel	1.0*	0.5*	0.26 U	0.53 [i]	0.62 [i]	0.41 [i]	0.50 [i]	0.63 [i]	0.62 [i]	0.39	0.25 U	NA	NA	0.28 U	0.29 U	0.37 [g]	0.27 [g]	0.35 [g]
Oil [§]	1.0*	0.5*	0.52 U	0.52 U	0.52 U	0.47 J	0.11 J	0.72 [i]	0.59 U	0.26 J	0.50 U	NA	NA	0.56 U	0.57 U	0.56 U	0.50 U	0.52 U
PAHs (ug/L)																		
Naphthalene	320 / 700	160 / 350	1.3 J	130	160	0.45	0.37	0.44	0.38	0.06	0.01	0.014	0.18	0.0098 J	0.0047 U	30	0.0044	1.7
2-Methylnaphthalene	32 / 70	32 / 70	0.077 J	10 J	13	0.021	0.013 J	0.011 J	0.0095 J	0.0089 J	0.0034 U	0.0034 U	0.025	0.0026 J	NA	0.31	0.0036 U	2.8
Acenaphthylene	NE / NE	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	0.011	0.0089	NA	NA	NA	0.082	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	NA	NA	NA	NA	NA	NA	NA	NA	0.006	0.03 U	NA	NA	NA	4.4	NA	NA
Dibenzofuran	64 / 140	16 / 35	0.020 U	3.9	3.7	0.019 J	0.011 J	0.0099 J	0.0070 J	0.0096 J	0.0043	0.0028 J	0.012	0.0029 J	NA	0.79	0.0055	0.0094
Fluorene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	0.0065	0.0046	NA	NA	NA	0.82	NA	NA
Phenanthrene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	0.04	0.015	NA	NA	NA	0.43	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	NA	NA	NA	NA	NA	NA	NA	NA	0.095	0.081	NA	NA	NA	0.17	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	NA	NA	NA	NA	NA	NA	NA	NA	0.13	0.045	NA	NA	NA	0.12	NA	NA
Pyrene	480 / 1,050	480 / 1,050	NA	NA	NA	NA	NA	NA	NA	NA	0.11 J	0.034 J	NA	NA	NA	0.083	NA	NA
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	**0.26 J**	0.083	0.0066 J	0.020 J	0.020 U	0.049	0.020 J	**0.44**	0.088	0.024	0.038	0.050	0.021	0.033	0.015	0.0080
Chrysene[1]	0.13 / 0.13	12 / 120	**0.29 J**	0.12	0.0072 J	0.014 J	0.020 U	0.052	0.017 J	0.54	0.097	0.028	0.045	0.060	0.018	0.025	0.014	0.0084
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	**0.39 J**	**0.15**	0.0055 J	0.027	0.020 U	0.081	0.029	**0.70**	**0.17**	0.047	0.074	0.099	0.040	0.056	0.025	0.013
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	**0.25 J**	0.055	0.0029 J	0.0082 J	0.020 U	0.025	0.011 J	0.23	0.054	0.015	0.023	0.029	0.013	0.018	0.0079	0.0051
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	**0.34 J**	0.10	0.022 U	0.016 J	0.020 U	0.047	0.015 J	**0.55**	**0.12**	**0.031**	**0.053**	**0.067**	**0.025**	**0.039**	**0.020**	0.010
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	**0.25 J**	0.091	0.0054 J	0.014 J	0.020 U	0.034	0.024 U	**0.53**	0.11	0.028	0.044	0.071	0.022	0.032	0.017	0.0077
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	NA	**0.024**	0.0065	**0.013**	**0.013**	0.0046	0.0066	0.0030 J	0.0016 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	NA	NA	NA	NA	NA	NA	NA	NA	0.097	0.025	NA	NA	NA	0.030	NA	NA
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC[1]	NE / NE	0.012 / 0.12	NA	NA	NA	NA	NA	NA	NA	**0.745**	**0.166**	**0.043**	**0.073**	**0.0938**	**0.0352**	**0.0538**	**0.026**	**0.0136**
Conventionals																		
Heterotrophic Plate Count (CFU/mL)			4,100	885	NA	1,260	NA	3,950	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			2,500,000 J	65,000 J	NA	55,000 J	NA	150,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate + Nitrite as N (mg/L)			0.77	0.05 U	NA	0.12	NA	0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus, Total (mg/L)			0.26	0.61	NA	0.93	NA	1.15 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate as SO4 (mg/L)			8.3	0.86	NA	0.4	NA	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)			5.6	5.7	NA	10.1	NA	9.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Table A-10
Summary of Groundwater Sampling Results

Sample ID:	Cleanup Level Through 2007	Cleanup Level Current (2017)	97-6.B (continued)															
Date Sampled:	MTCA	MTCA	3/14/2013	9/18/2013	3/7/2014	9/30/2014	3/3/2015	9/14/2015	3/23/2016	9/14/2016	3/22/2017	3/22/2017 Field Dup	9/28/2017	3/21/2018	9/12/2018	3/21/2019	9/24/2019	4/1/2020	9/14/2020
QAQC:	Mtd B / Mtd C	Mtd B / Mtd C																	
TPH (mg/L)																			
Diesel	1.0*	0.5*	0.28 [g]	0.43 [g]	0.39 [g]	0.34 [g]	0.32 [g]	0.23 J	0.46 [g]	0.47 [g]	0.38 J [g]	0.42 J [g]	0.31 J [g]	0.39 [g]	0.29 UJ	0.44 J [g]	0.51 [g]	0.25 J	0.25 U
Oil [§]	1.0*	0.5*	0.50 U	0.54 UJ	0.18 J	0.39 [h]	0.11 J	0.17 J	0.55 U	0.50 U	0.53 U	0.53 U	0.50 U	0.50 U	0.57 UJ	0.54 U	0.50 U	0.56 U	0.50 U
PAHs (ug/L)																			
Naphthalene	320 / 700	160 / 350	0.49	0.87	5.0	0.039 J	0.054	0.016 J	5.4	0.11 J	0.62 J	1.1 J	0.22 J	0.041 J	0.026 J	0.059 J	0.033	0.017 J	0.0034 U
2-Methylnaphthalene	32 / 70	32 / 70	0.055	0.74	0.63	0.0046 J+	0.0096	0.0042 J	0.66	0.012	0.038	0.060	0.030 J	0.0080	0.0036	0.010 J	0.0068	0.0037 J	0.0034 U
Acenaphthylene	NE / NE	NE / NE	0.030	NA	NA	NA	NA	NA	NA	0.01	NA	NA	NA	NA	0.016	NA	NA	NA	NA
Acenaphthene	960 / 2,100	960 / 2,100	3.9	NA	NA	NA	NA	NA	NA	2.7 J	NA	NA	NA	NA	0.19	NA	NA	NA	NA
Dibenzofuran	64 / 140	16 / 35	0.073	0.0090	1.2	0.25	0.12	0.0086 J	1.3	0.012	0.11 J	0.22 J	0.26	0.0090	0.59	0.026	0.0036	0.0035 J	0.0034 U
Fluorene	640 / 1,400	640 / 1,400	0.024	NA	NA	NA	NA	NA	NA	0.031	NA	NA	NA	NA	0.015 J	NA	NA	NA	NA
Phenanthrene	480 / 1,050	NE / NE	0.045	NA	NA	NA	NA	NA	NA	0.046	NA	NA	NA	NA	0.0054 J	NA	NA	NA	NA
Anthracene	4,800 / 10,500	4,800 / 10,500	0.089	NA	NA	NA	NA	NA	NA	0.039	NA	NA	NA	NA	0.13	NA	NA	NA	NA
Fluoranthene	640 / 1,400	640 / 1,400	0.022	NA	NA	NA	NA	NA	NA	0.011	NA	NA	NA	NA	0.23	NA	NA	NA	NA
Pyrene	480 / 1,050	480 / 1,050	0.017	NA	NA	NA	NA	NA	NA	0.0078 J	NA	NA	NA	NA	0.14	NA	NA	NA	NA
Benzo[a]anthracene[1]	0.13 / 0.13	0.12 / 1.2	0.0038	0.0089	0.038	0.021	0.053	0.034 J	0.011	0.0033 U	**0.23 J**	0.025 J	0.066 U	**0.24**	0.0093	0.011	0.021	0.015	0.0034 U
Chrysene[1]	0.13 / 0.13	12 / 120	0.0049	0.010	0.035	0.0095	0.049	0.043 J	0.0055	0.0027 J	0.25 J	0.028 J	0.066 U	0.20	0.0041	0.012	0.025	0.015	0.0034 U
Benzo[b]fluoranthene[1]	0.13 / 0.13	0.12 / 1.2	0.0036	0.012	0.015	0.017	0.085	0.065 J	0.0066	0.0033 U	**0.30** J	0.039 J	0.066 U	**0.19**	0.0094	0.015	0.038	0.024	0.0034 U
Benzo[k]fluoranthene[1]	0.13 / 0.13	1.2 / 12	0.0013 J	0.0046	0.0053	0.0064	0.022	0.023 J	0.0016 J	0.0033 U	0.12 J	0.015 J	0.066 U	0.062	0.0032 J	0.0065 J	0.013	0.0084	0.00041 J
Benzo[a]pyrene[1]	0.13 / 0.13	0.012 / 0.12	0.0031 J	0.0086	0.010	**0.013**	0.069	0.048 J	0.0027 J	0.0033 U	**0.22 J**	**0.032 J**	0.066 U	**0.12**	0.0060	0.0079	0.031	0.019	0.0016 J
Indeno[1,2,3-cd]pyrene[1]	0.13 / 0.13	0.12 / 1.2	0.0023 J	0.0070	0.0054 J+	0.013	0.057	0.039 J	0.0019 J	0.0018 J	**0.14** J	0.025 J	0.066 U	0.084	0.0053	0.011	0.038	0.026 J	0.0032 J
Dibenzo[a,h]anthracene[1]	0.13 / 0.13	0.012 / 0.12	0.00045 J	0.0015 J	0.0013 J	0.0024 J	0.011	0.0098 J	0.00091 J	0.0033 U	**0.036 J**	0.0055 J	0.066 U	**0.018**	0.0034 U	0.0034 U	0.0062	0.0043	0.00045 J
Benzo[g,h,i]perylene	480 / 1,050	NE / NE	0.0022 J	NA	NA	NA	NA	NA	NA	0.0033 U	NA	NA	NA	NA	0.0048	NA	NA	NA	NA
Pentachlorophenol [§]	0.729 / 7.29	0.219 / 2.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TTEC[1]	NE / NE	0.012 / 0.12	0.0043	**0.012**	**0.017**	**0.019**	**0.092**	**0.066**	0.0050	0.00021	**0.31**	**0.043**	NA	**0.18**	0.0088	**0.012**	**0.043**	**0.027**	0.0024
Conventionals																			
Heterotrophic Plate Count (CFU/mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hydrocarbon Degrading Bacteria (MPN/100 mL)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate + Nitrite as N (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus, Total (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate as SO4 (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Bold indicates the detected analyte meets or exceeds the cleanup level (MTCA Method C for TWP wells, MTCA Method B for PCMP and MFA wells). Samples collected prior to 2008 are compared to the applicable cleanup levels through 2007. A solid line demarcates the transition from previous to current cleanup levels.

TWP Wells: AV-01, AV-02, AV-03, AV-04, AV-05, AV-06, AV-07, AV-08.

PCMP Wells: 97-6A, 04-6A, and 97-6B.

MFA Wells: AV-09, AV-10, AV-11, AV-12, AV-13, and 99EA-3A.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method B and C Groundwater values are from Ecology website CLARC tables dated July 2015 (https://fortress.wa.gov/ecy/clarc/CLARCDataTables.aspx), have been applied to data from 2008 forward, and are updated after each event.

*TPH diesel and oil range-hydrocarbon cleanup levels are based on the MTCA A value.

§ The laboratory reports non-detect values at the reporting limits and reports detections between the detection limit and reporting limit with a 'J' qualifier. Method detection limits for TPH-Oil and pentachlorophenol are 0.019 mg/L and 0.16 ug/L, respectively.

a: Sample not collected; product was present in the well.

b: Samples analyzed for hydrocarbon degrading bacteria were collected on 10/21/98.

c: Sample was recollected and reanalyzed for PAHs on 9/30/99.

d: Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel or possibly biogenic interference.

e: Detected hydrocarbons have non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.

f: Units for samples collected on 3/5/2003 are MPN/mL.

g: The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.

h: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.

i: The chromatographic fingerprint does not resemble a petroleum product.

j: Well 97-6.A was decomissioned after the March 2004 sampling event and replaced with Well 04-6A.

k: The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.

l: The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

m: The laboratory integrated and reported the results for benzo(b)fluoranthene and benzo(k)fluoranthene for sample AV-10 (3/25/08) as benzo(b)fluoranthene.

n: A sample was collected from 99EA-3A on both September 23 and September 24, 2008. Results for PAHs have been reported from the sample collected September 24, 2008. All other results have been reported from the sample collected September 23, 2008.

o: The laboratory integrated and reported the results for benzo[b]fluoranthene and benzo[k]fluoranthene for sample AV-14 (9/18/2013) as benzo[b]fluoranthene.

p: The laboratory integrated and reported the results for benzo[a]anthracene and chrysene for sample AV-08 (9/17/13) as chrysene.

[1] Carcinogenic PAHs (cPAHs) are assessed based on the calculated toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708(8). The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B or C cleanup levels for benzo(a)pyrene.

NA = Not analyzed (analyte not included in analyte list) or not applicable (TTEC)

NE = Not Established

U = Compound was analyzed for but not detected above the reporting limit shown.

UJ = Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

J = Estimated concentration

TPH = Total Petroleum Hydrocarbons

TTEC = Total Toxic Equivalent Concentration (sum of cPAH concentrations multiplied by their respective toxicity equivalency factors [TEFs] per WAC 173-340-708(8)(e))

PAHs = Polynuclear Aromatic Hydrocarbons

Appendix B

Post Construction Inspection Report Forms

Form 1: Site Inspection Report

Inspection Date: 1/16/2020 **Inspectors Name:** Edward LaCoy

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
			Action Required?				Action Required?		
	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 4/6/2020 **Inspectors Name:** Edward LeCoq

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
			Action Required?				Action Required?		
	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					Standing H2O off cap due to recent rain.
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓								Monitor blackberries
2. Woody Vegetation	✓								
B. Erosion	✓								
C. Settlement	✓								
D. Animal Burrowing Activity	✓								
E. Benchmarks	✓								
F. Debris, Litter, and Waste	✓								
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 3/25/2020 **Inspectors Name:** Edward LaCoy

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
			Action Required?				Action Required?		
	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 1/1/2020 **Inspectors Name:** [illegible]

Inspection Area	TWP Area: Adequate/ Stable	TWP Area: Inadequate/ Deteriorating	TWP Area: Action Required? Yes	TWP Area: Action Required? No	Maintenance Facility Area: Adequate/ Stable	Maintenance Facility Area: Inadequate/ Deteriorating	Maintenance Facility Area: Action Required? Yes	Maintenance Facility Area: Action Required? No	Comments/Notes
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓		—	✓	✓			✓	
2. Barbed Wire	✓		—	✓	✓			✓	
3. Fence Posts	✓		—	✓	✓			✓	
B. Site Access								✓	
1. Gate Locks	✓		—	✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓		—	✓	✓			✓	
E. Debris, Litter, and Waste	✓		—	✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓		—	✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓		—	✓					
B. Erosion	✓		—	✓					
C. Settlement	✓		—	✓					
D. Animal Burrowing Activity	✓		—	✓					
E. Benchmarks	✓		—	✓					
F. Debris, Litter, and Waste	✓		—	✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 5/6/2020 **Inspectors Name:**

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
			Action Required?				Action Required?		
	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	Adequate/ Stable	Inadequate/ Deteriorating	Yes	No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 6/18/2020 **Inspectors Name:** Edward LeCoq

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					Grass 20-34", monitoring blackberries
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 7/10/2020 **Inspectors Name:** Edward LeCoq

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					Mowed the cap w/ low ground pressure equipment
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 9/15/2020 **Inspectors Name:** Edward LeCoq

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	Requested Barrier Wall signs
D Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 9/15/2020 **Inspectors Name:** Edward L Coy

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					Cleaned up prior. Clean in debris
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 10/29/2020 **Inspectors Name:** Edward LeCoz

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence	✓			✓	✓			✓	
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts									
B. Site Access	✓			✓	✓			✓	
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste									
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System	✓			✓					
1. Vegetated swales/channels	✓			✓					
2. Culverts									
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation	✓			✓					
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste									
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 11/25/2020 **Inspectors Name:** Edward McCoy

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access	✓			✓	✓			✓	
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	Removed blown in debris
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Form 1: Site Inspection Report

Inspection Date: 12/30/2020 **Inspectors Name:** E Baker

Inspection Area	TWP Area				Maintenance Facility Area				Comments/Notes
	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	Adequate/ Stable	Inadequate/ Deteriorating	Action Required? Yes	Action Required? No	
FACILITY ACCESS									
A. Security Fence									
1. Chain Link Fence	✓			✓	✓			✓	
2. Barbed Wire	✓			✓	✓			✓	
3. Fence Posts	✓			✓	✓			✓	
B. Site Access									
1. Gate Locks	✓			✓	✓			✓	
2. Gate Operation	✓			✓	✓			✓	
C. Warning Signs	✓			✓	✓			✓	
D. Access Roads	✓			✓	✓			✓	
E. Debris, Litter, and Waste	✓			✓	✓			✓	
RUNON/RUNOFF CONTROL SYSTEMS									
A. Site Drainage System									
1. Vegetated swales/channels	✓			✓					
2. Culverts	✓			✓					
PCMP WELLS									
BIOSPARGING/VENTING SYSTEM									
BIOSPARGING/VENTING WELLS									
FINAL COVER/BARRIER WALL SYSTEM									
A. Vegetation									
1. Vegetative Cover	✓			✓					
2. Woody Vegetation	✓			✓					
B. Erosion	✓			✓					
C. Settlement	✓			✓					
D. Animal Burrowing Activity	✓			✓					
E. Benchmarks	✓			✓					
F. Debris, Litter, and Waste	✓			✓					
G. Other									
BUILDING EXTERIOR									

Notes:

Appendix C
Groundwater Sampling Forms

Monitoring Well Sampling Field Log

Page 1 of ____

Well Number: AV-09

Date: 4/11/2030

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: BD

Purge Method: Peristaltic Pump

Pump Intake Depth (ft btc): 15

Flow-Through Cell: Yes

Sampling Method: Low-Flow

Decontamination Method: Alconox & DI

Purge Water Disposition: Drum on Site

Field Conditions: 40°F cloudy

Comments:

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2"		Flush

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
19.25	10.90				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On 0935		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0935			10.90	12.45	1.07	0.06	10.65	-58	43.5	
0940			10.90	13.99	1.05	0.03	7.77	-65	52.7	
0945			10.90	14.06	1.06	0.00	7.21	-67	113.5	
0950			10.90	14.23	1.07	0.00	6.94	-63	21.5	
0955			10.91	14.34	1.07	0.00	6.85	-66	23.2	
1000			7.90	14.47	1.08	0.00	6.79	-69	18.9	
1005			10.90	14.48	1.08	0.00	6.76	-72	15.1	
			10.90	14.50	1.08	0.00	6.76	-74	15.3	
	Start Sampling		10.0							
	End Sampling		Final	Sample Number:						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Page 1 of ___

Well Number: AV-11

Date: 4/1/2020

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: EdLee

Purge Method: Pump

Pump Intake Depth (ft btc): 13

Flow-Through Cell: Y

Sampling Method: Low Flow

Decontamination Method: Alconox / DI Water

Purge Water Disposition: Drum on site

Field Conditions: 43°F, windy, cloudy / light rain

Comments:

Well Information

Well Diameter (In)	Screen Interval (ft bgs)	Stick-up or Flush
2		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.18	8.02				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (±3% S/cm)	D.O. (±10% mg/L)	pH (±0.1)	ORP (±10mv)	Turbidity (±10% NTUs)	Clarity/Color/ Remarks
1011	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1015		300	8.04	12.15	0.525	5.36	8.11	-61	46.9	
1020			8.05	13.53	0.476	2.17	7.01	-143	39.5	
1025			8.06	13.91	0.438	1.77	6.91	-153	40.1	
1030			8.08	14.03	0.425	1.69	6.88	-159	35.8	
1035			8.09	14.10	0.413	1.59	6.86	-163	45.1	
1040			8.08	14.14	0.413	1.52	6.84	-163	28.1	
1045			8.09	14.25	0.408	1.41	6.85	-165	11.8	
1050			8.08	14.27	0.404	1.36	6.85	-165	0.0	

EdLee

Start Sampling 1052

End Sampling 1100

Sample Number: AV-11

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Page 1 of ___

Well Number: AV-10

Date: 9/1/20

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: GD

Purge Method: Peristaltic Pump

Pump Intake Depth (ft btc): 12'

Flow-Through Cell: YES

Sampling Method: Low-Flow

Decontamination Method: Alconox + DI

Purge Water Disposition: Drum on site

Field Conditions: 45° Cloudy

Comments:

Oily Water/Sheen on Purge

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2"		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.12	12.85				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On	135	Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1140	0	150	12.35	13.26	1.33	0	6.65	-54	27.4	
1145			9.12	13.60	1.37	0	6.62	-76	24.1	
1150			9.13	13.70	1.34	0	6.63	-84	17.0	
1155			9.13	13.25	1.34	0	6.63	-90	16.2	
1200			9.13	13.97	1.35	0	6.63	-93	12.0	
1205			9.13	14.12	1.35	0	6.63	-96	11.6	
	0.5	150								
							BD			
	Start Sampling		1210							
	End Sampling		1235							
			Final	Sample Number:						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: 99-EA3A
Date: 4/1/20

Project Information	
Project Name:	IP Longview
URS Project Number:	
Sampling Information	
Field Team:	EA/[illegible]
Purge Method:	P. Pump
Pump Intake Depth (ft btc):	15'
Flow-Through Cell:	Y
Sampling Method:	Low Flow
Decontamination Method:	Alconox/DI Water
Purge Water Disposition:	[illegible]
Field Conditions:	
Comments:	

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2		Flush (circled)

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
20.45	10.21				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (μS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/Remarks
1144	Pump On		Initial 10.21	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1147		165	10.35	11.83	0.278	6.40	6.50	3	56.6	
1152			10.34	13.86	0.273	4.55	6.30	49	27.2	
1157			10.34	14.19	0.288	5.45	6.26	14	13.8	
1202			10.35	14.52	0.405	5.34	6.33	-27	9.5	
1207			10.35	14.68	0.455	4.63	6.37	-49	6.0	
1212			10.35	14.75	0.484	3.99	6.38	-53	5.7	
1217			10.35	14.70	0.503	3.99	6.39	-60	5.3	
1222			10.35	14.70	0.511	4.00	6.39	-70	4.4	

[illegible signature/initials]

Start Sampling	1224		
End Sampling	1248	Sample Number:	99-EA3A
		Final DTW	10.30

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: 97-6B

Page 1 of ___ **Date:** 4/1/20

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: BD

Purge Method: Peristaltic Pump

Pump Intake Depth (ft btc): 33

Flow-Through Cell: Yes

Sampling Method: Low-Flow

Decontamination Method: Alconox + DI

Purge Water Disposition: Drum on site.

Field Conditions: 50°F sun/Rain

Comments:

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
4"		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
57.50	8.90				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	500mL Amber	HCl	TPH (D/R)	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On	1410	Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1415			8.90	13.45	0.403	0.42	7.06	-57	7.2	
1420			8.93	13.33	0.400	0.00	7.06	-76	5	
1425			8.93	13.25	0.399	0.00	7.04	-84	3.6	
1430			8.93	13.24	0.399	0.00	7.03	-91	5	
1435			8.93	13.20	0.398	0.00	7.02	-93	2	
1440			8.93	13.12	0.398	0.00	6.99	-97	0.5	
	9	120								
							DD			
	Start Sampling	1440								
	End Sampling	1510	Final	Sample Number:						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: 04-6A

Date: 4/1/20

Project Information	
Project Name:	IP Longview
URS Project Number:	

Sampling Information	
Field Team:	BP
Purge Method:	Peristaltic Pump
Pump Intake Depth (ft btc):	24'
Flow-Through Cell:	Yes
Sampling Method:	Low-flow
Decontamination Method:	Alconox & DI
Purge Water Disposition:	Drum on site
Field Conditions:	80F Sunny
Comments:	0.076ft of DNAPL @ Bottom. Sucked out and put in drum w/ Alcon water. Pumped DNAPL out after taking samples.

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
4"		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
35.10	9.14				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	500mL Amber	HCl	TPH (D/R)	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (√-S/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On	1546	Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1552			9.14	14.41	0.450	0	6.70	-50	0	
1557			9.14	14.25	.450	0	6.67	-55	0	
1602			9.14	13.97	0.451	0	6.65	-61	0	
1607			9.14	13.84	0.452	0	6.64	-65	0	
	Start Sampling	1610								
	End Sampling	1630	Final							

Field Dupe: 97-6C, Sample time: 1640

Sample Number:

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: ~~AV-13~~ AV-13

Date: 4/2/20

Project Information

Project Name:	IP Longview
URS Project Number:	

Sampling Information

Field Team:	BD
Purge Method:	Peristaltic Pump
Pump Intake Depth (ft btc):	12.5
Flow-Through Cell:	yes
Sampling Method:	Low-Flow
Decontamination Method:	Alconox & DI
Purge Water Disposition:	Drum on Site
Field Conditions:	45°F cloudy
Comments:	

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2"		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.11	9.86				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On	1.36	Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0740			9.97	12.57	1.05	0	6.64	-1	30.6	
0745			9.97	13.27	1.04	0	6.63	-46	30.4	
0750			9.97	13.49	1.04	0	6.63	-64	28.0	
0755			9.97	13.70	1.04	0	6.64	-75	22.1	
0800			9.97	13.74	1.04	0	6.64	-84	15.4	
0805			9.97	13.78	1.04	0	6.64	-87	15.0	
0810			9.97	13.74	1.04	0	6.64	-90	14.0	
	12	225								
	Start Sampling	0815		Field Dup: AV-14: Sample Time - 0840 End 0910						
	End Sampling		Final	Sample Number:						

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: AV-12

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Date: 8/2/2005

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: SR, LEE

Purge Method: S. pump

Pump Intake Depth (ft btc): 13

Flow-Through Cell: 1

Sampling Method: Low Flow

Decontamination Method: Alconox / DI Water

Purge Water Disposition: Drum on site

Field Conditions: 80's °F, Lt rain

Comments:

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.50	9.89				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (µS /cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
0732	Pump On		9.89 Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0736		130	9.96	14.00	0.669	2.22	6.21	118	238	
0741			9.96	13.98	0.683	1.31	6.20	116	258	
0746			9.97	13.70	0.691	0.97	6.20	-6	259	
0751			9.95	13.57	0.696	0.87	6.19	-17	242	
0756			9.95	13.54	0.698	0.97	6.19	-24	219	
0801			9.95	13.41	0.703	0.91	6.18	-28	202	
0806			9.95	13.34	0.708	0.86	6.18	-32	229	
0811			9.95	13.42	0.712	0.82	6.18	-35	225	
0816			9.93	13.28	0.717	0.84	6.18	-37	237	
	Start Sampling	0818								
	End Sampling	0852		Sample Number:	AV12					
			9.90 Final							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: AV-09

Date: 9/14/20

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: AH EL

Purge Method: Low-Flow Peristaltic Pump

Pump Intake Depth (ft btc): 15'

Flow-Through Cell: Horiba

Sampling Method: Low Flow

Decontamination Method: Alconox ; DI water

Purge Water Disposition: Drum on site

Field Conditions: Smokey, 60°

Comments:

Sample @ 0955

light sheen in purge bucket.

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or (Flush)
2'	10-20	

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
19.25	12.62	6.63	1.12	1.12	3.38

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0908	0	175	12.65	14.72	0.989	0.00	8.45	-64	42.5	clear/yellow
0913	2	175	12.65	15.28	0.958	0.00	6.86	-75	47.8	SC
0918	2	175	12.66	15.56	0.948	0.00	6.62	-96	18.6	
0923	3	175	12.67	15.74	0.944	0.00	6.52	-108	4.9	
0928	4	175	12.67	16.24	0.935	0.00	6.48	-115	5.0	
0933	5	175	12.68	16.42	0.924	0.00	6.46	-118	4.6	
0938	6	175	12.70	16.43	0.916	0.00	6.43	-121	4.0	
0941	6.25	175	12.70	16.45	0.917	0.00	6.40	-122	4.0	
0944	6.50	175	12.71	16.47	0.915	0.00	6.39	-122	4.8	
0948	7.00	175	12.71	16.49	0.917	0.00	6.38	-123	3.7	
0951	8.00	175	12.71	16.48	0.917	0.00	6.37	-124	3.7	
0954	8.15	175	12.71	16.49	0.917	0.00	6.36	-124	3.0	

Actuator 9-14-20

Start Sampling 0955

End Sampling 1030

Final

Sample Number: AV-09

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

0.164 gal = 1 ct

Monitoring Well Sampling Field Log

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Well Number: AV-01

Date: 9/14/2020

Project Information	
Project Name:	IP Longview
URS Project Number:	

Sampling Information	
Field Team:	S. Slater
Purge Method:	P. Pump
Pump Intake Depth (ft btc):	12
Flow-Through Cell:	Y
Sampling Method:	Low Flow
Decontamination Method:	Alconox / DI Water
Purge Water Disposition:	Drum on site
Field Conditions:	60's F, Haze/smoke
Comments:	

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
4		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
19.95	14.21				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
0923	Pump On		14.21	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0928		85	14.33	14.13	1.00	0.00	6.92	-92	800+	Yellow orange
0933			14.44	14.31	1.02	0.00	6.47	-78	800+	
0938			14.52	14.19	1.01	0.00	6.45	-87	800+	
0943			14.55	14.21	0.989	0.00	6.45	-88	800+	
0948			14.57	14.24	0.979	0.00	6.45	-90	800+	
0953			14.58	14.24	0.974	0.00	6.44	-91	672	VC
0958			14.58	14.35	0.971	0.00	6.44	-93	553	
1003			14.58	14.39	0.965	0.00	6.43	-94	469	
1008			14.58	14.70	0.954	0.00	6.44	-94	401	
1013			14.59	14.84	0.941	0.00	6.43	-95	315	
1018			14.59	14.94	0.935	2.68	6.43	-95	270	
1023			14.60	15.01	0.934	2.04	6.43	-95	239	
1028			14.60	15.09	0.929	2.31	6.42	-95	185	
1033	5L.		14.60	15.17	0.926	2.07	6.42	-96	165	

Start Sampling	1035
End Sampling	1121
Final	14.61

Sample Number: AV-01

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy CI=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Page 1 of ____

Well Number: AV-11
Date: 9/14/20

Project Information	
Project Name:	IP Longview
URS Project Number:	

Sampling Information	
Field Team:	AN EL
Purge Method:	Low-Flow P-Pump
Pump/Intake Depth (ft btc):	10'
Flow-Through Cell:	YCS - Horiba
Sampling Method:	Low Flow
Decontamination Method:	Alconox / DI water
Purge Water Disposition:	Drum onsite
Field Conditions:	Smokey 60°

Comments:
Sampled @ 1150

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2	5-15	Flush (circled)

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.18	9.69	5.49	0.93		

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp (°C)	Conductivity (S/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1055	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1058	0	200	9.73	17.76	0.414	6.67	6.64	-17	2.1	Clear
1103	1.5	200	9.72	17.77	0.400	5.59	6.53	-50	0.4	
1108	2.5	200	9.72	17.80	0.382	4.76	6.55	-34	0.0	
1113	3	200	9.72	17.87	0.376	4.08	6.56	-103	0.0	
1118	3.5	200	9.72	17.93	0.374	3.44	6.57	-116	0.0	
1123	4.0	200	9.72	18.00	0.374	2.89	6.57	-123	0.0	
1128	4.5	200	9.72	18.07	0.372	2.44	6.58	-127	0.0	
1131	5.0	200	9.72	18.11	0.373	2.18	6.58	-131	0.0	
1134	5.5	200	9.72	18.17	0.371	1.96	6.59	-133	0.0	
1137	6.0	200	9.72	18.22	0.366	1.77	6.60	-136	0.0	
1140	6.25	200	9.72	18.28	0.368	1.62	6.60	-137	0.0	
1143	6.5	200	9.72	18.29	0.370	1.57	6.60	-137	0.0	
1146	6.75	200	9.72	18.31	0.369	1.54	6.60	-137	0.0	

AN 9-14-20

Start Sampling: 1150
End Sampling: 1230
Final
Sample Number:

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: AV-06

Page 1 of ___ Date: 9/14

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: [illegible]

Purge Method: Peristaltic pump

Pump Intake Depth (ft btc):

Flow-Through Cell: Y

Sampling Method: Low flow

Decontamination Method: Alconox / DI Water

Purge Water Disposition: Drum on site

Field Conditions: 60's °F, Hazy/Smoke

Comments:

Minimum purge rate on pump 125 mL/min

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
4		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
19.98	19.06				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1143	Pump On		19.06	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1200		25	19.20	18.59	0.919	0.00	6.55	-34	396	Clear/Brown
1205			19.21	18.50	0.923	0.00	6.52	-70	319	
1210			19.21	18.43	0.923	0.00	6.52	-75	251	
1215			19.21	18.43	0.925	0.00	6.52	-78	224	
1220		35	19.23	18.54	0.924	0.00	6.50	-78	201	
1225			19.25	18.60	0.923	0.00	6.50	-79	179	
1230			19.27	18.60	0.922	0.00	6.50	-80	158	
1235			19.28	18.63	0.922	0.00	6.50	-81	224	
1240			19.30	18.11	0.923	0.00	6.48	-81	182	
1245			19.31	18.82	0.923	0.00	6.48	-82	134	
1250			19.33	18.98	0.923	0.00	6.47	-82	113	
1255			19.36	19.12	0.922	0.00	6.47	-82	113	
1300			19.38	19.22	0.922	0.00	6.46	-82	110	
1305	2L		19.39	19.29	0.922	0.00	6.46	-83	125	
~~1310~~										
~~1315~~										
~~1320~~										

Start Sampling 1308

End Sampling

Sample Number: AV-06

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: AV-10
Date: 9/14/20

Project Information	
Project Name:	IP Longview
URS Project Number:	
Sampling Information	
Field Team:	Au EL
Purge Method:	Low-Flow P-Pump
Pump Intake Depth (ft btc):	12'
Flow-Through Cell:	Horiba
Sampling Method:	Low-Flow
Decontamination Method:	Alconox + D.I
Purge Water Disposition:	Drum onsite
Field Conditions:	Smokey, 60°

Comments:

Sampled @ 1335

brown foam/suds forming in purge bucket
medium/~~light~~ heavy sheen layer on top

Well Information		
Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush (circled: Flush)
2	5-15	

Well Volume Calculation					
Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.12	10.29	4.83	0.821		

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers				
Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp (°C)	Conductivity (S/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1245	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
~~1248~~	~~0~~			~~20.59~~	~~0.000~~	~~9.12~~	~~5.44~~	~~47~~	~~260~~	Cl, brownish/yellow
1257	0.5	175	10.50	21.18	0.903	1.32	6.34	-10	4.9	
1302	1.75	175	10.50	21.29	0.905	0.77	6.35	-42	3.2	
1307	2	175	10.50	21.41	0.909	0.50	6.40	-61	2.6	
1312	3.0	175	10.50	21.60	0.903	0.20	6.47	-78	1.2	
1317	3.25	175	10.48	21.66	0.906	0.19	6.50	-83	0.8	
1322	3.75	175	10.48	21.79	0.912	0.09	6.55	-90	0.6	
1325	4.5	175	10.46	21.88	0.914	0.05	6.56	-93	0.8	
1328	4.75	175	10.46	21.93	0.914	0.01	6.56	-94	0.6	
1331	5	175	10.46	22.04	0.914	0.00	6.56	-97	0.3	
1334	5.25	175	10.46	22.12	0.915	0.00	6.57	-98	0.0	

AT 9-14-20

Start Sampling: 1335
End Sampling: 1410
Final
Sample Number: AV-10

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Well Number: AV-02

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Date: 9/14/2022

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: [illegible]

Purge Method: Pump

Pump Intake Depth (ft btc): 22

Flow-Through Cell: Y

Sampling Method: Low flow

Decontamination Method: Alconox / DI Water

Purge Water Disposition: Drum on site

Field Conditions: 60s°F Haze/Smoke

Comments:

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
23.40	19.22				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1314	Pump On		19.22	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1317		250	19.25	18.03	0.905	0.00	6.09	-42	57.4	
1322			19.25	15.74	0.900	0.00	6.34	-54	45.8	
1327			19.24	15.35	0.904	0.00	6.31	-62	102	
1332			19.25	15.19	0.905	0.00	6.29	-65	105	
1337			19.24	15.20	0.903	0.00	6.27	-67	92.3	
1342			19.24	15.28	0.904	0.00	6.27	-69	97.8	
1347	BL		19.24	15.36	0.902	0.00	6.27	-71	98.0	

Start Sampling 1349

End Sampling 1403

19.22

Sample Number:

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: AV-08

Date: 9/14/2006

Project Information	
Project Name:	IP Longview
URS Project Number:	
Sampling Information	
Field Team:	[illegible]
Purge Method:	? Pump ?
Pump Intake Depth (ft btc):	17'
Flow-Through Cell:	
Sampling Method:	Low flow
Decontamination Method:	Alconox / DI Water
Purge Water Disposition:	Drum on site
Field Conditions:	60's Cloudy / Hazy
Comments:	

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
4		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
19.05	15.09				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservatives	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	500mL Poly	None	SO4	N
1	500mL Poly	H2SO4	NO3-NO2	N
1	500mL Poly	H2SO4	TOC	N
1	500mL Poly	H2SO4	Phosphorus	N
1	100mL	None	HPC	N
1	100mL	None	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1442	Pump On		15.09	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1444		280	15.05	21.35	0.816	0.00	6.42	6	11.7	
1449			15.05	20.17	0.815	0.00	6.28	-16	15.1	
1454			15.05	19.58	0.812	0.00	6.24	-57	55.9	
1459			15.05	19.23	0.850	0.00	6.21	-63	74.6	
1504			15.04	19.06	0.837	0.00	6.19	-65	73.5	
1509			15.05	18.90	0.854	0.00	6.18	-67	67.3	
1514	9L		15.05	18.74	0.837	0.00	6.18	-69	61.8	

Start Sampling 1516

End Sampling 1531

Final 15.05

Sample Number: AV-08

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: AV-12

Date: 9/15/2020

Project Information	
Project Name:	IP Longview
URS Project Number:	
Sampling Information	
Field Team:	E&Ltm
Purge Method:	P. Pump
Pump Intake Depth (ft btc):	13'
Flow-Through Cell:	Y
Sampling Method:	low flow
Decontamination Method:	Alconox/DI Water
Purge Water Disposition:	Drum on site
Field Conditions:	50s°F Hazy/Smoke
Comments:	

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush (circled: Flush)
2		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.50	10.99				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/Remarks
0930	Pump On		10.99	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0936		100	11.07	17.82	0.723	1.52	6.38	1	93.6	
0941			11.07	17.92	0.713	1.00	6.18	-14	84.2	
0946			11.08	17.93	0.715	1.14	6.17	-23	82.6	
0951			11.08	18.02	0.719	0.85	6.16	-31	85.8	
0956			11.09	18.07	0.722	0.67	6.16	-36	75.2	
1001			11.10	18.12	0.724	0.46	6.17	-39	77.6	
1006			11.10	18.14	0.725	0.29	6.17	-43	85.7	
1011			11.10	18.15	0.726	0.19	6.17	-44	79.2	
1016			11.11	18.20	0.726	0.02	6.17	-46	76.7	
1021	5L		11.11	18.23	0.726	0.00	6.17	-47	77.7	

Start Sampling: 1023

End Sampling: 1101

Final

Sample Number: AV-12

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: 97-6B

Date: 9/14/20

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: AU EL

Purge Method: Low Flow P-Pump

Pump Intake Depth (ft btc): 25'

Flow-Through Cell: Horiba

Sampling Method: Low Flow

Decontamination Method: Alconox + D.I

Purge Water Disposition: Drum on site

Field Conditions: Smoky 60s

Comments:

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
4		C

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
57.50	9.43	48.07	0.66	31.72	95.17

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	500mL Amber	HCl	TPH (D/R)	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (S/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1450	Pump On		Initial		±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1453	0	160	9.42	23.66	0.308	1.13	6.99	-18	3.4	C
1458	1.75	160	9.42	22.00	0.313	0.00	7.02	-18	1.8	
1503	2	160	9.42	21.22	0.316	0.00	6.99	-13	0.0	
1508	2.25	160	9.42	20.66	0.319	0.00	6.96	-12	0.0	
1513	2.75	160	9.42	20.28	0.320	0.00	6.95	-12	0.0	
1518	3.25	160	9.42	19.93	0.323	0.00	6.94	-12	0.0	
1523	3.75	160	9.42	19.77	0.324	0.00	6.94	-12	0.0	
1526	4.25	160	9.42	19.55	0.326	0.00	6.93	-12	0.0	
1529	5.0	160	9.42	19.50	0.326	0.00	6.93	-12	0.0	
1532	5.25	160	9.42	19.50	0.326	0.00	6.93	-12	0.0	
	Start Sampling 1535									
	End Sampling		Final	Sample Number: 97-6B						

9/14/20

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy CI=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

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Well Number: 04-6A

Date: 9/14/20

Project Information	
Project Name:	IP Longview
URS Project Number:	

Sampling Information	
Field Team:	AM EL
Purge Method:	Low-flow pump
Pump Intake Depth (ft btc):	30'
Flow-Through Cell:	Meriden
Sampling Method:	Low-flow
Decontamination Method:	Alconox : D.I.
Purge Water Disposition:	onsite Drum
Field Conditions:	Smoky 60s

Comments:
04-6A Sampled @ 1745
Trace sheen film on top of purge water

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or (Flush)
4	25 35	

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
35.10	10.06	25.04	16.52	16.52	49.57

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	500mL Amber	HCl	TPH (D/R)	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (S/cm)	D.O (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
1700	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
1704	0	200	10.09	20.79	0.384	0.96	6.77	24	7.0	AC yellowish
1709	0.75	200	10.09	21.05	0.411	0.00	6.42	39	0.0	
1714	1.5	200	10.09	20.71	0.423	0.00	6.35	18	0.0	
1719	2.25	200	10.09	20.21	0.429	0.00	6.33	-13	0.0	
1724	3.0	200	10.09	19.89	0.433	0.00	6.31	-30	0.0	
1729	4.0	200	10.11	19.69	0.434	0.00	6.30	-41	0.0	
1734	4.75	200	10.11	19.51	0.436	0.00	6.30	-47	0.0	
1737	5.25	200	10.11	19.45	0.437	0.00	6.30	-51	0.0	
1740	5.76	200	10.11	19.40	0.437	0.00	6.29	-54	0.0	
1743	6.0	200	10.11	19.39	0.437	0.00	6.29	-54	0.00	

9/14/20

	Start Sampling	1745		Field Dupe: 97-6C, Sample time		1645				
	End Sampling			Sample Number:	04-6A					
			Final							

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Page 1 of ___

Well Number: AV-13

Date: 9/15/20

Project Information

Project Name: IP Longview

URS Project Number:

Sampling Information

Field Team: AM EL

Purge Method: Low Flow

Pump Intake Depth (ft btc): 12'

Flow-Through Cell: Horiba

Sampling Method: Low Flow

Decontamination Method: Alconox + D.I.

Purge Water Disposition: Drum on site

Field Conditions: Smoky 60°

Comments:

Sampled AV-13 @ 0855

Light sheen film in purge bucket with foam/suds as well

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2	5-15	

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
15.11	10.97	4.14	0.17	0.70	2.11

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp. (°C)	Conductivity (/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
0807	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0808	0	200	11.08	17.76	0.915	2.32	6.20	128	9.4	SC yellowish
0813	1	200	11.08	17.85	1.05	0.00	6.22	96	5.5	
0818	2	200	11.09	17.98	1.05	0.00	6.24	5	4.5	
0823	3	200	11.09	18.07	1.03	0.00	6.24	-39	4.5	
0828	4	200	11.03	18.15	1.03	0.00	6.24	-57	4.3	
0833	5	200	11.09	18.20	1.03	0.00	6.24	-68	4.3	
0838	6	200	11.09	18.26	1.02	0.00	6.24	-74	4.3	
0841	6.25	200	11.09	18.29	1.02	0.00	6.24	-77	4.2	
0844	7	200	11.09	18.33	1.02	0.00	6.25	-80	4.4	
0847	7.5	200	11.09	18.36	1.02	0.00	6.25	-83	4.6	
0850	8	200	11.09	18.39	1.02	0.00	6.25	-85	4.7	
0853	8.5	200	11.09	18.40	1.02	0.00	6.25	-85	4.6	

3 Volumes

Start Sampling	0855	Duplicate Sample Volume: AV-14 Sample time:	0755
End Sampling	0940	Sample Number:	AV-13
	Final		

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Monitoring Well Sampling Field Log

Page 1 of ____

Well Number: 99-EA3A

Date: 9/15/2020

Project Information

Project Name:	IP Longview
URS Project Number:	

Sampling Information

Field Team:	EA Crew
Purge Method:	P. Pump
Pump Intake Depth (ft btc):	16'
Flow-Through Cell:	Y
Sampling Method:	Low flow
Decontamination Method	Alconox / DI Water
Purge Water Disposition:	Drum on site
Field Conditions:	50's F Haze/Smoky

Comments:

Well Information

Well Diameter (in)	Screen Interval (ft bgs)	Stick-up or Flush
2		

Well Volume Calculation

Well Depth (ft btc)	DTW (ft btc)	Water Column (ft)	Convert Factor (gal/ft)	One Well Volume (gal)	Three Well Volumes (gal)
20.45	11.51				

3/4"=0.023 gal/ft 2"=0.17 gal/ft 4"=0.66 gal/ft 6"=1.5 gal/ft

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	1L Amber	None	PAH-ULL	N
2	40mL VOA	None	PCP	N
2	500mL Amber	HCl	TPH (D/R)	N
1	125mL Poly	None	SO4	N
1	125mL Poly	H2SO4	NO3-NO2	N
-	Incl.	H2SO4	TOC	N
-	Incl.	H2SO4	Phosphorus	N
1	100mL	Na2S2O3	HPC	N
1	100mL	Na2S2O3	HDB	N

Well Purge Data

Time	Volume Purged (L)	Purge Rate (mL/m)	DTW (ft btc)	Temp (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
0804	Pump On		11.51	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
0807		175	11.59	16.48	1.15	6.30	6.21	78	198	
0812			11.60	16.14	1.25	5.86	6.22	-48	106	
0817			11.60	16.05	1.31	4.31	6.21	-71	51.8	
0822			11.60	16.02	1.35	3.60	6.21	-79	55.7	
0827			11.59	15.99	1.360	2.97	6.21	-84	58.9	
0832			11.59	15.98	1.37	2.69	6.22	-86	55.1	
0837			11.61	15.98	1.37	2.29	6.22	-87	58.2	
0842			11.61	15.98	1.37	1.96	6.23	-89	63.9	
0847			11.62	15.97	1.36	1.61	6.23	-90	15.6	
0852	9L		11.62	15.98	1.360	1.35	6.23	-91	16.7	

Start Sampling 0854

End Sampling 0915

11.63

Sample Number: 99-EA3A

Note: bgs= below ground surface btc=below top of casing DTW=depth to water

Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Appendix D

Laboratory Analytical Results and Chain-Of-Custody Forms

ALS Environmental
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April 23, 2020

Analytical Report for Service Request No: K2002766

Paul Kalina
AECOM
1111 Third Avenue, Suite 1400
Seattle, WA 98101

RE: IP Longview / 60608686

Dear Paul,

Enclosed are the results of the sample(s) submitted to our laboratory April 01, 2020
For your reference, these analyses have been assigned our service request number **K2002766.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

ALS Environmental
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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental

Case Narrative

ALS Environmental—Kelso Laboratory
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www.alsglobal.com

ALS Environmental

Client: AECOM/URS Corporation
Project: IP Longview
Sample Matrix: Water

Service Request: K2002766
Date Received: 04/01/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Four water samples were received for analysis at ALS Environmental on 04/01/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

No significant anomalies were noted with this analysis.

Semivoa GC:

No anomalies.

General Chemistry:

Method 353.2, 04/06/2020: The matrix spike recoveries of Nitrate+Nitrite as Nitrogen for sample 99-EA3A were outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outliers suggested a potential low bias in this matrix. No further corrective action was appropriate.
Method 365.3, 04/09/2020: The matrix spike recoveries of Total Phosphorus for sample 99-EA3A were outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outliers suggested a potential low bias in this matrix. No further corrective action was appropriate.

Approved by Noe D. Oan Date 04/23/2020

ALS Environmental

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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ALS Environmental

CHAIN OF CUSTODY

102305

001

SR#

COC Set 1 of 1

COC#

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

K2002746

Project Name: FP Longview	Project Number: 60608606
Project Manager: Paul Kalina	
Company: AECOM	
Address:	
Phone #:	email: paul.kalina@aecom.com
Sampler Signature: [signature]	Sampler Printed Name: Edward Kathy LeCoz III

CLIENT SAMPLE ID	LABID	Sampling Date	Sampling Time	Matrix	NUMBER OF CONTAINERS	24H: SM 9215 B / Het Plate	48H: ApplEnvMic12-90-3895-3896 /	7D: 8151A Modified / PCP	7D: 8270D / PAH SIM ULL	14D: NWTPH-Dx / NW_TPH	28D: 300.0 / SO4	28D: 353.2 / NO2 NO3 T	28D: 365.3 / Phos T	28D: 415.1 / TOC T	1 HPB	2	3	4	5	Remarks
1. AV-09		4/1/20	1010	W	10	X		X	X	X	X	X	X	X	X					
2. AV-11		4/1/20	1052	W	10	X		X	X	X	X	X	X	X	X					
3. AV-10		4/1/20	1210	W	10	X		X	X	X	X	X	X	X	X					
4. GQ-8&3A		4/1/20	1224	W	10	X		X	X	X	X	X	X	X	X					
5.																				
6.																				
7.																				
8.																				
9.																				
10.																				

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#______

Bill To:______

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

X Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____ (Circle One)

Special Instructions/Comments:

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature [signature]	Signature Cody Graves	Signature	Signature	Signature	Signature
Printed Name Edward LeCoz	Printed Name ALS	Printed Name	Printed Name	Printed Name	Printed Name
Firm AECOM	Firm 4/1/2020 1346	Firm	Firm	Firm	Firm
Date/Time 4/1/20 1346	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC Ok

Cooler Receipt and Preservation Form

Client Accom Service Request K20 20766

Received: 4/1/2020 Opened: 4/1/2020 By: CG Unloaded: 4/1/2020 By: CG

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____

   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample 1	Sample 2	Sample 3	Sample 4	IR GUN	Cooler / COC ID NA	Tracking Number NA	Filed
2.9					3980H88WS	102305		
0.6								

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N

   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

ALS Environmental

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/1/20
Sample Matrix:	Water	**Date Received:**	04/1/20
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Sulfate

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2002766-001	**0.49**	0.40	0.04	2	04/02/20 19:31	
AV-11	K2002766-002	**0.17 J**	0.40	0.04	2	04/02/20 19:41	
AV-10	K2002766-003	**0.56**	0.40	0.04	2	04/02/20 19:52	
99-EA3A	K2002766-004	**0.51**	0.40	0.04	2	04/02/20 20:03	
Method Blank	K2002766-MB	ND U	0.20	0.02	1	04/02/20 10:30	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Analyzed:**	04/02/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Sulfate

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	675616

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002766-LCS	4.98	5.00	100	90-110

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/1/20
Sample Matrix:	Water	**Date Received:**	04/1/20
Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-09	K2002766-001	**0.023 J**	0.050	0.020	1	04/06/20 14:26	4/6/20	
AV-11	K2002766-002	**0.049 J**	0.050	0.020	1	04/06/20 14:26	4/6/20	
AV-10	K2002766-003	**0.052**	0.050	0.020	1	04/06/20 14:26	4/6/20	
99-EA3A	K2002766-004	**0.054**	0.050	0.020	1	04/06/20 14:26	4/6/20	
Method Blank	K2002766-MB	ND U	0.050	0.020	1	04/06/20 14:26	4/6/20	

ALS Group USA, Corp.
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QA/QC Report

ient:	AECOM/URS Corporation	**Service Request:**	K2002766
rroject	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
		Date Analyzed:	04/06/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	99-EA3A	**Units:**	mg/L
Lab Code:	K2002766-004	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2002766-004DUP Result	Average	RPD	RPD Limit
Nitrate+Nitrite as Nitrogen	353.2	0.050	0.020	0.054	0.055	0.0545	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

sults flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
		Date Analyzed:	04/6/20
		Date Extracted:	04/6/20

Duplicate Matrix Spike Summary
Nitrate+Nitrite as Nitrogen

Sample Name:	99-EA3A	**Units:**	mg/L
Lab Code:	K2002766-004	**Basis:**	NA
Analysis Method:	353.2		
Prep Method:	Method		

		Matrix Spike K2002766-004MS			**Duplicate Matrix Spike** K2002766-004DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate+Nitrite as Nitrogen	0.054	0.808	1.00	75 *	0.819	1.00	77 *	90-110	3	20

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ALS Group USA, Corp.
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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Analyzed:**	04/06/20
Sample Matrix:	Water	**Date Extracted:**	04/06/20

Lab Control Sample Summary
Nitrate+Nitrite as Nitrogen

Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	676326

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002766-LCS	11.3	11.5	98	90-110

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/1/20
Sample Matrix:	Water	**Date Received:**	04/1/20
Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Phosphorus, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-09	K2002766-001	**0.520**	0.020	0.004	1	04/09/20 17:53	4/8/20	
AV-11	K2002766-002	**1.00**	0.040	0.008	2	04/09/20 17:53	4/8/20	
AV-10	K2002766-003	**0.590**	0.020	0.004	1	04/09/20 17:53	4/8/20	
99-EA3A	K2002766-004	**0.572**	0.020	0.004	1	04/09/20 17:53	4/8/20	
Method Blank	K2002766-MB	ND U	0.020	0.004	1	04/09/20 17:53	4/8/20	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
		Date Analyzed:	04/09/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	99-EA3A	**Units:**	mg/L
Lab Code:	K2002766-004	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2002766-004DUP Result	Average	RPD	RPD Limit
Phosphorus, Total	365.3	0.020	0.004	0.572	0.585	0.579	2	20

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Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
		Date Analyzed:	04/9/20
		Date Extracted:	04/8/20

Duplicate Matrix Spike Summary
Phosphorus, Total

Sample Name:	99-EA3A	**Units:**	mg/L
Lab Code:	K2002766-004	**Basis:**	NA
Analysis Method:	365.3		
Prep Method:	Method		

		Matrix Spike K2002766-004MS			Duplicate Matrix Spike K2002766-004DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Phosphorus, Total	0.572	0.770	0.400	49 *	0.752	0.400	45 *	60-135	9	20

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Analyzed:**	04/09/20
Sample Matrix:	Water	**Date Extracted:**	04/08/20

Lab Control Sample Summary
Phosphorus, Total

Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	676508

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002766-LCS	0.948	0.953	99	85-115

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/1/20
Sample Matrix:	Water	**Date Received:**	04/1/20
Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2002766-001	**51**	50	7	100	04/04/20 23:37	
AV-11	K2002766-002	**15.4**	0.50	0.07	1	04/05/20 00:05	
AV-10	K2002766-003	**94**	50	7	100	04/05/20 01:02	
99-EA3A	K2002766-004	**10.8**	0.50	0.07	1	04/05/20 01:30	
Method Blank	K2002766-MB	**0.10 J**	0.50	0.07	1	04/04/20 22:53	

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QA/QC Report

ent:	AECOM/URS Corporation	**Service Request:**	K2002766
Project	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
AV-09	K2002766-001DUP	50	7	51	50 J	50.5	4	20	04/04/20
AV-11	K2002766-002DUP	0.50	0.07	15.4	15.3	15.4	<1	20	04/05/20
AV-10	K2002766-003DUP	50	7	94	98	95.8	4	20	04/05/20
99-EA3A	K2002766-004DUP	0.50	0.07	10.8	10.8	10.8	<1	20	04/05/20

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ults flagged with a pound (#) indicate the control criteria is not applicable.

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ALS Group USA, Corp.
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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
		Date Analyzed:	04/5/20
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	AV-11	**Units:**	mg/L
Lab Code:	K2002766-002	**Basis:**	NA
Analysis Method:	415.1		
Prep Method:	None		

Matrix Spike
K2002766-002MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	15.4	129	100	113	83-117

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Analyzed:**	04/04/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	675808

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002766-LCS	23.7	25.0	95	83-117

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/1/20
Sample Matrix:	Water	**Date Received:**	04/1/20
Analysis Method:	ApplEnvMic12-90-3895-3896	**Units:**	MPN/100mL
Prep Method:	None	**Basis:**	NA

Hydrocarbon Degrading Bacteria

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2002766-001	ND U	900	-	1	04/01/20 15:00	
AV-11	K2002766-002	ND U	900	-	1	04/01/20 15:00	
AV-10	K2002766-003	ND U	900	-	1	04/01/20 15:00	
99-EA3A	K2002766-004	ND U	900	-	1	04/01/20 15:00	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/1/20
Sample Matrix:	Water	**Date Received:**	04/1/20
Analysis Method:	SM 9215 B	**Units:**	CFU/mL
Prep Method:	None	**Basis:**	NA

Heterotrophic Plate Count

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2002766-001	**46.5**	0.50	-	1	04/01/20 16:04	
AV-11	K2002766-002	**11.0**	0.50	-	1	04/01/20 16:04	
AV-10	K2002766-003	ND U	0.50	-	1	04/01/20 16:04	
99-EA3A	K2002766-004	**4.00**	0.50	-	1	04/01/20 16:04	

ALS Environmental

Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: AECOM/URS Corporation
Project: IP Longview/60608686

Service Request: K2002766

Cover Page - Organic Analysis Data Package
Diesel and Residual Range Organics

Sample Name	Lab Code	Date Collected	Date Received
AV-09	K2002766-001	04/01/2020	04/01/2020
AV-11	K2002766-002	04/01/2020	04/01/2020
AV-10	K2002766-003	04/01/2020	04/01/2020
99-EA3A	K2002766-004	04/01/2020	04/01/2020
99-EA3A	KWG2000958-1	04/01/2020	04/01/2020

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
Sample Matrix:	Water	**Date Received:**	04/01/2020

Diesel and Residual Range Organics

Sample Name:	AV-09	**Units:**	ug/L
Lab Code:	K2002766-001	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**320**	Y	290	13	1	04/02/20	04/06/20	KWG2000958	
Residual Range Organics (RRO)	**230**	J	570	22	1	04/02/20	04/06/20	KWG2000958	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	74	50-150	04/06/20	Acceptable
n-Triacontane	74	50-150	04/06/20	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
Sample Matrix:	Water	**Date Received:**	04/01/2020

Diesel and Residual Range Organics

Sample Name:	AV-11	**Units:**	ug/L
Lab Code:	K2002766-002	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**45**	J	290	13	1	04/02/20	04/06/20	KWG2000958	
Residual Range Organics (RRO)	**83**	J	570	22	1	04/02/20	04/06/20	KWG2000958	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	73	50-150	04/06/20	Acceptable
n-Triacontane	70	50-150	04/06/20	Acceptable

Comments:

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
Sample Matrix:	Water	**Date Received:**	04/01/2020

Diesel and Residual Range Organics

Sample Name:	AV-10	**Units:**	ug/L
Lab Code:	K2002766-003	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**6400**	Y	290	13	1	04/02/20	04/06/20	KWG2000958	
Residual Range Organics (RRO)	**3900**	L	570	22	1	04/02/20	04/06/20	KWG2000958	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	84	50-150	04/06/20	Acceptable
n-Triacontane	79	50-150	04/06/20	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
nple Matrix:	Water	**Date Received:**	04/01/2020

Diesel and Residual Range Organics

Sample Name:	99-EA3A	**Units:**	ug/L
Lab Code:	K2002766-004	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**190**	J	290	13	1	04/02/20	04/06/20	KWG2000958	
Residual Range Organics (RRO)	**120**	J	570	22	1	04/02/20	04/06/20	KWG2000958	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	78	50-150	04/06/20	Acceptable
n-Triacontane	77	50-150	04/06/20	Acceptable

nments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Diesel and Residual Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG2000958-4	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**13**	J	250	11	1	04/02/20	04/06/20	KWG2000958	
Residual Range Organics (RRO)	**30**	J	500	19	1	04/02/20	04/06/20	KWG2000958	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	81	50-150	04/06/20	Acceptable
n-Triacontane	79	50-150	04/06/20	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

QA/QC Report

Client: AECOM/URS Corporation **Service Request:** K2002766
Project: IP Longview/60608686
Sample Matrix: Water

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3510C **Units:** Percent
Analysis Method: NWTPH-Dx **Level:** Low

Sample Name	Lab Code	Sur1	Sur2
AV-09	K2002766-001	74	74
AV-11	K2002766-002	73	70
AV-10	K2002766-003	84	79
99-EA3A	K2002766-004	78	77
99-EA3ADUP	KWG2000958-1	81	80
Method Blank	KWG2000958-4	81	79
Lab Control Sample	KWG2000958-3	80	75

Surrogate Recovery Control Limits (%)

Sur1 =	o-Terphenyl	50-150
Sur2 =	n-Triacontane	50-150

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Extracted:**	04/02/2020
Sample Matrix:	Water	**Date Analyzed:**	04/06/2020

Duplicate Sample Summary
Diesel and Residual Range Organics

Sample Name:	99-EA3A	**Units:**	ug/L
Lab Code:	K2002766-004	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx	**Extraction Lot:**	KWG2000958

Analyte Name	MRL	MDL	Sample Result	99-EA3ADUP KWG2000958-1 Duplicate Sample Result	Average	Relative Percent Difference	RPD Limit
Diesel Range Organics (DRO)	290	13	190	200	190	5 #	30
Residual Range Organics (RRO)	570	22	120	120	120	1 #	30

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Extracted:**	04/02/2020
Sample Matrix:	Water	**Date Analyzed:**	04/06/2020

Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method:	EPA 3510C	**Units:**	ug/L
Analysis Method:	NWTPH-Dx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG2000958

Lab Control Sample
KWG2000958-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Diesel Range Organics (DRO)	2450	3200	76	46-140
Residual Range Organics (RRO)	1350	1600	84	45-159

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ALS Environmental

Chlorinated Phenolics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 10:10
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	AV-09	**Units:**	ug/L
Lab Code:	K2002766-001	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.50	0.071	1	04/06/20 12:19	4/2/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	95	55 - 130	04/06/20 12:19	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 10:52
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	AV-11	**Units:**	ug/L
Lab Code:	K2002766-002	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.50	0.071	1	04/06/20 12:37	4/2/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	93	55 - 130	04/06/20 12:37	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 12:10
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	AV-10	**Units:**	ug/L
Lab Code:	K2002766-003	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.50	0.071	1	04/06/20 12:55	4/2/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	72	55 - 130	04/06/20 12:55	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 12:24
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	99-EA3A	**Units:**	ug/L
Lab Code:	K2002766-004	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.50	0.071	1	04/06/20 13:13	4/2/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	103	55 - 130	04/06/20 13:13	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2004561-04	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.50	0.071	1	04/06/20 11:43	4/2/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	97	55 - 130	04/06/20 11:43	

Client: AECOM/URS Corporation **Service Request:** K2002766
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Chlorinated Phenolics

Analysis Method: 8151A Modified
Extraction Method: Method

Sample Name	Lab Code	4-Bromo-2,6-dichlorophenol 55-130
AV-09	K2002766-001	95
AV-11	K2002766-002	93
AV-10	K2002766-003	72
99-EA3A	K2002766-004	103
Method Blank	KQ2004561-04	97
Lab Control Sample	KQ2004561-03	94
99-EA3A	KQ2004561-01	98
99-EA3A	KQ2004561-02	106

ient:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20
Sample Matrix:	Water	**Date Received:**	04/01/20
		Date Analyzed:	04/6/20
		Date Extracted:	04/2/20

Duplicate Matrix Spike Summary
Chlorinated Phenolics

Sample Name:	99-EA3A	**Units:**	ug/L
Lab Code:	K2002766-004	**Basis:**	NA
Analysis Method:	8151A Modified		
Prep Method:	Method		

		Matrix Spike KQ2004561-01			Duplicate Matrix Spike KQ2004561-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol (PCP)	ND U	15.0	20.0	75	16.0	20.0	80	22-136	7	30

Results flagged with an asterisk (*) indicate values outside control criteria.

ults flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Analyzed:**	04/06/20
Sample Matrix:	Water	**Date Extracted:**	04/02/20

Lab Control Sample Summary
Chlorinated Phenolics

Analysis Method:	8151A Modified	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	675714

Lab Control Sample
KQ2004561-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Pentachlorophenol (PCP)	14.4	20.0	72	42-110

ALS Environmental

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
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ALS Group USA, Corp.
dba ALS Environmental

Prep Summary Report

Client: AECOM/URS Corporation
Project: IP Longview/60608686
Sample Matrix: Water

Service Request:K2002766

Chlorinated Phenolics

Prep Method: Method
Analytical Method: 8151A Modified

Extraction Lot: 356306
Extraction Date: 04/02/20 13:56

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
AV-09	K2002766-001	4/1/20	4/1/20	5 mL	1 mL	
AV-11	K2002766-002	4/1/20	4/1/20	5 mL	1 mL	
AV-10	K2002766-003	4/1/20	4/1/20	5 mL	1 mL	
99-EA3A	K2002766-004	4/1/20	4/1/20	5 mL	1 mL	
Matrix Spike	KQ2004561-01MS	4/1/20	4/1/20	5 mL	1 mL	
Duplicate Matrix Spike	KQ2004561-02DMS	4/1/20	4/1/20	5 mL	1 mL	
Lab Control Sample	KQ2004561-03LCS	NA	NA	5 mL	1 mL	
Method Blank	KQ2004561-04MB	NA	NA	5 mL	1 mL	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 10:10
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	AV-09	**Units:**	ng/L
Lab Code:	K2002766-001	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**9.8**	X	3.5	0.41	1	04/10/20 09:59	4/3/20	*
Acenaphthene	**1600**		3.5	0.37	1	04/10/20 09:59	4/3/20	
Acenaphthylene	**31**		3.5	0.38	1	04/10/20 09:59	4/3/20	
Anthracene	**310**		3.5	0.30	1	04/10/20 09:59	4/3/20	
Benz(a)anthracene	**17**		3.5	0.35	1	04/10/20 09:59	4/3/20	
Benzo(a)pyrene	**22**		3.5	0.42	1	04/10/20 09:59	4/3/20	
Benzo(b)fluoranthene	**29**		3.5	0.26	1	04/10/20 09:59	4/3/20	
Benzo(g,h,i)perylene	**20**		3.5	0.37	1	04/10/20 09:59	4/3/20	
Benzo(k)fluoranthene	**9.6**		3.5	0.42	1	04/10/20 09:59	4/3/20	
Chrysene	**16**		3.5	0.67	1	04/10/20 09:59	4/3/20	
Dibenz(a,h)anthracene	**5.1**		3.5	0.46	1	04/10/20 09:59	4/3/20	
Dibenzofuran	**16**		3.5	0.43	1	04/10/20 09:59	4/3/20	
Fluoranthene	**23**		3.5	0.47	1	04/10/20 09:59	4/3/20	
Fluorene	**62**	X	3.5	0.43	1	04/10/20 09:59	4/3/20	
leno(1,2,3-cd)pyrene	**21**		3.5	0.45	1	04/10/20 09:59	4/3/20	*
Naphthalene	**53**		3.5	0.73	1	04/10/20 09:59	4/3/20	
Phenanthrene	**23**		3.5	0.74	1	04/10/20 09:59	4/3/20	
Pyrene	**24**		3.5	0.80	1	04/10/20 09:59	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	84	39 - 123	04/10/20 09:59	
Fluorene-d10	84	28 - 125	04/10/20 09:59	
Terphenyl-d14	76	22 - 127	04/10/20 09:59	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 10:52
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	AV-11	**Units:**	ng/L
Lab Code:	K2002766-002	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**2.0 J**	3.5	0.41	1	04/10/20 10:39	4/3/20	*
Acenaphthene	**1.5 J**	3.5	0.37	1	04/10/20 10:39	4/3/20	
Acenaphthylene	ND U	3.5	0.38	1	04/10/20 10:39	4/3/20	
Anthracene	**6.0**	3.5	0.30	1	04/10/20 10:39	4/3/20	
Benz(a)anthracene	ND U	3.5	0.35	1	04/10/20 10:39	4/3/20	
Benzo(a)pyrene	ND U	3.5	0.42	1	04/10/20 10:39	4/3/20	
Benzo(b)fluoranthene	ND U	3.5	0.26	1	04/10/20 10:39	4/3/20	
Benzo(g,h,i)perylene	ND U	3.5	0.37	1	04/10/20 10:39	4/3/20	
Benzo(k)fluoranthene	ND U	3.5	0.42	1	04/10/20 10:39	4/3/20	
Chrysene	ND U	3.5	0.67	1	04/10/20 10:39	4/3/20	
Dibenz(a,h)anthracene	ND U	3.5	0.46	1	04/10/20 10:39	4/3/20	
Dibenzofuran	**0.88 J**	3.5	0.43	1	04/10/20 10:39	4/3/20	
Fluoranthene	**2.2 J**	3.5	0.47	1	04/10/20 10:39	4/3/20	
Fluorene	**2.0 J**	3.5	0.43	1	04/10/20 10:39	4/3/20	
Indeno(1,2,3-cd)pyrene	ND U	3.5	0.45	1	04/10/20 10:39	4/3/20	*
Naphthalene	**1.6 J**	3.5	0.73	1	04/10/20 10:39	4/3/20	
Phenanthrene	**3.0 J**	3.5	0.74	1	04/10/20 10:39	4/3/20	
Pyrene	**1.7 J**	3.5	0.80	1	04/10/20 10:39	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	81	39 - 123	04/10/20 10:39	
Fluorene-d10	82	28 - 125	04/10/20 10:39	
Terphenyl-d14	75	22 - 127	04/10/20 10:39	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 12:10
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	AV-10	**Units:**	ng/L
Lab Code:	K2002766-003	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**4600**	17	2.0	5	04/10/20 11:18	4/3/20	*
Acenaphthene	**70000**	340	36	100	04/10/20 17:16	4/3/20	
Acenaphthylene	**1700**	17	1.9	5	04/10/20 11:18	4/3/20	
Anthracene	**8700**	17	1.5	5	04/10/20 11:18	4/3/20	
Benz(a)anthracene	**240**	17	1.7	5	04/10/20 11:18	4/3/20	
Benzo(a)pyrene	**73**	17	2.1	5	04/10/20 11:18	4/3/20	
Benzo(b)fluoranthene	**110**	17	1.3	5	04/10/20 11:18	4/3/20	
Benzo(g,h,i)perylene	**39**	17	1.8	5	04/10/20 11:18	4/3/20	
Benzo(k)fluoranthene	**29**	17	2.1	5	04/10/20 11:18	4/3/20	
Chrysene	**270**	17	3.3	5	04/10/20 11:18	4/3/20	
Dibenz(a,h)anthracene	ND U	17	2.3	5	04/10/20 11:18	4/3/20	
Dibenzofuran	**34000**	340	42	100	04/10/20 17:16	4/3/20	
Fluoranthene	**4500**	17	2.3	5	04/10/20 11:18	4/3/20	
Fluorene	**30000**	340	42	100	04/10/20 17:16	4/3/20	
leno(1,2,3-cd)pyrene	**50**	17	2.2	5	04/10/20 11:18	4/3/20	*
Naphthalene	**48000**	340	71	100	04/10/20 17:16	4/3/20	
Phenanthrene	**21000**	340	72	100	04/10/20 17:16	4/3/20	
Pyrene	**2400**	17	3.9	5	04/10/20 11:18	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	70	39 - 123	04/10/20 11:18	
Fluorene-d10	77	28 - 125	04/10/20 11:18	
Terphenyl-d14	53	22 - 127	04/10/20 11:18	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 12:24
Sample Matrix:	Water	**Date Received:**	04/01/20 13:46
Sample Name:	99-EA3A	**Units:**	ng/L
Lab Code:	K2002766-004	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**7.4** X	3.4	0.40	1	04/10/20 11:58	4/3/20	*
Acenaphthene	**2700**	17	1.8	5	04/10/20 16:36	4/3/20	
Acenaphthylene	**26**	3.4	0.37	1	04/10/20 11:58	4/3/20	
Anthracene	**44**	3.4	0.29	1	04/10/20 11:58	4/3/20	
Benz(a)anthracene	**3.8**	3.4	0.34	1	04/10/20 11:58	4/3/20	
Benzo(a)pyrene	**3.8**	3.4	0.41	1	04/10/20 11:58	4/3/20	
Benzo(b)fluoranthene	**6.1**	3.4	0.25	1	04/10/20 11:58	4/3/20	
Benzo(g,h,i)perylene	**3.4** J	3.4	0.36	1	04/10/20 11:58	4/3/20	
Benzo(k)fluoranthene	**1.7** J	3.4	0.41	1	04/10/20 11:58	4/3/20	
Chrysene	**3.8**	3.4	0.65	1	04/10/20 11:58	4/3/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	04/10/20 11:58	4/3/20	
Dibenzofuran	**3.7**	3.4	0.42	1	04/10/20 11:58	4/3/20	
Fluoranthene	**8.5**	3.4	0.46	1	04/10/20 11:58	4/3/20	
Fluorene	**16** X	3.4	0.42	1	04/10/20 11:58	4/3/20	
Indeno(1,2,3-cd)pyrene	**3.4** J	3.4	0.44	1	04/10/20 11:58	4/3/20	*
Naphthalene	**20** X	3.4	0.71	1	04/10/20 11:58	4/3/20	
Phenanthrene	**6.9**	3.4	0.72	1	04/10/20 11:58	4/3/20	
Pyrene	**5.7**	3.4	0.78	1	04/10/20 11:58	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	67	39 - 123	04/10/20 11:58	
Fluorene-d10	72	28 - 125	04/10/20 11:58	
Terphenyl-d14	63	22 - 127	04/10/20 11:58	

Client:	AECOM/URS Corporation	**Service Request:**	K2002766
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ2004632-03	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	ND U	3.4	0.40	1	04/10/20 08:00	4/3/20	
Acenaphthene	ND U	3.4	0.36	1	04/10/20 08:00	4/3/20	
Acenaphthylene	ND U	3.4	0.37	1	04/10/20 08:00	4/3/20	
Anthracene	ND U	3.4	0.29	1	04/10/20 08:00	4/3/20	
Benz(a)anthracene	**0.50 J**	3.4	0.34	1	04/10/20 08:00	4/3/20	
Benzo(a)pyrene	ND U	3.4	0.41	1	04/10/20 08:00	4/3/20	
Benzo(b)fluoranthene	ND U	3.4	0.25	1	04/10/20 08:00	4/3/20	
Benzo(g,h,i)perylene	ND U	3.4	0.36	1	04/10/20 08:00	4/3/20	
Benzo(k)fluoranthene	ND U	3.4	0.41	1	04/10/20 08:00	4/3/20	
Chrysene	ND U	3.4	0.65	1	04/10/20 08:00	4/3/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	04/10/20 08:00	4/3/20	
Dibenzofuran	ND U	3.4	0.42	1	04/10/20 08:00	4/3/20	
Fluoranthene	ND U	3.4	0.46	1	04/10/20 08:00	4/3/20	
Fluorene	ND U	3.4	0.42	1	04/10/20 08:00	4/3/20	
Indeno(1,2,3-cd)pyrene	ND U	3.4	0.44	1	04/10/20 08:00	4/3/20	
Naphthalene	ND U	3.4	0.71	1	04/10/20 08:00	4/3/20	
Phenanthrene	**0.77 J**	3.4	0.72	1	04/10/20 08:00	4/3/20	
Pyrene	ND U	3.4	0.78	1	04/10/20 08:00	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	88	39 - 123	04/10/20 08:00	
Fluorene-d10	92	28 - 125	04/10/20 08:00	
Terphenyl-d14	82	22 - 127	04/10/20 08:00	

Client: AECOM/URS Corporation **Service Request:** K2002766
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	Fluoranthene-d10 39-123	Fluorene-d10 28-125	Terphenyl-d14 22-127
AV-09	K2002766-001	84	84	76
AV-11	K2002766-002	81	82	75
AV-10	K2002766-003	70	77	53
99-EA3A	K2002766-004	67	72	63
Method Blank	KQ2004632-03	88	92	82
Lab Control Sample	KQ2004632-01	83	84	79
Duplicate Lab Control Sample	KQ2004632-02	79	81	73

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April 23, 2020

Analytical Report for Service Request No: K2002824

Paul Kalina
AECOM
1111 Third Avenue, Suite 1400
Seattle, WA 98101

RE: IP Longview / 60608686

Dear Paul,

Enclosed are the results of the sample(s) submitted to our laboratory April 02, 2020
For your reference, these analyses have been assigned our service request number **K2002824.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental

Case Narrative

ALS Environmental—Kelso Laboratory
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www.alsglobal.com

ALS Environmental

Client: AECOM/URS Corporation
Project: IP Longview
Sample Matrix: Water

Service Request: K2002824
Date Received: 04/02/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Six water samples were received for analysis at ALS Environmental on 04/02/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Method 8270D, Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level 04/10/2020: The following analytes were flagged as outside the control criterion for Continuing Calibration Verification (CCV) MS20\0410F003.D: 2-Methylnaphthalene and Indeno(1,2,3-cd)pyrene. In accordance with the EPA Method, 80% or more of the CCV analytes must have passed within 20% of the true value. The remaining analytes are allowed a 40% difference as per the ALS SOP. The CCV met these criteria. No further corrective action was required.

Method 8270D, Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level 04/10/2020: The results reported for 2-Methylnaphthalene, Dibenzofuran, and Naphthalene in sample 97-6B may contain a slight bias. The chromatogram indicated the presence of non-target background components. The matrix interference may have resulted in a slight high bias in the affected sample. The results were flagged with "X" to indicate the issue.

Semivoa GC:

No significant anomalies were noted with this analysis.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Oan Date 04/23/2020

ALS Environmental

Chain of Custody

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ALS Environmental

CHAIN CUSTODY 102305

001

SR# K20-824

COC Set 1 of 1

COC#

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068
www.alsglobal.com

Project Name	IP Long View
Project Number	60608184
Project Manager	Paul Kalina
Company	AECOM
Address	1111 3rd Ave, Suite 1000 Seattle WA, 98101
Phone #	email Paul.Kalina@AECOM.com
Sampler Signature	
Sampler Printed Name	Bryan Darling

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	24H SM 9215 B / Het Plate	48H ApplEnvMic12-80-3895-3896 /	7D 8151A Modified / PCP	7D 8270D / PAH SIM ULL	14D NWTPH-Dx / NW_TPH	28D 300.0 / SO4	28D 353.2 / NO2 NO3 T	28D 365.3 / Phos T	28D 415.1 / TOC T	1 HDB	2	3	4	5	Remarks
1. 97-GB		4/1/20	1440	W	1				X	X										
2. 04-GA		4/1/20	1610	W	1				X	X										
3. 97-GC		4/1/20	1640	W	1				X	X										
4. AV-13		4/1/20	0815	W	10	X		X	X	X	X	X	X	X	X					
5. AV-12		4/1/20	0818	W	10	X		X	X	X	X	X	X	X	X					
6. AV-14		4/1/20	0940	W	10	X		X	X	X	X	X	X	X	X					
7.																				
8.																				
9.																				
10.																				

Report Requirements

___ I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. CLP Like Summary (no raw data)

___ IV. Data Validation Report

___ V. EDD

Invoice Information

P.O.#

Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard

Requested Report Date

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other____(Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name Bryan Darling	Printed Name TES	Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm 4/2/20 1437	Firm	Firm	Firm	Firm
Date/Time 4/1/2020 1435	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client AECOM Service Request K20 2824

Received: 4/2/20 Opened: 4/2/20 By: [signature] Unloaded: 4/2/20 By: [signature]

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____

   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample 1	Sample 2	Sample 3	Sample 4	IR GUN	Cooler / COC ID (NA)	Tracking Number (NA)	Filed
6.3	10.5	10.1	7.5	8.8	39800488WS	1 Liter Amber		
4.3	—	—	—	—	"	Everything else		

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N

   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: SHORT HOLD TIME

ALS Environmental

General Chemistry

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/2/20
Sample Matrix:	Water	**Date Received:**	04/2/20
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Sulfate

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-13	K2002824-004	**0.39 J**	0.40	0.04	2	04/03/20 14:27	
AV-12	K2002824-005	**2.93**	0.40	0.04	2	04/03/20 14:38	
AV-14	K2002824-006	**0.39 J**	0.40	0.04	2	04/03/20 14:48	
Method Blank	K2002824-MB	ND U	0.20	0.02	1	04/03/20 12:45	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project	IP Longview/60608686	**Date Collected:**	04/02/20
Sample Matrix:	Water	**Date Received:**	04/02/20
		Date Analyzed:	04/03/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	AV-13	**Units:**	mg/L
Lab Code:	K2002824-004	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2002824-004DUP Result	Average	RPD	RPD Limit
Sulfate	300.0	0.40	0.04	0.39 J	0.41	0.396	5	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20
Sample Matrix:	Water	**Date Received:**	04/02/20
		Date Analyzed:	04/3/20
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Sulfate

Sample Name:	AV-13	**Units:**	mg/L
Lab Code:	K2002824-004	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike K2002824-004MS			Duplicate Matrix Spike K2002824-004DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Sulfate	0.39 J	8.10	8.00	96	8.23	8.00	98	90-110	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Analyzed:**	04/03/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Sulfate

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	675761

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002824-LCS	5.05	5.00	101	90-110

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/2/20
Sample Matrix:	Water	**Date Received:**	04/2/20
Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-13	K2002824-004	**0.054**	0.050	0.020	1	04/06/20 14:26	4/6/20	
AV-12	K2002824-005	**0.059**	0.050	0.020	1	04/06/20 14:26	4/6/20	
AV-14	K2002824-006	**0.056**	0.050	0.020	1	04/06/20 14:26	4/6/20	
Method Blank	K2002824-MB	ND U	0.050	0.020	1	04/06/20 14:26	4/6/20	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Analyzed:**	04/06/20
Sample Matrix:	Water	**Date Extracted:**	04/06/20

Lab Control Sample Summary
Nitrate+Nitrite as Nitrogen

Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	676326

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002824-LCS	11.3	11.5	98	90-110

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/2/20
Sample Matrix:	Water	**Date Received:**	04/2/20
Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Phosphorus, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-13	K2002824-004	**1.64**	0.10	0.02	5	04/09/20 17:53	4/8/20	
AV-12	K2002824-005	**0.302**	0.020	0.004	1	04/09/20 17:53	4/8/20	
AV-14	K2002824-006	**1.57**	0.10	0.02	5	04/09/20 17:53	4/8/20	
Method Blank	K2002824-MB	ND U	0.020	0.004	1	04/09/20 17:53	4/8/20	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Analyzed:**	04/09/20
Sample Matrix:	Water	**Date Extracted:**	04/08/20

Lab Control Sample Summary
Phosphorus, Total

Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	676508

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002824-LCS	0.948	0.953	99	85-115

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/2/20
Sample Matrix:	Water	**Date Received:**	04/2/20
Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-13	K2002824-004	**59**	50	7	100	04/05/20 01:58	
AV-12	K2002824-005	**15.5**	0.50	0.07	1	04/05/20 02:56	
AV-14	K2002824-006	**58**	50	7	100	04/05/20 03:24	
Method Blank	K2002824-MB	**0.10 J**	0.50	0.07	1	04/04/20 22:53	

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QA/QC Report

ent:	AECOM/URS Corporation	**Service Request:**	K2002824
Project	IP Longview/60608686	**Date Collected:**	04/02/20
Sample Matrix:	Water	**Date Received:**	04/02/20
Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
AV-13	K2002824-004DUP	50	7	59	54	56.5	8	20	04/05/20
AV-12	K2002824-005DUP	0.50	0.07	15.5	15.5	15.5	<1	20	04/05/20
AV-14	K2002824-006DUP	50	7	58	51	54.4	13	20	04/05/20

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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Superset Reference:20-0000545293 rev 00

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Analyzed:**	04/04/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	675808

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2002824-LCS	23.7	25.0	95	83-117

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/2/20
Sample Matrix:	Water	**Date Received:**	04/2/20
Analysis Method:	ApplEnvMic12-90-3895-3896	**Units:**	MPN/100mL
Prep Method:	None	**Basis:**	NA

Hydrocarbon Degrading Bacteria

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-13	K2002824-004	ND U	900	-	1	04/02/20 16:05	
AV-12	K2002824-005	ND U	900	-	1	04/02/20 16:05	
AV-14	K2002824-006	ND U	900	-	1	04/02/20 16:05	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/2/20
Sample Matrix:	Water	**Date Received:**	04/2/20
Analysis Method:	SM 9215 B	**Units:**	CFU/mL
Prep Method:	None	**Basis:**	NA

Heterotrophic Plate Count

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-13	K2002824-004	ND U	0.50	-	1	04/02/20 16:22	
AV-12	K2002824-005	ND U	0.50	-	1	04/02/20 16:22	
AV-14	K2002824-006	ND U	0.50	-	1	04/02/20 16:22	

ALS Environmental

Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: AECOM/URS Corporation **Service Request:** K2002824
Project: IP Longview/60608686

Cover Page - Organic Analysis Data Package
Diesel and Residual Range Organics

Sample Name	Lab Code	Date Collected	Date Received
97-6B	K2002824-001	04/01/2020	04/02/2020
04-6A	K2002824-002	04/01/2020	04/02/2020
97-6C	K2002824-003	04/01/2020	04/02/2020
AV-13	K2002824-004	04/02/2020	04/02/2020
AV-12	K2002824-005	04/02/2020	04/02/2020
AV-14	K2002824-006	04/02/2020	04/02/2020

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
nple Matrix:	Water	**Date Received:**	04/02/2020

Diesel and Residual Range Organics

Sample Name:	97-6B	**Units:**	ug/L
Lab Code:	K2002824-001	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**250**	J	280	13	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**110**	J	560	22	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	74	50-150	04/08/20	Acceptable
n-Triacontane	71	50-150	04/08/20	Acceptable

ments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
Sample Matrix:	Water	**Date Received:**	04/02/2020

Diesel and Residual Range Organics

Sample Name:	04-6A	**Units:**	ug/L
Lab Code:	K2002824-002	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**2500**	Z	270	12	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**320**	J	540	21	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	73	50-150	04/08/20	Acceptable
n-Triacontane	69	50-150	04/08/20	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/01/2020
nple Matrix:	Water	**Date Received:**	04/02/2020

Diesel and Residual Range Organics

Sample Name:	97-6C	**Units:**	ug/L
Lab Code:	K2002824-003	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**2500**	Z	280	12	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**320**	J	550	21	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	78	50-150	04/08/20	Acceptable
n-Triacontane	74	50-150	04/08/20	Acceptable

ments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/2020
Sample Matrix:	Water	**Date Received:**	04/02/2020

Diesel and Residual Range Organics

Sample Name:	AV-13	**Units:**	ug/L
Lab Code:	K2002824-004	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**750**	Y	280	13	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**630**	L	560	22	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	56	50-150	04/08/20	Acceptable
n-Triacontane	53	50-150	04/08/20	Acceptable

Comments:

ALS Group USA, Corp. dba ALS Environmental

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/2020
Sample Matrix:	Water	**Date Received:**	04/02/2020

Diesel and Residual Range Organics

Sample Name:	AV-12	**Units:**	ug/L
Lab Code:	K2002824-005	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**98**	J	300	13	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**100**	J	590	23	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	69	50-150	04/08/20	Acceptable
n-Triacontane	66	50-150	04/08/20	Acceptable

ments:

Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/2020
Sample Matrix:	Water	**Date Received:**	04/02/2020

Diesel and Residual Range Organics

Sample Name:	AV-14	**Units:**	ug/L
Lab Code:	K2002824-006	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**990**	Y	280	13	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**860**	L	560	22	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	74	50-150	04/08/20	Acceptable
n-Triacontane	69	50-150	04/08/20	Acceptable

Comments:

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Analytical Results

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	NA
ple Matrix:	Water	**Date Received:**	NA

Diesel and Residual Range Organics

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG2001005-3	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	ND	U	250	11	1	04/07/20	04/08/20	KWG2001005	
Residual Range Organics (RRO)	**21**	J	500	19	1	04/07/20	04/08/20	KWG2001005	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	76	50-150	04/08/20	Acceptable
n-Triacontane	70	50-150	04/08/20	Acceptable

ments:

QA/QC Report

Client: AECOM/URS Corporation
Project: IP Longview/60608686
Sample Matrix: Water

Service Request: K2002824

Surrogate Recovery Summary
Diesel and Residual Range Organics

Extraction Method: EPA 3510C
Analysis Method: NWTPH-Dx

Units: Percent
Level: Low

Sample Name	Lab Code	Sur1	Sur2
97-6B	K2002824-001	74	71
04-6A	K2002824-002	73	69
97-6C	K2002824-003	78	74
AV-13	K2002824-004	56	53
AV-12	K2002824-005	69	66
AV-14	K2002824-006	74	69
Method Blank	KWG2001005-3	76	70
Lab Control Sample	KWG2001005-1	71	65
Duplicate Lab Control Sample	KWG2001005-2	71	65

Surrogate Recovery Control Limits (%)

Sur1	o-Terphenyl	50-150
Sur2	n-Triacontane	50-150

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Extracted:**	04/07/2020
nple Matrix:	Water	**Date Analyzed:**	04/08/2020

Lab Control Spike/Duplicate Lab Control Spike Summary
Diesel and Residual Range Organics

Extraction Method:	EPA 3510C	**Units:**	ug/L
Analysis Method:	NWTPH-Dx	**Basis:**	NA
		Level:	Low
		Extraction Lot:	KWG2001005

	Lab Control Sample KWG2001005-1 Lab Control Spike			Duplicate Lab Control Sample KWG2001005-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Spike Amount**	**%Rec**	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Diesel Range Organics (DRO)	2180	3200	68	2240	3200	70	46-140	3	30
Residual Range Organics (RRO)	1160	1600	73	1220	1600	76	45-159	4	30

lts flagged with an asterisk (*) indicate values outside control criteria.

ercent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Environmental

Chlorinated Phenolics

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Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20 08:15
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	AV-13	**Units:**	ug/L
Lab Code:	K2002824-004	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	04/07/20 15:25	4/6/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	79	55 - 130	04/07/20 15:25	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20 08:18
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	AV-12	**Units:**	ug/L
Lab Code:	K2002824-005	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	04/07/20 15:43	4/6/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	70	55 - 130	04/07/20 15:43	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20 08:40
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	AV-14	**Units:**	ug/L
Lab Code:	K2002824-006	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	04/07/20 16:01	4/6/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	83	55 - 130	04/07/20 16:01	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2004687-04	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	04/07/20 14:50	4/6/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	87	55 - 130	04/07/20 14:50	

Client: AECOM/URS Corporation **Service Request:** K2002824
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Chlorinated Phenolics

Analysis Method: 8151A Modified
Extraction Method: Method

Sample Name	Lab Code	4-Bromo-2,6-dichlorophenol 55-130
AV-13	K2002824-004	79
AV-12	K2002824-005	70
AV-14	K2002824-006	83
Method Blank	KQ2004687-04	87
Lab Control Sample	KQ2004687-03	105
AV-14	KQ2004687-01	87
AV-14	KQ2004687-02	93

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20
Sample Matrix:	Water	**Date Received:**	04/02/20
		Date Analyzed:	04/7/20
		Date Extracted:	04/6/20

Duplicate Matrix Spike Summary
Chlorinated Phenolics

Sample Name:	AV-14	**Units:**	ug/L
Lab Code:	K2002824-006	**Basis:**	NA
Analysis Method:	8151A Modified		
Prep Method:	Method		

		Matrix Spike KQ2004687-01			Duplicate Matrix Spike KQ2004687-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol (PCP)	ND U	7.14	10.0	71	7.39	10.0	74	22-136	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Analyzed:**	04/07/20
Sample Matrix:	Water	**Date Extracted:**	04/06/20

Lab Control Sample Summary
Chlorinated Phenolics

Analysis Method:	8151A Modified	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	676154

Lab Control Sample
KQ2004687-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Pentachlorophenol (PCP)	7.37	10.0	74	42-110

ALS Environmental

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

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dba ALS Environmental

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 14:40
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	97-6B	**Units:**	ng/L
Lab Code:	K2002824-001	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**3.7** X	3.5	0.41	1	04/10/20 12:38	4/3/20	*
Benz(a)anthracene	**15**	3.5	0.35	1	04/10/20 12:38	4/3/20	
Benzo(a)pyrene	**19**	3.5	0.42	1	04/10/20 12:38	4/3/20	
Benzo(b)fluoranthene	**24**	3.5	0.26	1	04/10/20 12:38	4/3/20	
Benzo(k)fluoranthene	**8.4**	3.5	0.42	1	04/10/20 12:38	4/3/20	
Chrysene	**15**	3.5	0.67	1	04/10/20 12:38	4/3/20	
Dibenz(a,h)anthracene	**4.3**	3.5	0.46	1	04/10/20 12:38	4/3/20	
Dibenzofuran	**3.5** X	3.5	0.43	1	04/10/20 12:38	4/3/20	
Indeno(1,2,3-cd)pyrene	**26**	3.5	0.45	1	04/10/20 12:38	4/3/20	*
Naphthalene	**17** X	3.5	0.73	1	04/10/20 12:38	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
oranthene-d10	72	39 - 123	04/10/20 12:38	
orene-d10	70	28 - 125	04/10/20 12:38	
Terphenyl-d14	67	22 - 127	04/10/20 12:38	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 16:10
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	04-6A	**Units:**	ng/L
Lab Code:	K2002824-002	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**85000**	340	40	100	04/10/20 17:55	4/3/20	*
Benz(a)anthracene	**1400**	68	6.8	20	04/10/20 14:37	4/3/20	
Benzo(a)pyrene	**500**	68	8.2	20	04/10/20 14:37	4/3/20	
Benzo(b)fluoranthene	**780**	68	5.0	20	04/10/20 14:37	4/3/20	
Benzo(k)fluoranthene	**340**	68	8.2	20	04/10/20 14:37	4/3/20	
Chrysene	**1600**	68	13	20	04/10/20 14:37	4/3/20	
Dibenz(a,h)anthracene	**63** J	68	9.0	20	04/10/20 14:37	4/3/20	
Dibenzofuran	**59000**	340	42	100	04/10/20 17:55	4/3/20	
Indeno(1,2,3-cd)pyrene	**220**	68	8.8	20	04/10/20 14:37	4/3/20	*
Naphthalene	**730000**	3400	710	1000	04/13/20 08:47	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	70	39 - 123	04/10/20 14:37	
Fluorene-d10	86	28 - 125	04/10/20 14:37	
Terphenyl-d14	73	22 - 127	04/10/20 14:37	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/01/20 16:40
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	97-6C	**Units:**	ng/L
Lab Code:	K2002824-003	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**89000**	340	40	100	04/10/20 18:35	4/3/20	*
Benz(a)anthracene	**1100**	68	6.8	20	04/10/20 15:16	4/3/20	
Benzo(a)pyrene	**410**	68	8.2	20	04/10/20 15:16	4/3/20	
Benzo(b)fluoranthene	**660**	68	5.0	20	04/10/20 15:16	4/3/20	
Benzo(k)fluoranthene	**290**	68	8.2	20	04/10/20 15:16	4/3/20	
Chrysene	**1200**	68	13	20	04/10/20 15:16	4/3/20	
Dibenz(a,h)anthracene	**55** J	68	9.0	20	04/10/20 15:16	4/3/20	
Dibenzofuran	**62000**	340	42	100	04/10/20 18:35	4/3/20	
Indeno(1,2,3-cd)pyrene	**180**	68	8.8	20	04/10/20 15:16	4/3/20	*
Naphthalene	**740000**	3400	710	1000	04/13/20 09:27	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
oranthene-d10	73	39 - 123	04/10/20 15:16	
orene-d10	90	28 - 125	04/10/20 15:16	
Terphenyl-d14	81	22 - 127	04/10/20 15:16	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20 08:15
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	AV-13	**Units:**	ng/L
Lab Code:	K2002824-004	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**93**	3.4	0.40	1	04/10/20 13:17	4/3/20	*
Acenaphthene	**3700**	6.8	0.72	2	04/13/20 07:28	4/3/20	
Acenaphthylene	**29**	3.4	0.37	1	04/10/20 13:17	4/3/20	
Anthracene	**150**	3.4	0.29	1	04/10/20 13:17	4/3/20	
Benz(a)anthracene	**30**	3.4	0.34	1	04/10/20 13:17	4/3/20	
Benzo(a)pyrene	**9.1**	3.4	0.41	1	04/10/20 13:17	4/3/20	
Benzo(b)fluoranthene	**17**	3.4	0.25	1	04/10/20 13:17	4/3/20	
Benzo(g,h,i)perylene	**3.0** J	3.4	0.36	1	04/10/20 13:17	4/3/20	
Benzo(k)fluoranthene	**5.4**	3.4	0.41	1	04/10/20 13:17	4/3/20	
Chrysene	**28**	3.4	0.65	1	04/10/20 13:17	4/3/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	04/10/20 13:17	4/3/20	
Dibenzofuran	**140**	3.4	0.42	1	04/10/20 13:17	4/3/20	
Fluoranthene	**210**	3.4	0.46	1	04/10/20 13:17	4/3/20	
Fluorene	**240**	3.4	0.42	1	04/10/20 13:17	4/3/20	
Indeno(1,2,3-cd)pyrene	**3.3** J	3.4	0.44	1	04/10/20 13:17	4/3/20	*
Naphthalene	**130**	3.4	0.71	1	04/10/20 13:17	4/3/20	
Phenanthrene	**490**	3.4	0.72	1	04/10/20 13:17	4/3/20	
Pyrene	**120**	3.4	0.78	1	04/10/20 13:17	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	77	39 - 123	04/10/20 13:17	
Fluorene-d10	87	28 - 125	04/10/20 13:17	
Terphenyl-d14	74	22 - 127	04/10/20 13:17	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20 08:18
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	AV-12	**Units:**	ng/L
Lab Code:	K2002824-005	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**59**	3.5	0.41	1	04/10/20 15:56	4/3/20	*
Acenaphthene	**67**	3.5	0.37	1	04/10/20 15:56	4/3/20	
Acenaphthylene	**6.2**	3.5	0.38	1	04/10/20 15:56	4/3/20	
Anthracene	**90**	3.5	0.30	1	04/10/20 15:56	4/3/20	
Benz(a)anthracene	**6.2**	3.5	0.35	1	04/10/20 15:56	4/3/20	
Benzo(a)pyrene	ND U	3.5	0.42	1	04/10/20 15:56	4/3/20	
Benzo(b)fluoranthene	**3.4 J**	3.5	0.26	1	04/10/20 15:56	4/3/20	
Benzo(g,h,i)perylene	ND U	3.5	0.37	1	04/10/20 15:56	4/3/20	
Benzo(k)fluoranthene	ND U	3.5	0.42	1	04/10/20 15:56	4/3/20	
Chrysene	**3.0 J**	3.5	0.67	1	04/10/20 15:56	4/3/20	
Dibenz(a,h)anthracene	ND U	3.5	0.46	1	04/10/20 15:56	4/3/20	
Dibenzofuran	**43**	3.5	0.43	1	04/10/20 15:56	4/3/20	
Fluoranthene	**27**	3.5	0.47	1	04/10/20 15:56	4/3/20	
[illegible]orene	**61**	3.5	0.43	1	04/10/20 15:56	4/3/20	
[illegible]eno(1,2,3-cd)pyrene	ND U	3.5	0.45	1	04/10/20 15:56	4/3/20	*
Naphthalene	**270**	3.5	0.73	1	04/10/20 15:56	4/3/20	
Phenanthrene	**71**	3.5	0.74	1	04/10/20 15:56	4/3/20	
Pyrene	**73**	3.5	0.80	1	04/10/20 15:56	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	76	39 - 123	04/10/20 15:56	
Fluorene-d10	85	28 - 125	04/10/20 15:56	
Terphenyl-d14	71	22 - 127	04/10/20 15:56	

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	04/02/20 08:40
Sample Matrix:	Water	**Date Received:**	04/02/20 14:37
Sample Name:	AV-14	**Units:**	ng/L
Lab Code:	K2002824-006	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**90**	3.4	0.40	1	04/10/20 13:57	4/3/20	*
Acenaphthene	**3400**	6.8	0.72	2	04/13/20 08:08	4/3/20	
Acenaphthylene	**26**	3.4	0.37	1	04/10/20 13:57	4/3/20	
Anthracene	**130**	3.4	0.29	1	04/10/20 13:57	4/3/20	
Benz(a)anthracene	**23**	3.4	0.34	1	04/10/20 13:57	4/3/20	
Benzo(a)pyrene	**6.7**	3.4	0.41	1	04/10/20 13:57	4/3/20	
Benzo(b)fluoranthene	**12**	3.4	0.25	1	04/10/20 13:57	4/3/20	
Benzo(g,h,i)perylene	**2.3** J	3.4	0.36	1	04/10/20 13:57	4/3/20	
Benzo(k)fluoranthene	**3.8**	3.4	0.41	1	04/10/20 13:57	4/3/20	
Chrysene	**20**	3.4	0.65	1	04/10/20 13:57	4/3/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	04/10/20 13:57	4/3/20	
Dibenzofuran	**130**	3.4	0.42	1	04/10/20 13:57	4/3/20	
Fluoranthene	**170**	3.4	0.46	1	04/10/20 13:57	4/3/20	
Fluorene	**210**	3.4	0.42	1	04/10/20 13:57	4/3/20	
Indeno(1,2,3-cd)pyrene	**3.6**	3.4	0.44	1	04/10/20 13:57	4/3/20	*
Naphthalene	**130**	3.4	0.71	1	04/10/20 13:57	4/3/20	
Phenanthrene	**410**	3.4	0.72	1	04/10/20 13:57	4/3/20	
Pyrene	**92**	3.4	0.78	1	04/10/20 13:57	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	70	39 - 123	04/10/20 13:57	
Fluorene-d10	77	28 - 125	04/10/20 13:57	
Terphenyl-d14	66	22 - 127	04/10/20 13:57	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ2004632-03	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	ND U	3.4	0.40	1	04/10/20 08:00	4/3/20	
Acenaphthene	ND U	3.4	0.36	1	04/10/20 08:00	4/3/20	
Acenaphthylene	ND U	3.4	0.37	1	04/10/20 08:00	4/3/20	
Anthracene	ND U	3.4	0.29	1	04/10/20 08:00	4/3/20	
Benz(a)anthracene	**0.50 J**	3.4	0.34	1	04/10/20 08:00	4/3/20	
Benzo(a)pyrene	ND U	3.4	0.41	1	04/10/20 08:00	4/3/20	
Benzo(b)fluoranthene	ND U	3.4	0.25	1	04/10/20 08:00	4/3/20	
Benzo(g,h,i)perylene	ND U	3.4	0.36	1	04/10/20 08:00	4/3/20	
Benzo(k)fluoranthene	ND U	3.4	0.41	1	04/10/20 08:00	4/3/20	
Chrysene	ND U	3.4	0.65	1	04/10/20 08:00	4/3/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	04/10/20 08:00	4/3/20	
Dibenzofuran	ND U	3.4	0.42	1	04/10/20 08:00	4/3/20	
Fluoranthene	ND U	3.4	0.46	1	04/10/20 08:00	4/3/20	
Fluorene	ND U	3.4	0.42	1	04/10/20 08:00	4/3/20	
Indeno(1,2,3-cd)pyrene	ND U	3.4	0.44	1	04/10/20 08:00	4/3/20	
Naphthalene	ND U	3.4	0.71	1	04/10/20 08:00	4/3/20	
Phenanthrene	**0.77 J**	3.4	0.72	1	04/10/20 08:00	4/3/20	
Pyrene	ND U	3.4	0.78	1	04/10/20 08:00	4/3/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	88	39 - 123	04/10/20 08:00	
Fluorene-d10	92	28 - 125	04/10/20 08:00	
Terphenyl-d14	82	22 - 127	04/10/20 08:00	

Client: AECOM/URS Corporation **Service Request:** K2002824
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	Fluoranthene-d10 39-123	Fluorene-d10 28-125	Terphenyl-d14 22-127
97-6B	K2002824-001	72	70	67
04-6A	K2002824-002	70	86	73
97-6C	K2002824-003	73	90	81
AV-13	K2002824-004	77	87	74
AV-12	K2002824-005	76	85	71
AV-14	K2002824-006	70	77	66
Method Blank	KQ2004632-03	88	92	82
Lab Control Sample	KQ2004632-01	83	84	79
Duplicate Lab Control Sample	KQ2004632-02	79	81	73

Client:	AECOM/URS Corporation	**Service Request:**	K2002824
Project:	IP Longview/60608686	**Date Analyzed:**	04/10/20
Sample Matrix:	Water	**Date Extracted:**	04/03/20

Duplicate Lab Control Sample Summary
Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method:	8270D	**Units:**	ng/L
Prep Method:	EPA 3520C	**Basis:**	NA
		Analysis Lot:	676527

	Lab Control Sample KQ2004632-01			Duplicate Lab Control Sample KQ2004632-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
2-Methylnaphthalene	467	500	93	453	500	91	42-108	3	30
Acenaphthene	398	500	80	398	500	80	58-98	<1	30
Acenaphthylene	395	500	79	389	500	78	61-102	2	30
Anthracene	387	500	77	379	500	76	65-98	2	30
Benz(a)anthracene	398	500	80	387	500	77	67-96	3	30
Benzo(a)pyrene	426	500	85	405	500	81	68-107	5	30
Benzo(b)fluoranthene	434	500	87	415	500	83	69-104	5	30
Benzo(g,h,i)perylene	448	500	90	421	500	84	61-110	6	30
Benzo(k)fluoranthene	419	500	84	403	500	81	68-108	4	30
Chrysene	382	500	76	368	500	74	67-105	4	30
Dibenz(a,h)anthracene	471	500	94	446	500	89	54-118	6	30
Dibenzofuran	401	500	80	391	500	78	52-103	3	30
Fluoranthene	383	500	77	373	500	75	63-106	3	30
Fluorene	402	500	80	392	500	78	59-97	3	30
Indeno(1,2,3-cd)pyrene	460	500	92	435	500	87	61-115	6	30
Naphthalene	377	500	75	360	500	72	59-95	5	30
Phenanthrene	356	500	71	347	500	69	61-100	3	30
Pyrene	374	500	75	360	500	72	64-104	4	30

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October 07, 2020

Analytical Report for Service Request No: K2007938

Paul Kalina
AECOM
1111 Third Avenue, Suite 1400
Seattle, WA 98101

RE: IP Longview / 60608686

Dear Paul,

Enclosed are the results of the sample(s) submitted to our laboratory September 14, 2020
For your reference, these analyses have been assigned our service request number **K2007938.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
)	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental

Case Narrative

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ALS Environmental

Client: AECOM/URS Corporation
Project: IP Longview
Sample Matrix: Water

Service Request: K2007938
Date Received: 09/14/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Seven water samples were received for analysis at ALS Environmental on 09/14/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Method 8270D\PAH SIM ULL, 09/24/2020: Samples AV-10, AV-06, AV-02, and AV-08 required dilution due to the presence of elevated levels of several target analytes. The reporting limits are adjusted to reflect the dilution.

Method 8270D\PAH SIM ULL, 09/23/2020: The results for 2-Methylnaphthalene and Phenanthrene in AV-08 may contain a slight bias. The chromatogram indicated the presence of non-target components. The matrix interference may have resulted in a slight high bias in the affected sample. The result was flagged with "X" to indicate the issue.
Method 8270D\PAH SIM ULL, 09/23/2020: The results for Acenaphthylene in AV-02 may contain a slight bias. The chromatogram indicated the presence of non-target components. The matrix interference may have resulted in a slight high bias in the affected sample. The result was flagged with "X" to indicate the issue.

Method 8270D\PAH SIM ULL, 09/24/2020: The detection limit was elevated for all analytes in sample AV-06 and AV-02. The sample extract was diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extract was highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. The reporting limits were adjusted to reflect the dilution.

The following analytes were flagged as outside the control criterion for Continuing Calibration Verification (CCV) MS20 \0923F030.D: 2-Methylnaphthalene. In accordance with the EPA Method, 80% or more of the CCV analytes must have passed within 20% of the true value. The remaining analytes are allowed a 40% difference as per the ALS SOP. The CCV met these criteria. No further corrective action was required.

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD) with this samples batch. A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Method 8270D\PAH SIM ULL, 09/23/2020: The detection limit was elevated for all analytes in sample AV-10 The sample extract was diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extract was highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. The reporting limits were adjusted to reflect the dilution.

Method 8270D\PAH SIM ULL, 09/23/2020: The results for one or more of the following analytes in AV-01 and AV-10 may contain a slight bias: Benzo(ghi)perylene, 2-Methylnaphthalene and Fluorene. The chromatogram indicated the presence of non-target components. The matrix interference may have resulted in a slight high bias in the affected sample. The result was flagged with "X" to indicate the issue.

Approved by Noe D. Oan Date 10/07/2020

ALS Environmental

Semivoa GC:

Method 8151A Modified, 09/16/2020: The analysis of Pentachlorophenol by EPA 8151M requires the use of dual column confirmation. When the Continuing Calibration Verification (CCV) criterion is met for both columns, the lower of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for 4-Bromo-2,6-dichlorophenol in several associated CCVs. The results were reported from the column with an acceptable CCV. The data quality was not affected. No further corrective action was necessary.
Method NWTPH-Dx, 09/17/2020: Samples AV-11, AV-06, AV-02 and AV-08 required dilution due to the presence of elevated levels of target analyte. The reporting limits are adjusted to reflect the dilution.
Method NWTPH-Dx, 09/17/2020: The control criteria for o-Terphenyl in sample AV-02 were not applicable. The chromatogram indicated the presence of target components that masked the surrogate, which prevented adequate resolution for quantitation. No corrective action was appropriate.

General Chemistry:

Method 353.2, 10/05/2020: The matrix spike recoveries of Nitrate+Nitrite as Nitrogen for sample AV-09 were outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outliers suggested a potential low bias in this matrix. No further corrective action was appropriate.

Approved by Mae D. Oan Date 10/07/2020

ALS Environmental

Chain of Custody

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K2007938

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Chain-of-Custody

Form 202r8

		SAMPLER	Edward LeCoy	DATE	9/14/2020
PROJECT NAME	IP Longview	SITE ID		TURNAROUND	
PROJECT No.	60608686	EDD FORMAT			
		PURCHASE ORDER			
COMPANY NAME	AECOM	BILL TO COMPANY			
SEND REPORT TO	Paul Kalina/Anthony Palmieri	INVOICE ATTN TO			
ADDRESS	1501 4th Avenue, Suite 1400	ADDRESS			
CITY / STATE / ZIP	Seattle Washington, 98101-3655	CITY / STATE / ZIP			
PHONE	Phone: +1 (206) 438 2700	PHONE			
FAX	Fax: +1 (206) 438 2699	FAX			
E-MAIL	paul.kalina@aecom.com	E-MAIL			

WORKORDER #	
PAGE	1 of 1
DISPOSAL	By Lab or Return to Client

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	PAH - ULL 8270C SIM ULL	PCP 8151	TPH (D/R)	SO4	NO3-NO2	TOC	Phosperous	HPC	HDB	Benzo(a)anthracene EPA 8270 Selected Ion Monitoring	Chrysene EPA 8270 Selected Ion Monitoring	Naphthalene EPA 8270 Selected Ion Monitoring	TPH-diesel NWTPH-Dx							
								8	8	1	8	3	3	3	7	7	8	8	8	1							
	AL-09	W	9/14	0955	12	Y	N	X	X	X	X	X	X	X	X	X												
	AL-11	W	9/14	1150	12	Y	N	X	X	X	X	X	X	X	X	X												
	AL-10	W	9/14	1335	12	Y	N	X	X	X	X	X	X	X	X	X												
	AL-01	W	9/14	1035	12	Y	N	X	X	X	X	X	X	X	X	X												
	AL-06	W	9/14	1308	12	Y	N	X	X	X	X	X	X	X	X	X												
	AL-02	W	9/14	1349	12	Y	N	X	X	X	X	X	X	X	X	X												
	AL-08	W	9/14	1510	12	Y	N	X	X	X	X	X	X	X	X	X												

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:	QC PACKAGE (check below)
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Edward LeCoy	9/14	1615
RECEIVED BY		Cody Carlson	9/14/20	1615
RELINQUISHED BY				
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

F2007938

PAH LIST A	PAH LIST B	PAH LIST C - Not Used in 2016
Naphthalene	Naphthalene	Naphthalene
Acenaphthylene		
Acenaphthene		
Fluorene		
Phenanthrene		
Anthracene		
Fluoranthene		
Pyrene		
Benzo(a)anthracene		Benzo(a)anthracene
Chrysene		Chrysene
Benzo(b)fluoranthene		
Benzo(k)fluoranthene	Benzo(k)fluoranthene	
Benzo(a)pyrene	Benzo(a)pyrene	
Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	
Dibenzo(a,h)anthracene	Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene		
2-Methylnaphthalene	2-Methylnaphthalene	
Dibenzofuran	Dibenzofuran	
Pentachlorophenol*		
(All AV-Wells, 99-EA3A)	*(04-6A, 97,6-B, 97-6C only)*	*(97-1A, 97-3A, 97-5A, LL-01 15 only)*

NOTES

* Pentachlorophenol by Method 8151. All Other PAHs by 8270C-SIM ULL

IP Longview 2016 Monitoring Events
rev 3/4/16

PM MH

Cooler Receipt and Preservation Form

Client Aecom Service Request K20 07938

Received: SEP 14 2020 Opened: SEP 14 2020 By: CG Unloaded: SEP 14 2020 By: CG

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA (Y) N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA (Y) N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID (NA)	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number (NA)	Filed
4.1	/	IR01		/	/		
3.3	/	IR01		/	/		
/	9.4	IR01		/	/		

6. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* (*Gel Packs*) (*Wet Ice*) *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
8. Were samples received in good condition (unbroken) NA (Y) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N
10. Did all sample labels and tags agree with custody papers? NA (Y) N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
13. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
14. Was C12/Res negative? NA (Y) N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: No temp blank in 1 of 3 coolers.

ALS Environmental

General Chemistry

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Sulfate

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2007938-001	**1.53**	0.40	0.04	2	10/06/20 10:24	
AV-11	K2007938-002	**0.20 J**	0.40	0.04	2	10/06/20 10:33	
AV-10	K2007938-003	**0.42**	0.40	0.04	2	10/06/20 10:42	
AV-01	K2007938-004	**12.9**	0.40	0.04	2	10/06/20 11:39	
AV-06	K2007938-005	**1.72**	0.40	0.04	2	10/06/20 11:49	
AV-02	K2007938-006	**1.04**	0.40	0.04	2	10/06/20 11:58	
AV-08	K2007938-007	**99.5**	4.0	0.4	20	10/06/20 13:51	
Method Blank	K2007938-MB1	ND U	0.20	0.02	1	10/06/20 09:00	
Method Blank	K2007938-MB2	ND U	0.20	0.02	1	10/06/20 13:42	
Method Blank	K2007938-MB3	ND U	0.20	0.02	1	10/06/20 16:59	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	10/06/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	AV-10	**Units:**	mg/L
Lab Code:	K2007938-003	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2007938-003DUP Result	Average	RPD	RPD Limit
Sulfate	300.0	0.40	0.04	0.42	0.39 J	0.407	8	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	10/6/20
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Sulfate

Sample Name:	AV-10	**Units:**	mg/L
Lab Code:	K2007938-003	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike K2007938-003MS			Duplicate Matrix Spike K2007938-003DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Sulfate	0.42	4.45	4.00	101	4.53	4.00	103	90-110	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

ent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	10/06/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Sulfate

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	698167

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007938-LCS1	5.10	5.00	102	90-110
Lab Control Sample	K2007938-LCS2	5.11	5.00	102	90-110
Lab Control Sample	K2007938-LCS3	5.13	5.00	103	90-110

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-09	K2007938-001	ND U	0.050	0.006	1	10/05/20 19:07	10/5/20	
AV-11	K2007938-002	ND U	0.050	0.006	1	10/05/20 19:07	10/5/20	
AV-10	K2007938-003	ND U	0.050	0.006	1	10/05/20 19:07	10/5/20	
AV-01	K2007938-004	ND U	0.050	0.006	1	10/05/20 19:07	10/5/20	
AV-06	K2007938-005	ND U	0.050	0.006	1	10/05/20 19:07	10/5/20	
AV-02	K2007938-006	**0.152**	0.050	0.006	1	10/05/20 19:07	10/5/20	
AV-08	K2007938-007	**0.032 J**	0.050	0.006	1	10/05/20 19:07	10/5/20	
Method Blank	K2007938-MB1	ND U	0.050	0.006	1	10/05/20 19:07	10/5/20	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	10/05/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	AV-09	**Units:**	mg/L
Lab Code:	K2007938-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2007938-001DUP Result	Average	RPD	RPD Limit
Nitrate+Nitrite as Nitrogen	353.2	0.050	0.006	ND U	ND U	NC	NC	20

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	10/5/20
		Date Extracted:	10/5/20

Duplicate Matrix Spike Summary
Nitrate+Nitrite as Nitrogen

Sample Name:	AV-09	**Units:**	mg/L
Lab Code:	K2007938-001	**Basis:**	NA
Analysis Method:	353.2		
Prep Method:	Method		

		Matrix Spike K2007938-001MS			Duplicate Matrix Spike K2007938-001DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Nitrate+Nitrite as Nitrogen	ND U	0.598	1.00	60 *	0.599	1.00	60 *	90-110	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Spike recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	10/05/20
Sample Matrix:	Water	**Date Extracted:**	10/05/20

Lab Control Sample Summary
Nitrate+Nitrite as Nitrogen

Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	698237

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007938-LCS1	17.4	16.1	108	90-110

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Phosphorus, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-09	K2007938-001	**2.01**	0.10	0.02	5	09/28/20 17:36	9/28/20	
AV-11	K2007938-002	**2.39**	0.10	0.02	5	09/28/20 17:36	9/28/20	
AV-10	K2007938-003	**0.80**	0.10	0.02	5	09/28/20 17:36	9/28/20	
AV-01	K2007938-004	**1.74**	0.10	0.02	5	09/28/20 17:36	9/28/20	
AV-06	K2007938-005	**1.10**	0.10	0.02	5	09/28/20 17:36	9/28/20	
AV-02	K2007938-006	**0.76**	0.10	0.02	5	09/28/20 17:36	9/28/20	
AV-08	K2007938-007	**0.42**	0.10	0.02	5	09/28/20 17:36	9/28/20	
Method Blank	K2007938-MB1	**0.006 J**	0.020	0.004	1	09/28/20 17:36	9/28/20	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	09/28/20
Sample Matrix:	Water	**Date Extracted:**	09/28/20

Lab Control Sample Summary
Phosphorus, Total

Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	696990

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007938-LCS1	2.71	2.75	99	85-115

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2007938-001	**33.0**	1.0	0.2	2	10/01/20 10:50	
AV-11	K2007938-002	**14.3**	1.0	0.2	2	10/01/20 10:50	
AV-10	K2007938-003	**71.4**	1.0	0.2	2	10/01/20 10:50	
AV-01	K2007938-004	**16.0**	1.0	0.2	2	10/01/20 10:50	
AV-06	K2007938-005	**56.0**	1.0	0.2	2	10/01/20 10:50	
AV-02	K2007938-006	**93.6**	1.0	0.2	2	10/01/20 10:50	
AV-08	K2007938-007	**35.5**	1.0	0.2	2	10/01/20 10:50	
Method Blank	K2007938-MB1	ND U	0.50	0.07	1	10/01/20 10:50	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	10/01/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	697883

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007938-LCS1	25.4	25.0	102	83-117

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
Analysis Method:	ApplEnvMic12-90-3895-3896	**Units:**	MPN/100mL
Prep Method:	None	**Basis:**	NA

Hydrocarbon Degrading Bacteria

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2007938-001	ND U	900	-	1	09/14/20 17:30	
AV-11	K2007938-002	ND U	900	-	1	09/14/20 17:30	
AV-10	K2007938-003	ND U	900	-	1	09/14/20 17:30	
AV-01	K2007938-004	ND U	900	-	1	09/14/20 17:30	
AV-06	K2007938-005	**55000**	900	-	1	09/14/20 17:30	
AV-02	K2007938-006	**900**	900	-	1	09/14/20 17:30	
AV-08	K2007938-007	ND U	900	-	1	09/14/20 17:30	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
Analysis Method:	SM 9215 B	**Units:**	CFU/mL
Prep Method:	None	**Basis:**	NA

Heterotrophic Plate Count

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-09	K2007938-001	**11.5**	0.50	-	1	09/14/20 18:00	
AV-11	K2007938-002	**6.00**	0.50	-	1	09/14/20 18:00	
AV-10	K2007938-003	ND U	0.50	-	1	09/14/20 18:00	
AV-01	K2007938-004	**11.5**	0.50	-	1	09/14/20 18:00	
AV-06	K2007938-005	**400**	5.0	-	10	09/14/20 18:00	
AV-02	K2007938-006	**1.50**	0.50	-	1	09/14/20 18:00	
AV-08	K2007938-007	**6.50**	0.50	-	1	09/14/20 18:00	

ALS Environmental

Diesel and Residual Range Organics

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Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 09:55
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-09	**Units:**	ug/L
Lab Code:	K2007938-001	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**160 J**	250	11	1	09/18/20 08:27	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**190 J**	500	19	1	09/18/20 08:27	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	72	50 - 150	09/18/20 08:27	
n-Triacontane	75	50 - 150	09/18/20 08:27	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 11:50
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-11	**Units:**	ug/L
Lab Code:	K2007938-002	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**65 J**	250	11	1	09/18/20 09:57	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**130 J**	500	19	1	09/18/20 09:57	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	73	50 - 150	09/18/20 09:57	
n-Triacontane	74	50 - 150	09/18/20 09:57	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:35
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-10	**Units:**	ug/L
Lab Code:	K2007938-003	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**4100 Y**	2500	110	10	09/17/20 20:28	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**3200 J**	5000	190	10	09/17/20 20:28	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	69	50 - 150	09/17/20 20:28	
n-Triacontane	65	50 - 150	09/17/20 20:28	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 10:35
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-01	**Units:**	ug/L
Lab Code:	K2007938-004	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**660 Y**	250	11	1	09/17/20 13:43	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**260 J**	500	19	1	09/17/20 13:43	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	77	50 - 150	09/17/20 13:43	
n-Triacontane	78	50 - 150	09/17/20 13:43	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:08
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-06	**Units:**	ug/L
Lab Code:	K2007938-005	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**5900 Y**	2500	110	10	09/17/20 14:06	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**1500 J**	5000	190	10	09/17/20 14:06	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	66	50 - 150	09/17/20 14:06	
n-Triacontane	54	50 - 150	09/17/20 14:06	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:49
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-02	**Units:**	ug/L
Lab Code:	K2007938-006	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**16000 Y**	2500	110	10	09/17/20 15:58	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**3700 J**	5000	190	10	09/17/20 15:58	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	157	50 - 150	09/17/20 15:58	*
n-Triacontane	84	50 - 150	09/17/20 15:58	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 15:16
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-08	**Units:**	ug/L
Lab Code:	K2007938-007	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**6000 Y**	2500	110	10	09/17/20 14:28	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**2300 J**	5000	190	10	09/17/20 14:28	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	93	50 - 150	09/17/20 14:28	
n-Triacontane	77	50 - 150	09/17/20 14:28	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2013137-04	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**24 J**	250	11	1	09/17/20 02:29	9/15/20	
Residual Range Organics (C25 - C36 RRO)	**66 J**	500	19	1	09/17/20 02:29	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	68	50 - 150	09/17/20 02:29	
n-Triacontane	71	50 - 150	09/17/20 02:29	

Client: AECOM/URS Corporation **Service Request:** K2007938
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Extraction Method: EPA 3510C

Sample Name	Lab Code	o-Terphenyl 50-150	n-Triacontane 50-150
AV-09	K2007938-001	72	75
AV-11	K2007938-002	73	74
AV-10	K2007938-003	69	65
AV-01	K2007938-004	77	78
AV-06	K2007938-005	66	54
AV-02	K2007938-006	157*	84
AV-08	K2007938-007	93	77
AV-09	KQ2013137-01	70	74
AV-11	KQ2013137-02	71	73
Method Blank	KQ2013137-04	68	71
Lab Control Sample	KQ2013137-03	67	69

ent:	AECOM/URS Corporation	**Service Request:**	K2007938
Project	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	09/18/20

Replicate Sample Summary
Semi-Volatile Petroleum Products by GC/FID

Sample Name: AV-09 **Units:** ug/L
Lab Code: K2007938-001 **Basis:** NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2013137-01 Result	Average	RPD	RPD Limit
Diesel Range Organics (C12 - C25 DRO)	NWTPH-Dx	250	11	160 J	160 J	165	<1	30
Residual Range Organics (C25 - C36 RRO)	NWTPH-Dx	500	19	190 J	210 J	203	12	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	09/18/20

Replicate Sample Summary

Semi-Volatile Petroleum Products by GC/FID

Sample Name:	AV-11	**Units:**	ug/L
Lab Code:	K2007938-002	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2013137-02 Result	Average	RPD	RPD Limit
Diesel Range Organics (C12 - C25 DRO)	NWTPH-Dx	250	11	65 J	59 J	61.9	10	30
Residual Range Organics (C25 - C36 RRO)	NWTPH-Dx	500	19	130 J	120 J	124	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	09/17/20
Sample Matrix:	Water	**Date Extracted:**	09/15/20

Lab Control Sample Summary
Semi-Volatile Petroleum Products by GC/FID

Analysis Method:	NWTPH-Dx	**Units:**	ug/L
Prep Method:	EPA 3510C	**Basis:**	NA
		Analysis Lot:	695615

Lab Control Sample
KQ2013137-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Diesel Range Organics (C12 - C25 DRO)	2290	3200	72	46-140
Residual Range Organics (C25 - C36 RRO)	1290	1600	81	45-159

ALS Environmental

Chlorinated Phenolics

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 09:55
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-09	**Units:**	ug/L
Lab Code:	K2007938-001	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/16/20 18:34	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	111	71 - 127	09/16/20 18:34	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 11:50
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-11	**Units:**	ug/L
Lab Code:	K2007938-002	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/16/20 18:52	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	104	71 - 127	09/16/20 18:52	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:35
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-10	**Units:**	ug/L
Lab Code:	K2007938-003	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/16/20 19:09	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	103	71 - 127	09/16/20 19:09	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 10:35
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-01	**Units:**	ug/L
Lab Code:	K2007938-004	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/16/20 19:26	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	107	71 - 127	09/16/20 19:26	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:08
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-06	**Units:**	ug/L
Lab Code:	K2007938-005	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	**0.11 JP**	0.25	0.071	1	09/16/20 19:43	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	92	71 - 127	09/16/20 19:43	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:49
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-02	**Units:**	ug/L
Lab Code:	K2007938-006	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	**0.20 J**	0.25	0.071	1	09/16/20 20:00	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	87	71 - 127	09/16/20 20:00	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 15:16
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-08	**Units:**	ug/L
Lab Code:	K2007938-007	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/16/20 20:17	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	99	71 - 127	09/16/20 20:17	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2013099-04	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/16/20 18:00	9/15/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	110	71 - 127	09/16/20 18:00	

Client: AECOM/URS Corporation **Service Request:** K2007938
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Chlorinated Phenolics

Analysis Method: 8151A Modified
Extraction Method: Method

Sample Name	Lab Code	4-Bromo-2,6-dichlorophenol 71-127
AV-09	K2007938-001	111
AV-11	K2007938-002	104
AV-10	K2007938-003	103
AV-01	K2007938-004	107
AV-06	K2007938-005	92
AV-02	K2007938-006	87
AV-08	K2007938-007	99
Method Blank	KQ2013099-04	110
Lab Control Sample	KQ2013099-03	105
AV-08	KQ2013099-01	107
AV-08	KQ2013099-02	103

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/14/20
		Date Analyzed:	09/16/20
		Date Extracted:	09/15/20

Duplicate Matrix Spike Summary
Chlorinated Phenolics

Sample Name:	AV-08	**Units:**	ug/L
Lab Code:	K2007938-007	**Basis:**	NA
Analysis Method:	8151A Modified		
Prep Method:	Method		

		Matrix Spike KQ2013099-01			Duplicate Matrix Spike KQ2013099-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol (PCP)	ND U	10.3	10.0	103	9.96	10.0	100	44-135	3	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	09/16/20
Sample Matrix:	Water	**Date Extracted:**	09/15/20

Lab Control Sample Summary
Chlorinated Phenolics

Analysis Method:	8151A Modified	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	695149

Lab Control Sample
KQ2013099-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Pentachlorophenol (PCP)	9.85	10.0	98	44-135

ALS Environmental

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

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Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 09:55
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-09	**Units:**	ng/L
Lab Code:	K2007938-001	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**2.2** J	3.4	0.40	1	09/23/20 18:43	9/17/20	
Acenaphthene	**22**	3.4	0.36	1	09/23/20 18:43	9/17/20	
Acenaphthylene	ND U	3.4	0.37	1	09/23/20 18:43	9/17/20	
Anthracene	**27**	3.4	0.29	1	09/23/20 18:43	9/17/20	
Benz(a)anthracene	**10**	3.4	0.34	1	09/23/20 18:43	9/17/20	
Benzo(a)pyrene	**12**	3.4	0.41	1	09/23/20 18:43	9/17/20	
Benzo(b)fluoranthene	**16**	3.4	0.25	1	09/23/20 18:43	9/17/20	
Benzo(g,h,i)perylene	**9.9**	3.4	0.36	1	09/23/20 18:43	9/17/20	
Benzo(k)fluoranthene	**5.8**	3.4	0.41	1	09/23/20 18:43	9/17/20	
Chrysene	**9.6**	3.4	0.65	1	09/23/20 18:43	9/17/20	
Dibenz(a,h)anthracene	**2.3** J	3.4	0.45	1	09/23/20 18:43	9/17/20	
Dibenzofuran	**2.8** J	3.4	0.42	1	09/23/20 18:43	9/17/20	
Fluoranthene	**13**	3.4	0.46	1	09/23/20 18:43	9/17/20	
Fluorene	**6.2**	3.4	0.42	1	09/23/20 18:43	9/17/20	
Indeno(1,2,3-cd)pyrene	**10**	3.4	0.44	1	09/23/20 18:43	9/17/20	
Naphthalene	**6.7**	3.4	0.71	1	09/23/20 18:43	9/17/20	
Phenanthrene	**9.2**	3.4	0.72	1	09/23/20 18:43	9/17/20	
Pyrene	**13**	3.4	0.78	1	09/23/20 18:43	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	81	39 - 123	09/23/20 18:43	
Fluorene-d10	73	28 - 125	09/23/20 18:43	
Terphenyl-d14	72	22 - 127	09/23/20 18:43	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 11:50
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-11	**Units:**	ng/L
Lab Code:	K2007938-002	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**1.3 J**	3.4	0.40	1	09/23/20 19:19	9/17/20	
Acenaphthene	**1.1 J**	3.4	0.36	1	09/23/20 19:19	9/17/20	
Acenaphthylene	ND U	3.4	0.37	1	09/23/20 19:19	9/17/20	
Anthracene	**3.2 J**	3.4	0.29	1	09/23/20 19:19	9/17/20	
Benz(a)anthracene	ND U	3.4	0.34	1	09/23/20 19:19	9/17/20	
Benzo(a)pyrene	ND U	3.4	0.41	1	09/23/20 19:19	9/17/20	
Benzo(b)fluoranthene	ND U	3.4	0.25	1	09/23/20 19:19	9/17/20	
Benzo(g,h,i)perylene	ND U	3.4	0.36	1	09/23/20 19:19	9/17/20	
Benzo(k)fluoranthene	ND U	3.4	0.41	1	09/23/20 19:19	9/17/20	
Chrysene	ND U	3.4	0.65	1	09/23/20 19:19	9/17/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	09/23/20 19:19	9/17/20	
Dibenzofuran	**0.96 J**	3.4	0.42	1	09/23/20 19:19	9/17/20	
Fluoranthene	**1.6 J**	3.4	0.46	1	09/23/20 19:19	9/17/20	
Fluorene	**1.1 J**	3.4	0.42	1	09/23/20 19:19	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	3.4	0.44	1	09/23/20 19:19	9/17/20	
Naphthalene	**2.6 J**	3.4	0.71	1	09/23/20 19:19	9/17/20	
Phenanthrene	**2.4 J**	3.4	0.72	1	09/23/20 19:19	9/17/20	
Pyrene	**1.8 J**	3.4	0.78	1	09/23/20 19:19	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	83	39 - 123	09/23/20 19:19	
Fluorene-d10	71	28 - 125	09/23/20 19:19	
Terphenyl-d14	77	22 - 127	09/23/20 19:19	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:35
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-10	**Units:**	ng/L
Lab Code:	K2007938-003	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**4300**		17	2.0	5	09/23/20 21:09	9/17/20	
Acenaphthene	**72000**		340	36	100	09/23/20 07:41	9/17/20	
Acenaphthylene	**1900**		17	1.9	5	09/23/20 21:09	9/17/20	
Anthracene	**8300**		17	1.5	5	09/23/20 21:09	9/17/20	
Benz(a)anthracene	**180**		17	1.7	5	09/23/20 21:09	9/17/20	
Benzo(a)pyrene	**46**		17	2.1	5	09/23/20 21:09	9/17/20	
Benzo(b)fluoranthene	**46**		17	1.3	5	09/23/20 21:09	9/17/20	
Benzo(g,h,i)perylene	**12**	**JX**	17	1.8	5	09/23/20 21:09	9/17/20	
Benzo(k)fluoranthene	**14**	**J**	17	2.1	5	09/23/20 21:09	9/17/20	
Chrysene	**170**		17	3.3	5	09/23/20 21:09	9/17/20	
Dibenz(a,h)anthracene	ND	U	17	2.3	5	09/23/20 21:09	9/17/20	
Dibenzofuran	**29000**		340	42	100	09/23/20 07:41	9/17/20	
Fluoranthene	**3500**		17	2.3	5	09/23/20 21:09	9/17/20	
Fluorene	**24000**		340	42	100	09/23/20 07:41	9/17/20	
Indeno(1,2,3-cd)pyrene	**26**		17	2.2	5	09/23/20 21:09	9/17/20	
Naphthalene	**4300**		17	3.6	5	09/23/20 21:09	9/17/20	
Phenanthrene	**15000**		340	72	100	09/23/20 07:41	9/17/20	
Pyrene	**2000**		17	3.9	5	09/23/20 21:09	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	77	39 - 123	09/23/20 21:09	
Fluorene-d10	67	28 - 125	09/23/20 21:09	
Terphenyl-d14	66	22 - 127	09/23/20 21:09	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 10:35
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-01	**Units:**	ng/L
Lab Code:	K2007938-004	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**4.2** X	3.4	0.40	1	09/23/20 19:56	9/17/20	
Acenaphthene	**870**	3.4	0.36	1	09/23/20 19:56	9/17/20	
Acenaphthylene	**11**	3.4	0.37	1	09/23/20 19:56	9/17/20	
Anthracene	**170**	3.4	0.29	1	09/23/20 19:56	9/17/20	
Benz(a)anthracene	ND U	3.4	0.34	1	09/23/20 19:56	9/17/20	
Benzo(a)pyrene	ND U	3.4	0.41	1	09/23/20 19:56	9/17/20	
Benzo(b)fluoranthene	ND U	3.4	0.25	1	09/23/20 19:56	9/17/20	
Benzo(g,h,i)perylene	ND U	3.4	0.36	1	09/23/20 19:56	9/17/20	
Benzo(k)fluoranthene	ND U	3.4	0.41	1	09/23/20 19:56	9/17/20	
Chrysene	ND U	3.4	0.65	1	09/23/20 19:56	9/17/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	09/23/20 19:56	9/17/20	
Dibenzofuran	ND U	3.4	0.42	1	09/23/20 19:56	9/17/20	
Fluoranthene	ND U	3.4	0.46	1	09/23/20 19:56	9/17/20	
Fluorene	**10** X	3.4	0.42	1	09/23/20 19:56	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	3.4	0.44	1	09/23/20 19:56	9/17/20	
Naphthalene	**16**	3.4	0.71	1	09/23/20 19:56	9/17/20	
Phenanthrene	**6.3**	3.4	0.72	1	09/23/20 19:56	9/17/20	
Pyrene	**55**	3.4	0.78	1	09/23/20 19:56	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	79	39 - 123	09/23/20 19:56	
Fluorene-d10	65	28 - 125	09/23/20 19:56	
Terphenyl-d14	73	22 - 127	09/23/20 19:56	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:08
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-06	**Units:**	ng/L
Lab Code:	K2007938-005	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**19000**	34	4.0	10	09/24/20 00:49	9/17/20	*
Acenaphthene	**25000**	680	72	200	09/23/20 08:17	9/17/20	
Acenaphthylene	**910**	34	3.7	10	09/24/20 00:49	9/17/20	
Anthracene	**3000**	34	2.9	10	09/24/20 00:49	9/17/20	
Benz(a)anthracene	**1200**	34	3.4	10	09/24/20 00:49	9/17/20	
Benzo(a)pyrene	**550**	34	4.1	10	09/24/20 00:49	9/17/20	
Benzo(b)fluoranthene	**880**	34	2.5	10	09/24/20 00:49	9/17/20	
Benzo(g,h,i)perylene	**140**	34	3.6	10	09/24/20 00:49	9/17/20	
Benzo(k)fluoranthene	**240**	34	4.1	10	09/24/20 00:49	9/17/20	
Chrysene	**950**	34	6.5	10	09/24/20 00:49	9/17/20	
Dibenz(a,h)anthracene	**43**	34	4.5	10	09/24/20 00:49	9/17/20	
Dibenzofuran	**10000**	34	4.2	10	09/24/20 00:49	9/17/20	
Fluoranthene	**6800**	34	4.6	10	09/24/20 00:49	9/17/20	
Fluorene	**11000**	34	4.2	10	09/24/20 00:49	9/17/20	
Indeno(1,2,3-cd)pyrene	**210**	34	4.4	10	09/24/20 00:49	9/17/20	
Naphthalene	**30000**	680	150	200	09/23/20 08:17	9/17/20	
Phenanthrene	**6600**	34	7.2	10	09/24/20 00:49	9/17/20	
Pyrene	**4600**	34	7.8	10	09/24/20 00:49	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	74	39 - 123	09/24/20 00:49	
Fluorene-d10	99	28 - 125	09/24/20 00:49	
Terphenyl-d14	30	22 - 127	09/24/20 00:49	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 13:49
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-02	**Units:**	ng/L
Lab Code:	K2007938-006	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**9100**	34	4.0	10	09/24/20 01:26	9/17/20	*
Acenaphthene	**38000**	340	36	100	09/23/20 08:54	9/17/20	
Acenaphthylene	**630** X	34	3.7	10	09/24/20 01:26	9/17/20	
Anthracene	**3800**	34	2.9	10	09/24/20 01:26	9/17/20	
Benz(a)anthracene	**270**	34	3.4	10	09/24/20 01:26	9/17/20	
Benzo(a)pyrene	**110**	34	4.1	10	09/24/20 01:26	9/17/20	
Benzo(b)fluoranthene	**140**	34	2.5	10	09/24/20 01:26	9/17/20	
Benzo(g,h,i)perylene	**34** J	34	3.6	10	09/24/20 01:26	9/17/20	
Benzo(k)fluoranthene	**29** J	34	4.1	10	09/24/20 01:26	9/17/20	
Chrysene	**130**	34	6.5	10	09/24/20 01:26	9/17/20	
Dibenz(a,h)anthracene	**11** J	34	4.5	10	09/24/20 01:26	9/17/20	
Dibenzofuran	**17000**	34	4.2	10	09/24/20 01:26	9/17/20	
Fluoranthene	**4900**	34	4.6	10	09/24/20 01:26	9/17/20	
Fluorene	**16000**	34	4.2	10	09/24/20 01:26	9/17/20	
Indeno(1,2,3-cd)pyrene	**49**	34	4.4	10	09/24/20 01:26	9/17/20	
Naphthalene	**100000**	340	71	100	09/23/20 08:54	9/17/20	
Phenanthrene	**480**	34	7.2	10	09/24/20 01:26	9/17/20	
Pyrene	**2400**	34	7.8	10	09/24/20 01:26	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	86	39 - 123	09/24/20 01:26	
Fluorene-d10	79	28 - 125	09/24/20 01:26	
Terphenyl-d14	68	22 - 127	09/24/20 01:26	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 15:16
Sample Matrix:	Water	**Date Received:**	09/14/20 16:15
Sample Name:	AV-08	**Units:**	ng/L
Lab Code:	K2007938-007	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**73**	X	3.4	0.40	1	09/23/20 20:32	9/17/20	
Acenaphthene	**30000**		170	18	50	09/24/20 15:25	9/17/20	
Acenaphthylene	**370**		34	3.7	10	09/24/20 02:02	9/17/20	
Anthracene	**1800**		3.4	0.29	1	09/23/20 20:32	9/17/20	
Benz(a)anthracene	**7.9**		3.4	0.34	1	09/23/20 20:32	9/17/20	
Benzo(a)pyrene	ND	U	3.4	0.41	1	09/23/20 20:32	9/17/20	
Benzo(b)fluoranthene	ND	U	3.4	0.25	1	09/23/20 20:32	9/17/20	
Benzo(g,h,i)perylene	**0.83**	J	3.4	0.36	1	09/23/20 20:32	9/17/20	
Benzo(k)fluoranthene	ND	U	3.4	0.41	1	09/23/20 20:32	9/17/20	
Chrysene	**26**		3.4	0.65	1	09/23/20 20:32	9/17/20	
Dibenz(a,h)anthracene	ND	U	3.4	0.45	1	09/23/20 20:32	9/17/20	
Dibenzofuran	**10000**		34	4.2	10	09/24/20 02:02	9/17/20	
Fluoranthene	**14**		3.4	0.46	1	09/23/20 20:32	9/17/20	
Fluorene	**5300**		34	4.2	10	09/24/20 02:02	9/17/20	
Indeno(1,2,3-cd)pyrene	ND	U	3.4	0.44	1	09/23/20 20:32	9/17/20	
Naphthalene	**1200**		3.4	0.71	1	09/23/20 20:32	9/17/20	
Phenanthrene	**57**	X	3.4	0.72	1	09/23/20 20:32	9/17/20	
Pyrene	**28**		3.4	0.78	1	09/23/20 20:32	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	72	39 - 123	09/23/20 20:32	
Fluorene-d10	91	28 - 125	09/24/20 02:02	
Terphenyl-d14	74	22 - 127	09/23/20 20:32	

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ2013290-03	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**0.42 J**	3.2	0.40	1	09/22/20 19:13	9/17/20	
Acenaphthene	ND U	3.2	0.36	1	09/22/20 19:13	9/17/20	
Acenaphthylene	ND U	3.2	0.37	1	09/22/20 19:13	9/17/20	
Anthracene	ND U	3.2	0.29	1	09/22/20 19:13	9/17/20	
Benz(a)anthracene	**0.60 J**	3.2	0.34	1	09/22/20 19:13	9/17/20	
Benzo(a)pyrene	ND U	3.2	0.41	1	09/22/20 19:13	9/17/20	
Benzo(b)fluoranthene	**0.72 J**	3.2	0.25	1	09/22/20 19:13	9/17/20	
Benzo(g,h,i)perylene	ND U	3.2	0.36	1	09/22/20 19:13	9/17/20	
Benzo(k)fluoranthene	ND U	3.2	0.41	1	09/22/20 19:13	9/17/20	
Chrysene	ND U	3.2	0.65	1	09/22/20 19:13	9/17/20	
Dibenz(a,h)anthracene	ND U	3.2	0.45	1	09/22/20 19:13	9/17/20	
Dibenzofuran	**0.51 J**	3.2	0.42	1	09/22/20 19:13	9/17/20	
Fluoranthene	ND U	3.2	0.46	1	09/22/20 19:13	9/17/20	
Fluorene	ND U	3.2	0.42	1	09/22/20 19:13	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	3.2	0.44	1	09/22/20 19:13	9/17/20	
Naphthalene	**1.1 J**	3.2	0.71	1	09/22/20 19:13	9/17/20	
Phenanthrene	**0.89 J**	3.2	0.72	1	09/22/20 19:13	9/17/20	
Pyrene	ND U	3.2	0.78	1	09/22/20 19:13	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	89	39 - 123	09/22/20 19:13	
Fluorene-d10	72	28 - 125	09/22/20 19:13	
Terphenyl-d14	84	22 - 127	09/22/20 19:13	

Client: AECOM/URS Corporation **Service Request:** K2007938
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	Fluoranthene-d10 39-123	Fluorene-d10 28-125	Terphenyl-d14 22-127
AV-09	K2007938-001	81	73	72
AV-11	K2007938-002	83	71	77
AV-10	K2007938-003	77	67	66
AV-01	K2007938-004	79	65	73
AV-06	K2007938-005	74	99	30
AV-02	K2007938-006	86	79	68
AV-08	K2007938-007	72	91	74
Method Blank	KQ2013290-03	89	72	84
Lab Control Sample	KQ2013290-01	88	77	79
Duplicate Lab Control Sample	KQ2013290-02	94	83	87

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007938
Project:	IP Longview/60608686	**Date Analyzed:**	09/22/20
Sample Matrix:	Water	**Date Extracted:**	09/17/20

Duplicate Lab Control Sample Summary
Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method:	8270D	**Units:**	ng/L
Prep Method:	EPA 3520C	**Basis:**	NA
		Analysis Lot:	696230

	Lab Control Sample KQ2013290-01			Duplicate Lab Control Sample KQ2013290-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
2-Methylnaphthalene	345	500	69	364	500	73	42-108	5	30
Acenaphthene	354	500	71	375	500	75	58-98	6	30
Acenaphthylene	366	500	73	388	500	78	61-102	6	30
Anthracene	403	500	81	436	500	87	65-98	8	30
Benz(a)anthracene	401	500	80	440	500	88	67-96	9	30
Benzo(a)pyrene	397	500	79	436	500	87	68-107	9	30
Benzo(b)fluoranthene	378	500	76	406	500	81	69-104	7	30
Benzo(g,h,i)perylene	331	500	66	355	500	71	61-110	7	30
Benzo(k)fluoranthene	392	500	78	416	500	83	68-108	6	30
Chrysene	356	500	71	386	500	77	67-105	8	30
Dibenz(a,h)anthracene	364	500	73	392	500	78	54-118	7	30
Dibenzofuran	361	500	72	384	500	77	52-103	6	30
Fluoranthene	385	500	77	413	500	83	63-106	7	30
Fluorene	356	500	71	381	500	76	59-97	7	30
Indeno(1,2,3-cd)pyrene	365	500	73	400	500	80	61-115	9	30
Naphthalene	343	500	69	367	500	73	59-95	7	30
Phenanthrene	354	500	71	380	500	76	61-100	7	30
Pyrene	374	500	75	403	500	81	64-104	8	30

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December 09, 2020

Analytical Report for Service Request No: K2007962
Revised Service Request No: K2007962.02

Paul Kalina
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

RE: IP Longview / 60608686

Dear Paul,

Enclosed is the revised report for the sample(s) submitted to our laboratory September 15, 2020 For your reference, these analyses have been assigned our service request number **K2007962.**

The duplicate sulfate result for sample "99-EA3A" has been removed.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

We apologize for any inconvenience this may have created.

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

REVISED
7:21 am, Dec 09, 2020

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Table of Contents

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
)	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

ALS Environmental

Case Narrative

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client: AECOM/URS Corporation
Project: IP Longview
Sample Matrix: Water

Service Request: K2007962
Date Received: 09/15/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

Seven water samples were received for analysis at ALS Environmental on 09/15/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD) with this samples batch. A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Method 8270D\PAH SIM ULL, 09/23/2020: The detection limit for all analytes for samples AV-14 and 99-EA3A was elevated due to less than optimal sample volume received for analysis.

Method 8270D\PAH SIM ULL, 09/23/2020: The detection limit was elevated for all analytes in sample 97-6C and 04-6A . The sample extract was diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extract was highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. The reporting limits were adjusted to reflect the dilution.

Method 8270D\PAH SIM ULL, 09/23/2020: Samples 97-6C and 04-6A required dilution due to the presence of elevated levels of the following target compounds: 2-Methylnaphthalene, Naphthalene. The reporting limits are adjusted to reflect the dilution.

Method 8270D\PAH SIM ULL, 09/23/2020: The result for Dibenzofuran in 99-EA3A may contain a slight bias. The chromatogram indicated the presence of non-target components. The matrix interference may have resulted in a slight high bias in the affected sample. The result was flagged with "X" to indicate the issue.

Method 8270D, 09/23/2020: The result for Acenaphthene in AV-12 may contain a slight bias. The chromatogram indicated the presence of non-target components. The matrix interference may have resulted in a slight high bias in the affected sample. The result was flagged with "X" to indicate the issue.

Semivoa GC:

No significant anomalies were noted with this analysis.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Noe D. Oan Date 10/07/2020

ALS Environmental

Chain of Custody

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K2007962

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Chain-of-Custody

Form 202r8

WORKORDER #

PAGE 1 of 1

DISPOSAL: (By Lab) or Return to Client

PROJECT NAME	IP Longview	SAMPLER	
PROJECT No.	60608686	SITE ID	
		EDD FORMAT	
COMPANY NAME	AECOM	PURCHASE ORDER	
SEND REPORT TO	Paul Kalina/Anthony Palmieri	BILL TO COMPANY	
ADDRESS	1501 4th Avenue, Suite 1400	INVOICE ATTN TO	
CITY / STATE / ZIP	Seattle Washington, 98101-3655	ADDRESS	
PHONE	Phone: +1 (206) 438 2700	CITY / STATE / ZIP	
FAX	Fax: +1 (206) 438 2699	PHONE	
E-MAIL	paul.kalina@aecom.com	FAX	
		E-MAIL	

DATE: 9/15

TURNAROUND:

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	PAH - ULL 8270C SIM ULL (8)	PCP 8151 (8)	TPH (D/R) (1)	SO4 (8)	NO3-NO2 (3)	TOC (3)	Phosperous (3)	HPC (7)	HDB (7)	Benzo(a)anthracene EPA 8270 Selected Ion Monitoring (8)	Chrysene EPA 8270 Selected Ion Monitoring (8)	Naphthalene EPA 8270 Selected Ion Monitoring (8)	TPH-diesel NWTPH-Dx (1)
	97-6B		9/14	1535	1			X		X										
	97-6C		9/14	1645	1			X		X										
	04-6A		9/14	1745	1			X		X										
	AH4		9/15	0755	12			X	X	X	X	X	X	X	X	X				
	99-8834		9/15	0854	12			X	X	X	X	X	X	X	X	X				
	AH-13		9/15	0855	12			X	X	X	X	X	X	X	X	X				
	AH12		9/15	1023	12			X	X	X	X	X	X	X	X	X				

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:	QC PACKAGE (check below)
	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Anders Utter	9/15/20	1200
RECEIVED BY		Cody Graves	9/15/2020	1200
RELINQUISHED BY				
RECEIVED BY				
RELINQUISHED BY				
RECEIVED BY				

PM MH

Cooler Receipt and Preservation Form

Client AECOM Service Request K2007962

Received: 9/15/2020 Opened: 9/15/2020 By: [illegible] Unloaded: 9/15/2020 By: [illegible]

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N
4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
7.0		IR01		X	X		
13.9		↓		↓	↓		
17.3		↓		↓	↓		

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

SHORT HOLD TIME

Notes, Discrepancies, Resolutions: _____

ALS Environmental

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

REVISED
7:21 am, Dec 09, 2020

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Sulfate

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-14	K2007962-004	**0.42**	0.40	0.04	2	10/02/20 13:15	
99-EA3A	K2007962-005	**38.3**	2.0	0.2	10	10/06/20 15:53	
AV-13	K2007962-006	**0.41**	0.40	0.04	2	10/02/20 13:35	
AV-12	K2007962-007	**1.22**	0.40	0.04	2	10/02/20 13:44	
Method Blank	K2007962-MB1	ND U	0.20	0.02	1	10/02/20 12:31	
Method Blank	K2007962-MB2	ND U	0.20	0.02	1	10/02/20 19:39	
Method Blank	K2007962-MB3	ND U	0.20	0.02	1	10/06/20 09:00	
Method Blank	K2007962-MB4	ND U	0.20	0.02	1	10/06/20 13:42	
Method Blank	K2007962-MB5	ND U	0.20	0.02	1	10/06/20 16:59	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
		Date Analyzed:	10/06/20

Replicate Sample Summary

General Chemistry Parameters

Sample Name:	99-EA3A	**Units:**	mg/L
Lab Code:	K2007962-005	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2007962-005DUP Result	Average	RPD	RPD Limit
Sulfate	300.0	2.0	0.2	38.3	37.5	37.9	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

lient:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
		Date Analyzed:	10/6/20
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Sulfate

Sample Name:	99-EA3A	**Units:**	mg/L
Lab Code:	K2007962-005	**Basis:**	NA
Analysis Method:	300.0		
Prep Method:	None		

		Matrix Spike K2007962-005MS			Duplicate Matrix Spike K2007962-005DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Sulfate	38.3	57.7	20.0	97	58.0	20.0	98	90-110	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

ent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	10/02/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Sulfate

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	697781

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007962-LCS1	5.22	5.00	104	90-110
Lab Control Sample	K2007962-LCS2	5.09	5.00	102	90-110

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	10/06/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Sulfate

Analysis Method:	300.0	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	698167

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007962-LCS3	5.10	5.00	102	90-110
Lab Control Sample	K2007962-LCS4	5.11	5.00	102	90-110
Lab Control Sample	K2007962-LCS5	5.13	5.00	103	90-110

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Nitrate+Nitrite as Nitrogen

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-14	K2007962-004	ND U	0.050	0.006	1	09/30/20 17:22	9/30/20	
99-EA3A	K2007962-005	**0.040 J**	0.050	0.006	1	09/30/20 17:22	9/30/20	
AV-13	K2007962-006	ND U	0.050	0.006	1	09/30/20 17:22	9/30/20	
AV-12	K2007962-007	**0.035 J**	0.050	0.006	1	09/30/20 17:22	9/30/20	
Method Blank	K2007962-MB1	ND U	0.050	0.006	1	09/30/20 17:22	9/30/20	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	09/30/20
Sample Matrix:	Water	**Date Extracted:**	09/30/20

Lab Control Sample Summary
Nitrate+Nitrite as Nitrogen

Analysis Method:	353.2	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	697629

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007962-LCS1	16.9	16.1	105	90-110

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA

Phosphorus, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
AV-14	K2007962-004	**1.82**	0.10	0.02	5	09/22/20 16:16	9/22/20	
99-EA3A	K2007962-005	**0.941**	0.040	0.008	2	09/22/20 16:16	9/22/20	
AV-13	K2007962-006	**1.80**	0.10	0.02	5	09/22/20 16:16	9/22/20	
AV-12	K2007962-007	**0.286**	0.040	0.008	2	09/22/20 16:16	9/22/20	
Method Blank	K2007962-MB1	ND U	0.020	0.004	1	09/22/20 16:16	9/22/20	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	09/22/20
Sample Matrix:	Water	**Date Extracted:**	09/22/20

Lab Control Sample Summary
Phosphorus, Total

Analysis Method:	365.3	**Units:**	mg/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	696160

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007962-LCS1	2.56	2.75	93	85-115

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-14	K2007962-004	**40.7**	5.0	0.7	10	10/01/20 10:50	
99-EA3A	K2007962-005	**42.9**	5.0	0.7	10	10/01/20 10:50	
AV-13	K2007962-006	**41.7**	5.0	0.7	10	10/01/20 10:50	
AV-12	K2007962-007	**17.8**	5.0	0.7	10	10/01/20 10:50	
Method Blank	K2007962-MB1	ND U	0.50	0.07	1	10/01/20 10:50	

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	10/01/20
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	415.1	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	697883

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2007962-LCS1	25.4	25.0	102	83-117

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
Analysis Method:	ApplEnvMic12-90-3895-3896	**Units:**	MPN/100mL
Prep Method:	None	**Basis:**	NA

Hydrocarbon Degrading Bacteria

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-14	K2007962-004	ND U	900	-	1	09/15/20 18:40	
99-EA3A	K2007962-005	ND U	900	-	1	09/15/20 18:40	
AV-13	K2007962-006	ND U	900	-	1	09/15/20 18:40	
AV-12	K2007962-007	ND U	900	-	1	09/15/20 18:40	

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QA/QC Report

ient:	AECOM/URS Corporation	**Service Request:**	K2007962
roject	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
		Date Analyzed:	09/15/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	AV-14	**Units:**	MPN/100mL
Lab Code:	K2007962-004	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K2007962-004DUP Result	Average	RPD	RPD Limit
Hydrocarbon Degrading Bacteria	ApplEnvMic12-90-3895-3896	900	-	ND U	ND U	NC	NC	20

Results flagged with an asterisk (*) indicate values outside control criteria.

lts flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
Analysis Method:	SM 9215 B	**Units:**	CFU/mL
Prep Method:	None	**Basis:**	NA

Heterotrophic Plate Count

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
AV-14	K2007962-004	ND U	0.50	-	1	09/15/20 15:58	
99-EA3A	K2007962-005	**14.0**	0.50	-	1	09/15/20 15:58	
AV-13	K2007962-006	ND U	0.50	-	1	09/15/20 15:58	
AV-12	K2007962-007	**0.50**	0.50	-	1	09/15/20 15:58	

ALS Environmental

Diesel and Residual Range Organics

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 15:35
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	97-6B	**Units:**	ug/L
Lab Code:	K2007962-001	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**100 J**	250	11	1	09/22/20 00:05	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**73 J**	500	19	1	09/22/20 00:05	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	77	50 - 150	09/22/20 00:05	
n-Triacontane	80	50 - 150	09/22/20 00:05	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 16:45
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	97-6C	**Units:**	ug/L
Lab Code:	K2007962-002	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**3900 Z**	250	11	1	09/22/20 02:19	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**600 L**	500	19	1	09/22/20 02:19	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	76	50 - 150	09/22/20 02:19	
n-Triacontane	72	50 - 150	09/22/20 02:19	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 17:45
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	04-6A	**Units:**	ug/L
Lab Code:	K2007962-003	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**4500 Z**	250	11	1	09/22/20 02:42	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**650 L**	500	19	1	09/22/20 02:42	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	83	50 - 150	09/22/20 02:42	
n-Triacontane	78	50 - 150	09/22/20 02:42	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 07:55
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-14	**Units:**	ug/L
Lab Code:	K2007962-004	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**1200 Y**	250	11	1	09/22/20 01:35	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**1100 O**	500	19	1	09/22/20 01:35	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	87	50 - 150	09/22/20 01:35	
n-Triacontane	91	50 - 150	09/22/20 01:35	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 08:54
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	99-EA3A	**Units:**	ug/L
Lab Code:	K2007962-005	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**1100**	**Y**	250	11	1	09/22/20 01:57	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**620**	**O**	500	19	1	09/22/20 01:57	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	83	50 - 150	09/22/20 01:57	
n-Triacontane	85	50 - 150	09/22/20 01:57	

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dba ALS Environmental

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 08:55
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-13	**Units:**	ug/L
Lab Code:	K2007962-006	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**880 Y**	250	11	1	09/22/20 01:12	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**810 O**	500	19	1	09/22/20 01:12	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	70	50 - 150	09/22/20 01:12	
n-Triacontane	72	50 - 150	09/22/20 01:12	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 10:23
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-12	**Units:**	ug/L
Lab Code:	K2007962-007	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**130 J**	250	11	1	09/22/20 00:50	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**110 J**	500	19	1	09/22/20 00:50	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	75	50 - 150	09/22/20 00:50	
n-Triacontane	78	50 - 150	09/22/20 00:50	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2013185-03	**Basis:**	NA

Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (C12 - C25 DRO)	**11 J**	250	11	1	09/21/20 23:43	9/16/20	
Residual Range Organics (C25 - C36 RRO)	**20 J**	500	19	1	09/21/20 23:43	9/16/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	74	50 - 150	09/21/20 23:43	
n-Triacontane	77	50 - 150	09/21/20 23:43	

Client: AECOM/URS Corporation **Service Request:** K2007962
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Semi-Volatile Petroleum Products by GC/FID

Analysis Method: NWTPH-Dx
Extraction Method: EPA 3510C

Sample Name	Lab Code	o-Terphenyl 50-150	n-Triacontane 50-150
97-6B	K2007962-001	77	80
97-6C	K2007962-002	76	72
04-6A	K2007962-003	83	78
AV-14	K2007962-004	87	91
99-EA3A	K2007962-005	83	85
AV-13	K2007962-006	70	72
AV-12	K2007962-007	75	78
97-6B	KQ2013185-01	68	72
Method Blank	KQ2013185-03	74	77
Lab Control Sample	KQ2013185-02	85	85

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QA/QC Report

ient:	AECOM/URS Corporation	**Service Request:**	K2007962
Project	IP Longview/60608686	**Date Collected:**	09/14/20
Sample Matrix:	Water	**Date Received:**	09/15/20
		Date Analyzed:	09/22/20

Replicate Sample Summary
Semi-Volatile Petroleum Products by GC/FID

Sample Name:	97-6B	**Units:**	ug/L
Lab Code:	K2007962-001	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2013185-01 Result	Average	RPD	RPD Limit
Diesel Range Organics (C12 - C25 DRO)	NWTPH-Dx	250	11	100 J	100 J	104	1	30
Residual Range Organics (C25 - C36 RRO)	NWTPH-Dx	500	19	73 J	74 J	73.4	1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

lts flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	09/21/20
Sample Matrix:	Water	**Date Extracted:**	09/16/20

Lab Control Sample Summary
Semi-Volatile Petroleum Products by GC/FID

Analysis Method:	NWTPH-Dx	**Units:**	ug/L
Prep Method:	EPA 3510C	**Basis:**	NA
		Analysis Lot:	696026

Lab Control Sample
KQ2013185-02

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Diesel Range Organics (C12 - C25 DRO)	2720	3200	85	46-140
Residual Range Organics (C25 - C36 RRO)	1350	1600	85	45-159

ALS Environmental

Chlorinated Phenolics

ALS Environmental—Kelso Laboratory
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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 07:55
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-14	**Units:**	ug/L
Lab Code:	K2007962-004	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/23/20 01:44	9/18/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	95	71 - 127	09/23/20 01:44	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 08:54
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	99-EA3A	**Units:**	ug/L
Lab Code:	K2007962-005	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/23/20 02:01	9/18/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	89	71 - 127	09/23/20 02:01	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 08:55
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-13	**Units:**	ug/L
Lab Code:	K2007962-006	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/23/20 02:18	9/18/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	92	71 - 127	09/23/20 02:18	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 10:23
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-12	**Units:**	ug/L
Lab Code:	K2007962-007	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/23/20 02:35	9/18/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	93	71 - 127	09/23/20 02:35	

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2013421-04	**Basis:**	NA

Chlorinated Phenolics

Analysis Method: 8151A Modified
Prep Method: Method

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Pentachlorophenol (PCP)	ND U	0.25	0.071	1	09/23/20 01:09	9/18/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-2,6-dichlorophenol	93	71 - 127	09/23/20 01:09	

Client: AECOM/URS Corporation **Service Request:** K2007962
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Chlorinated Phenolics

Analysis Method: 8151A Modified
Extraction Method: Method

Sample Name	Lab Code	4-Bromo-2,6-dichlorophenol 71-127
AV-14	K2007962-004	95
99-EA3A	K2007962-005	89
AV-13	K2007962-006	92
AV-12	K2007962-007	93
Method Blank	KQ2013421-04	93
Lab Control Sample	KQ2013421-03	91
AV-12	KQ2013421-01	97
AV-12	KQ2013421-02	95

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20
Sample Matrix:	Water	**Date Received:**	09/15/20
		Date Analyzed:	09/23/20
		Date Extracted:	09/18/20

Duplicate Matrix Spike Summary
Chlorinated Phenolics

Sample Name:	AV-12	**Units:**	ug/L
Lab Code:	K2007962-007	**Basis:**	NA
Analysis Method:	8151A Modified		
Prep Method:	Method		

		Matrix Spike KQ2013421-01			Duplicate Matrix Spike KQ2013421-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pentachlorophenol (PCP)	ND U	8.87	10.0	89	8.70	10.0	87	44-135	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

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QA/QC Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	09/23/20
Sample Matrix:	Water	**Date Extracted:**	09/18/20

Lab Control Sample Summary
Chlorinated Phenolics

Analysis Method:	8151A Modified	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	696250

Lab Control Sample
KQ2013421-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Pentachlorophenol (PCP)	8.29	10.0	83	44-135

ALS Environmental

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

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REVISED
3:32 pm, Nov 25, 2020

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Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 15:35
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	97-6B	**Units:**	ng/L
Lab Code:	K2007962-001	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**0.85 J**	3.4	0.40	1	09/23/20 12:36	9/17/20	
Benz(a)anthracene	**1.9 J**	3.4	0.34	1	09/23/20 12:36	9/17/20	
Benzo(a)pyrene	**1.6 J**	3.4	0.41	1	09/23/20 12:36	9/17/20	
Benzo(b)fluoranthene	**2.0 J**	3.4	0.25	1	09/23/20 12:36	9/17/20	
Benzo(k)fluoranthene	**0.41 J**	3.4	0.41	1	09/23/20 12:36	9/17/20	
Chrysene	ND U	3.4	0.65	1	09/23/20 12:36	9/17/20	
Dibenz(a,h)anthracene	**0.45 J**	3.4	0.45	1	09/23/20 12:36	9/17/20	
Dibenzofuran	**0.60 J**	3.4	0.42	1	09/23/20 12:36	9/17/20	
Indeno(1,2,3-cd)pyrene	**3.2 J**	3.4	0.44	1	09/23/20 12:36	9/17/20	
Naphthalene	**3.2 J**	3.4	0.71	1	09/23/20 12:36	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
]oranthene-d10	77	39 - 123	09/23/20 12:36	
.uorene-d10	67	28 - 125	09/23/20 12:36	
Terphenyl-d14	73	22 - 127	09/23/20 12:36	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 16:45
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	97-6C	**Units:**	ng/L
Lab Code:	K2007962-002	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**140000**		3400	400	1000	09/23/20 09:31	9/17/20	
Benz(a)anthracene	**950**		170	17	50	09/23/20 15:39	9/17/20	
Benzo(a)pyrene	**320**		170	21	50	09/23/20 15:39	9/17/20	
Benzo(b)fluoranthene	**430**		170	13	50	09/23/20 15:39	9/17/20	
Benzo(k)fluoranthene	**180**		170	21	50	09/23/20 15:39	9/17/20	
Chrysene	**730**		170	33	50	09/23/20 15:39	9/17/20	
Dibenz(a,h)anthracene	**33**	J	170	23	50	09/23/20 15:39	9/17/20	
Dibenzofuran	**97000**		170	21	50	09/23/20 15:39	9/17/20	
Indeno(1,2,3-cd)pyrene	**110**	J	170	22	50	09/23/20 15:39	9/17/20	
Naphthalene	**900000**		3400	710	1000	09/23/20 09:31	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	90	39 - 123	09/23/20 15:39	
Fluorene-d10	88	28 - 125	09/23/20 15:39	
Terphenyl-d14	77	22 - 127	09/23/20 15:39	

Analytical Report

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/14/20 17:45
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	04-6A	**Units:**	ng/L
Lab Code:	K2007962-003	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**140000**	3400	400	1000	09/23/20 10:08	9/17/20	
Benz(a)anthracene	**1200**	170	17	50	09/23/20 16:16	9/17/20	
Benzo(a)pyrene	**380**	170	21	50	09/23/20 16:16	9/17/20	
Benzo(b)fluoranthene	**550**	170	13	50	09/23/20 16:16	9/17/20	
Benzo(k)fluoranthene	**220**	170	21	50	09/23/20 16:16	9/17/20	
Chrysene	**910**	170	33	50	09/23/20 16:16	9/17/20	
Dibenz(a,h)anthracene	**36** J	170	23	50	09/23/20 16:16	9/17/20	
Dibenzofuran	**88000**	170	21	50	09/23/20 16:16	9/17/20	
Indeno(1,2,3-cd)pyrene	**130** J	170	22	50	09/23/20 16:16	9/17/20	
Naphthalene	**880000**	3400	710	1000	09/23/20 10:08	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
ioranthene-d10	78	39 - 123	09/23/20 16:16	
iorene-d10	80	28 - 125	09/23/20 16:16	
Terphenyl-d14	75	22 - 127	09/23/20 16:16	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 07:55
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-14	**Units:**	ng/L
Lab Code:	K2007962-004	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**17**	6.8	0.80	1	09/23/20 13:50	9/17/20	
Acenaphthene	**3100**	6.8	0.72	1	09/23/20 13:50	9/17/20	
Acenaphthylene	**27**	6.8	0.74	1	09/23/20 13:50	9/17/20	
Anthracene	**130**	6.8	0.58	1	09/23/20 13:50	9/17/20	
Benz(a)anthracene	ND U	6.8	0.68	1	09/23/20 13:50	9/17/20	
Benzo(a)pyrene	ND U	6.8	0.82	1	09/23/20 13:50	9/17/20	
Benzo(b)fluoranthene	ND U	6.8	0.50	1	09/23/20 13:50	9/17/20	
Benzo(g,h,i)perylene	ND U	6.8	0.72	1	09/23/20 13:50	9/17/20	
Benzo(k)fluoranthene	ND U	6.8	0.82	1	09/23/20 13:50	9/17/20	
Chrysene	ND U	6.8	1.3	1	09/23/20 13:50	9/17/20	
Dibenz(a,h)anthracene	ND U	6.8	0.90	1	09/23/20 13:50	9/17/20	
Dibenzofuran	**17**	6.8	0.84	1	09/23/20 13:50	9/17/20	
Fluoranthene	**40**	6.8	0.92	1	09/23/20 13:50	9/17/20	
Fluorene	**52**	6.8	0.84	1	09/23/20 13:50	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	6.8	0.88	1	09/23/20 13:50	9/17/20	
Naphthalene	**51**	6.8	1.5	1	09/23/20 13:50	9/17/20	
Phenanthrene	**46**	6.8	1.5	1	09/23/20 13:50	9/17/20	
Pyrene	**30**	6.8	1.6	1	09/23/20 13:50	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	89	39 - 123	09/23/20 13:50	
Fluorene-d10	80	28 - 125	09/23/20 13:50	
Terphenyl-d14	82	22 - 127	09/23/20 13:50	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 08:54
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	99-EA3A	**Units:**	ng/L
Lab Code:	K2007962-005	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**12**	7.1	0.84	1	09/23/20 14:26	9/17/20	
Acenaphthene	**5100**	35	3.8	5	09/23/20 17:29	9/17/20	
Acenaphthylene	**91**	7.1	0.78	1	09/23/20 14:26	9/17/20	
Anthracene	**320**	7.1	0.61	1	09/23/20 14:26	9/17/20	
Benz(a)anthracene	**5.1 J**	7.1	0.71	1	09/23/20 14:26	9/17/20	
Benzo(a)pyrene	**3.6 J**	7.1	0.86	1	09/23/20 14:26	9/17/20	
Benzo(b)fluoranthene	**9.8**	7.1	0.53	1	09/23/20 14:26	9/17/20	
Benzo(g,h,i)perylene	**2.0 J**	7.1	0.75	1	09/23/20 14:26	9/17/20	
Benzo(k)fluoranthene	**2.8 J**	7.1	0.86	1	09/23/20 14:26	9/17/20	
Chrysene	**6.5 J**	7.1	1.4	1	09/23/20 14:26	9/17/20	
Dibenz(a,h)anthracene	ND U	7.1	0.94	1	09/23/20 14:26	9/17/20	
Dibenzofuran	**7.0 JX**	7.1	0.88	1	09/23/20 14:26	9/17/20	
Fluoranthene	**12**	7.1	0.96	1	09/23/20 14:26	9/17/20	
Fluorene	**46**	7.1	0.88	1	09/23/20 14:26	9/17/20	
deno(1,2,3-cd)pyrene	**2.3 J**	7.1	0.92	1	09/23/20 14:26	9/17/20	
Naphthalene	**110**	7.1	1.5	1	09/23/20 14:26	9/17/20	
Phenanthrene	**16**	7.1	1.5	1	09/23/20 14:26	9/17/20	
Pyrene	**7.9**	7.1	1.7	1	09/23/20 14:26	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	72	39 - 123	09/23/20 14:26	
Fluorene-d10	61	28 - 125	09/23/20 14:26	
Terphenyl-d14	54	22 - 127	09/23/20 14:26	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 08:55
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-13	**Units:**	ng/L
Lab Code:	K2007962-006	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**15**	3.2	0.40	1	09/23/20 15:03	9/17/20	
Acenaphthene	**3500**	16	1.8	5	09/23/20 18:06	9/17/20	
Acenaphthylene	**19**	3.2	0.37	1	09/23/20 15:03	9/17/20	
Anthracene	**110**	3.2	0.29	1	09/23/20 15:03	9/17/20	
Benz(a)anthracene	ND U	3.2	0.34	1	09/23/20 15:03	9/17/20	
Benzo(a)pyrene	ND U	3.2	0.41	1	09/23/20 15:03	9/17/20	
Benzo(b)fluoranthene	ND U	3.2	0.25	1	09/23/20 15:03	9/17/20	
Benzo(g,h,i)perylene	ND U	3.2	0.36	1	09/23/20 15:03	9/17/20	
Benzo(k)fluoranthene	ND U	3.2	0.41	1	09/23/20 15:03	9/17/20	
Chrysene	ND U	3.2	0.65	1	09/23/20 15:03	9/17/20	
Dibenz(a,h)anthracene	ND U	3.2	0.45	1	09/23/20 15:03	9/17/20	
Dibenzofuran	**20**	3.2	0.42	1	09/23/20 15:03	9/17/20	
Fluoranthene	**55**	3.2	0.46	1	09/23/20 15:03	9/17/20	
Fluorene	**57**	3.2	0.42	1	09/23/20 15:03	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	3.2	0.44	1	09/23/20 15:03	9/17/20	
Naphthalene	**37**	3.2	0.71	1	09/23/20 15:03	9/17/20	
Phenanthrene	**90**	3.2	0.72	1	09/23/20 15:03	9/17/20	
Pyrene	**36**	3.2	0.78	1	09/23/20 15:03	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	84	39 - 123	09/23/20 15:03	
Fluorene-d10	80	28 - 125	09/23/20 15:03	
Terphenyl-d14	75	22 - 127	09/23/20 15:03	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	09/15/20 10:23
Sample Matrix:	Water	**Date Received:**	09/15/20 12:00
Sample Name:	AV-12	**Units:**	ng/L
Lab Code:	K2007962-007	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**3.3 J**	3.4	0.40	1	09/23/20 13:13	9/17/20	
Acenaphthene	**1.2 JX**	3.4	0.36	1	09/23/20 13:13	9/17/20	
Acenaphthylene	**3.0 J**	3.4	0.37	1	09/23/20 13:13	9/17/20	
Anthracene	**77**	3.4	0.29	1	09/23/20 13:13	9/17/20	
Benz(a)anthracene	**2.2 J**	3.4	0.34	1	09/23/20 13:13	9/17/20	
Benzo(a)pyrene	ND U	3.4	0.41	1	09/23/20 13:13	9/17/20	
Benzo(b)fluoranthene	ND U	3.4	0.25	1	09/23/20 13:13	9/17/20	
Benzo(g,h,i)perylene	ND U	3.4	0.36	1	09/23/20 13:13	9/17/20	
Benzo(k)fluoranthene	ND U	3.4	0.41	1	09/23/20 13:13	9/17/20	
Chrysene	**3.0 J**	3.4	0.65	1	09/23/20 13:13	9/17/20	
Dibenz(a,h)anthracene	ND U	3.4	0.45	1	09/23/20 13:13	9/17/20	
Dibenzofuran	**1.2 J**	3.4	0.42	1	09/23/20 13:13	9/17/20	
Fluoranthene	**7.0**	3.4	0.46	1	09/23/20 13:13	9/17/20	
Fluorene	**4.7**	3.4	0.42	1	09/23/20 13:13	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	3.4	0.44	1	09/23/20 13:13	9/17/20	
Naphthalene	**13**	3.4	0.71	1	09/23/20 13:13	9/17/20	
Phenanthrene	**5.7**	3.4	0.72	1	09/23/20 13:13	9/17/20	
Pyrene	**74**	3.4	0.78	1	09/23/20 13:13	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	85	39 - 123	09/23/20 13:13	
Fluorene-d10	75	28 - 125	09/23/20 13:13	
Terphenyl-d14	78	22 - 127	09/23/20 13:13	

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KQ2013290-03	**Basis:**	NA

Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2-Methylnaphthalene	**0.42 J**	3.2	0.40	1	09/22/20 19:13	9/17/20	
Acenaphthene	ND U	3.2	0.36	1	09/22/20 19:13	9/17/20	
Acenaphthylene	ND U	3.2	0.37	1	09/22/20 19:13	9/17/20	
Anthracene	ND U	3.2	0.29	1	09/22/20 19:13	9/17/20	
Benz(a)anthracene	**0.60 J**	3.2	0.34	1	09/22/20 19:13	9/17/20	
Benzo(a)pyrene	ND U	3.2	0.41	1	09/22/20 19:13	9/17/20	
Benzo(b)fluoranthene	**0.72 J**	3.2	0.25	1	09/22/20 19:13	9/17/20	
Benzo(g,h,i)perylene	ND U	3.2	0.36	1	09/22/20 19:13	9/17/20	
Benzo(k)fluoranthene	ND U	3.2	0.41	1	09/22/20 19:13	9/17/20	
Chrysene	ND U	3.2	0.65	1	09/22/20 19:13	9/17/20	
Dibenz(a,h)anthracene	ND U	3.2	0.45	1	09/22/20 19:13	9/17/20	
Dibenzofuran	**0.51 J**	3.2	0.42	1	09/22/20 19:13	9/17/20	
Fluoranthene	ND U	3.2	0.46	1	09/22/20 19:13	9/17/20	
Fluorene	ND U	3.2	0.42	1	09/22/20 19:13	9/17/20	
Indeno(1,2,3-cd)pyrene	ND U	3.2	0.44	1	09/22/20 19:13	9/17/20	
Naphthalene	**1.1 J**	3.2	0.71	1	09/22/20 19:13	9/17/20	
Phenanthrene	**0.89 J**	3.2	0.72	1	09/22/20 19:13	9/17/20	
Pyrene	ND U	3.2	0.78	1	09/22/20 19:13	9/17/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	89	39 - 123	09/22/20 19:13	
Fluorene-d10	72	28 - 125	09/22/20 19:13	
Terphenyl-d14	84	22 - 127	09/22/20 19:13	

Client: AECOM/URS Corporation **Service Request:** K2007962
Project: IP Longview/60608686
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	Fluoranthene-d10 39-123	Fluorene-d10 28-125	Terphenyl-d14 22-127
97-6B	K2007962-001	77	67	73
97-6C	K2007962-002	90	88	77
04-6A	K2007962-003	78	80	75
AV-14	K2007962-004	89	80	82
99-EA3A	K2007962-005	72	61	54
AV-13	K2007962-006	84	80	75
AV-12	K2007962-007	85	75	78
Method Blank	KQ2013290-03	89	72	84
Lab Control Sample	KQ2013290-01	88	77	79
Duplicate Lab Control Sample	KQ2013290-02	94	83	87

Client:	AECOM/URS Corporation	**Service Request:**	K2007962
Project:	IP Longview/60608686	**Date Analyzed:**	09/22/20
Sample Matrix:	Water	**Date Extracted:**	09/17/20

Duplicate Lab Control Sample Summary
Polynuclear Aromatic Hydrocarbons by GC/MS SIM Ultra Low Level

Analysis Method:	8270D	**Units:**	ng/L
Prep Method:	EPA 3520C	**Basis:**	NA
		Analysis Lot:	696230

	Lab Control Sample KQ2013290-01			Duplicate Lab Control Sample KQ2013290-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
2-Methylnaphthalene	345	500	69	364	500	73	42-108	5	30
Acenaphthene	354	500	71	375	500	75	58-98	6	30
Acenaphthylene	366	500	73	388	500	78	61-102	6	30
Anthracene	403	500	81	436	500	87	65-98	8	30
Benz(a)anthracene	401	500	80	440	500	88	67-96	9	30
Benzo(a)pyrene	397	500	79	436	500	87	68-107	9	30
Benzo(b)fluoranthene	378	500	76	406	500	81	69-104	7	30
Benzo(g,h,i)perylene	331	500	66	355	500	71	61-110	7	30
Benzo(k)fluoranthene	392	500	78	416	500	83	68-108	6	30
Chrysene	356	500	71	386	500	77	67-105	8	30
Dibenz(a,h)anthracene	364	500	73	392	500	78	54-118	7	30
Dibenzofuran	361	500	72	384	500	77	52-103	6	30
Fluoranthene	385	500	77	413	500	83	63-106	7	30
Fluorene	356	500	71	381	500	76	59-97	7	30
Indeno(1,2,3-cd)pyrene	365	500	73	400	500	80	61-115	9	30
Naphthalene	343	500	69	367	500	73	59-95	7	30
Phenanthrene	354	500	71	380	500	76	61-100	7	30
Pyrene	374	500	75	403	500	81	64-104	8	30

ALS Environmental

Raw Data

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Appendix E
Laboratory Quality Assurance Reviews

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Memorandum

To	Paul Kalina, Project Manager	Info	FINAL
Subject	Summary Data Quality Review IP – Longview Groundwater Monitoring – March 2020 ALS Laboratory Groups K2002766 and K2002824		
From	Chelsey Cook, Chemist Lucy Panteleeff, Chemist		
Date	May 14, 2020		

The summary data quality review of 10 groundwater samples collected on April 1 and April 2, 2020, has been completed. The samples were submitted to the ALS Environmental (ALS) laboratory located in Kelso, Washington. Samples were analyzed for total petroleum hydrocarbons (TPH, diesel and residual range) by Washington State Department of Ecology (Ecology) Method NWTPH-Dx, low-level polycyclic aromatic hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 8270D modified by selected ion monitoring (SIM), pentachlorophenol (PCP) by EPA Method 8151A Modified, nitrate-nitrite by EPA Method 353.2, total phosphorus by EPA Method 365.3, sulfate by EPA Method 300.0, total organic carbon (TOC) by EPA Method 415.1, hydrocarbon degrading bacteria (HDB) by a method derived from abstract number 3895-3896 from the December 1990 issue of Applied and Environmental Microbiology (AEM), and/or heterotrophic plate count (HPC) by Standard Method (SM) 9215B. The analyses were performed in general accordance with methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846)*, *Methods for Chemical Analysis of Water and Wastes*, March 1983, *Technical Addition to Methods for Chemical Analysis of Water and Wastes*, March 1984, Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997, and Standard Methods for the Examination of Water and Wastewater. The following samples are associated with ALS laboratory groups K2002766 and K2002824:

Sample ID	ALS ID	Parameters
AV-09	K2002766-001	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-11	K2002766-002	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-10	K2002766-003	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
99-EA3A	K2002766-004	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
97-6B	K2002824-001	PAHs, TPH
04-6A	K2002824-002	PAHs, TPH
97-6A	K2002824-003	PAHs, TPH
AV-13	K2002824-004	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-12	K2002824-005	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-14	K2002824-006	PAHs, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB

Upon receipt by ALS, the sample jar information was compared to the associated chain-of-custody (COC). The cooler and cooler blank temperatures were recorded. One of the four coolers was

received above the EPA-recommended limits of greater than 0°C and less than or equal to 6°C at a temperature of 6.3°C. Data were not qualified based on the cooler temperature.

Data validation is based on method performance criteria and quality control (QC) criteria as documented in the *Quality Assurance Project Plan (QAPP), Maintenance Facility Area, Former International Paper Facility, Longview, Washington, June 2008* (URS Corporation, 2008). Current laboratory and method control limits were used for data evaluation. The data review conducted on these laboratory groups included a review of summarized results and quality assurance (QA)/QC data, per the requirements set forth in Section 10.0 of the QAPP. Holding times, initial and continuing calibrations, method blanks, surrogate recoveries, internal standards, instrument tuning, laboratory control sample (LCS) results, matrix duplicate results, matrix spike/matrix spike duplicate (MS/MSD) results, field duplicates, and reporting limits were reviewed to assess compliance with applicable methods. Calculation checks and review of the raw data were not included in the data review. If data qualification was required, data were qualified in accordance with *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017, and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017. A summary of qualifiers assigned to the results reported in the laboratory groups noted above can be found in Table 1 at the end of this report.

Organic Analyses

Samples were analyzed for PAHs, TPH, and/or PCP by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Instrument Performance (Tunes – applicable to PAHs only) – Acceptable

3. Initial Calibrations – Acceptable

4. Continuing Calibration Verifications – Acceptable except as noted below:

   PAHs by Method 8270D-SIM – The percent differences (%Ds) for 2-methylnaphthalene (24.1%) and indeno(1,2,3-cd)pyrene (25.1%) were outside of the control limits of ±20% in the continuing calibration verification (CCV) analyzed on 4/10/2020. 2-Methylnaphthalene was qualified as estimated and flagged 'J' in AV-09, AV-11, AV-10, 99-EA3A, 97-6B, 04-6A, 97-6C, AV-13, AV-12, and AV-14 and indeno(1,2,3-cd)pyrene was qualified as estimated and flagged 'J' in AV-09, AV-10, 99-EA3A, 97-6B, 04-6A, 97-6C, AV-13, and AV-14 based on these CCV results.

   PCP by Method 8151M – The %Ds for the surrogate 4-bromo-2,6-dichlorophenol were outside of the control limits of ±20% on one of the analytical columns in the CCVs analyzed on 4/2/2020 (25.8%) and 4/6/2020 (23.0%). Data were not qualified based on surrogate %Ds.

5. Blanks – Acceptable except as noted below:

   NWTPH-Dx – The following TPHs were detected in the method blanks at concentrations between the method detection limits (MDLs) and the reporting limits:

Preparation Date:	Diesel-range TPH (ug/L)	Residual-range TPH (ug/L)
April 2, 2020	13	30
April 7, 2020	ok	21

ok – result is acceptable

Diesel-range TPH in AV-11 and 99-EA3A and residual-range TPH in AV-09, AV-11, 99-EA3A, 97-6B, 04-6A, 97-6C, and AV-12 were reported at concentrations between the MDLs and the reporting limits, qualified as not detected, and flagged 'U' at the reporting limits. Diesel-range TPH in AV-09 and residual-range TPH in AV-13 and AV-14 were between 1 and 2 times the reporting limits, qualified as estimated, and flagged 'J' at the results. Diesel-range and residual-range TPH in all other samples associated with these method blanks were reported at concentrations significantly above the blank contamination; therefore, no further data were qualified based on these method blank results.

PAHs by Method 8270D-SIM – The following PAHs were detected in the method blank extracted on 4/3/20 at concentrations between the MDLs and the reporting limits:

Analyte	Method Blank Concentration (ug/L)
Benz(a)anthracene	0.50
Phenanthrene	0.77

The results for phenanthrene in AV-11 was reported at a concentration between the MDL and reporting limit, qualified as not detected, and flagged 'U' at the reporting limit. The results for benzo(a)anthracene in 99-EA3A and AV-12 were between 1 and 2 times the reporting limits, qualified as estimated, and flagged 'J' at the results. The results for benzo(a)anthracene and phenanthrene in all other samples associated with this method blank were either not detected or reported at a concentration significantly above the blank contamination; therefore, no data further were qualified based on the method blank results.

6. Surrogates – Acceptable

7. Internal Standards (applicable to PAHs only) – Acceptable

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable

9. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable

NWTPH-Dx – An MS/MSD was not performed using a sample from these laboratory groups. Accuracy and precision were assessed using the LCS/LCSD results.

PAHs by Method 8270D-SIM – An MS/MSD was not performed using a sample from these laboratory groups. Accuracy and precision were assessed using the LCS/LCSD results.

PCP by Method 8151M – MS/MSDs were performed using 99-EA3A and AV-14. Results were acceptable.

10. Duplicates – Acceptable

NWTPH-Dx – A laboratory duplicate was performed using 99-EA3A. Results were comparable.

11. Field Duplicates – Acceptable

General – Field duplicates were submitted for samples AV-13 (PAHs, TPH, and PCP) and 04-6A (PAHs and TPH) and identified as AV-14 and 97-6C, respectively. Results were comparable.

12. Reporting Limits – Acceptable except as noted below:

General – The results for one or more organic analytes in several samples were flagged with a 'J' by the laboratory indicating that the reported concentrations were above the MDLs and below the reporting limits. All J-flagged results are considered estimated unless otherwise qualified as described in this report.

PAHs by Method 8270D-SIM - The reporting limit for dibenz(a,h)anthracene reported as not detected in AV-10 was elevated due to the dilution performed for high concentrations of target analytes present in the samples. The elevated reporting limit may affect the use of the data for regulatory comparison.

The laboratory noted that one or more organic analytes in AV-09, 99-EA3A, and 97-6B may have been elevated due to the presence of non-target analytes. These results were flagged 'X' by the laboratory. The results for 'X' flagged analytes in these samples were qualified as estimated and flagged 'J' based on the potential high bias due to matrix interference unless otherwise qualified as described in this report.

NWTPH-Dx – The results for diesel-range and/or residual-range TPH in several samples were flagged 'L,' 'Y,' or 'Z' to indicate that the chromatographic fingerprint did not match the laboratory standard chromatogram. No additional validation qualifiers were assigned based on the 'L,' 'Y,' or 'Z' qualifiers assigned by the laboratory.

Conventional Analyses

Select samples were analyzed for nitrate-nitrite, total phosphorus, sulfate, TOC, HDB, and HPC by the methods specified in the introduction to this report.

1. Holding Times – Acceptable

2. Initial Calibrations – Acceptable where applicable

3. Continuing Calibration Verifications – Acceptable where applicable

4. Blanks – Acceptable except as noted below:

   TOC by Method 415.1 – TOC was detected in the method blank (0.10 mg/L) and one continuing calibration blank (0.38 mg/L) analyzed on April 4, 2020 at concentrations less than the laboratory reporting limits but above the MDLs. The concentrations for TOC in the samples associated with these blanks were reported above the laboratory reporting limits and significantly higher than the blank concentrations; therefore, no data were qualified based on this method blank result.

   Sulfate by Method 300.0 – Sulfate (0.04 mg/L) was detected in one continuing calibration blank analyzed on April 2, 2020 at a concentration less than the laboratory reporting limit but above the MDL. Samples were not associated with this continuing calibration blank; therefore, data were not qualified based on this blank result.

5. Laboratory Control Sample – Acceptable where applicable

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable (where applicable) except as noted below:

   Nitrate-nitrite by Method 353.2 – An MS/MSD was performed using 99-EA3A. The percent recoveries for nitrate-nitrite in the MS (75%) and the MSD (77%) were below the control limits of 90-110%. The result for nitrate-nitrite in 99-EA3A was qualified as estimated and flagged 'J' based on the low MS/MSD recoveries.

   Total Phosphorus by Method 365.3 – An MS/MSD was performed using 99-EA3A. The percent recoveries for total phosphorus in the MS (49%) and MSD (45%) were below the control limits of 60-135%. The result for total phosphorus in 99-EA3A was qualified as estimated and flagged 'J' based on the low MS/MSD recoveries.

   Sulfate by Method 300.0 – An MS/MSD was performed using AV-13. Results were acceptable.

   TOC by Method 415.1 – A matrix spike was performed using AV-11. Results were acceptable.

7. Laboratory Duplicates – Acceptable

   Nitrate-nitrite by Method 353.2 – A laboratory duplicate was performed using 99-EA3A. Results were comparable.

   Total Phosphorus by Method 365.3 – A laboratory duplicate was performed using 99-EA3A. Results were comparable.

   Sulfate by Method 300.0 – A laboratory duplicate was performed using AV-13. Results were comparable.

   TOC by Method 415.1 – Laboratory duplicates were performed on AV-09, AV-11, AV-10, 99-EA3A, AV-13, AV-12, and AV-14. Results were comparable.

HDB AEM 3895-3896 – A laboratory duplicate was not performed in association with this analysis. Precision was not assessed using the field duplicate.

HDC by SM 9215B – A laboratory duplicate was not performed in association with this analysis. Precision was not assessed using the field duplicate.

8. Field Duplicates – Acceptable

General – A field duplicate was submitted for AV-13 and was identified as AV-14. Results were comparable.

9. Reporting Limits – Acceptable except as noted below:

General – Detection limit goals were not specified in the QAPP. The reporting limits provided by the laboratory are common levels reported by environmental laboratories and acceptable for project objectives.

One or more results in several samples were flagged with a 'J' by the laboratory indicating that the reported concentrations were above the MDLs and below the reporting limits. As described above, all J-flagged results are considered estimated unless otherwise qualified as described in this report.

Overall Assessment

The data reported in these laboratory groups, as qualified, are considered to be usable for meeting project objectives. The completeness for laboratory groups K2002766 and K2002824 is 100%.

Data Qualifier Definitions:

U The analyte was analyzed for but was not detected above the reported sample reporting limit.

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

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DNR Do Not Report. Another result is available that is more reliable.

IP – Longview
Groundwater Monitoring – March 2020
ALS Laboratory Groups K2002766 and K2002824

Table 1 - Summary of Qualified Data

Sample ID	Lab ID	Analyte	Units	Laboratory Result	Final Result
AV-09	K2002766-001	2-Methylnaphthalene	ng/L	9.8 X	9.8 J
AV-09	K2002766-001	Diesel Range Organics (DRO)	ug/L	320 Y	320 J
AV-09	K2002766-001	Fluorene	ng/L	62 X	62 J
AV-09	K2002766-001	Indeno(1,2,3-cd)pyrene	ng/L	21	21 J
AV-09	K2002766-001	Residual Range Organics (RRO)	ug/L	230 J	570 U
AV-11	K2002766-002	2-Methylnaphthalene	ng/L	2.0 J	2.0 J
AV-11	K2002766-002	Diesel Range Organics (DRO)	ug/L	45 J	290 U
AV-11	K2002766-002	Phenanthrene	ng/L	3.0 J	3.5 U
AV-11	K2002766-002	Residual Range Organics (RRO)	ug/L	83 J	570 U
AV-10	K2002766-003	2-Methylnaphthalene	ng/L	4600	4600 J
AV-10	K2002766-003	Indeno(1,2,3-cd)pyrene	ng/L	50	50 J
99-EA3A	K2002766-004	2-Methylnaphthalene	ng/L	7.4 X	7.4 J
99-EA3A	K2002766-004	Benz(a)anthracene	ng/L	3.8	3.8 J
99-EA3A	K2002766-004	Diesel Range Organics (DRO)	ug/L	190 J	290 U
99-EA3A	K2002766-004	Fluorene	ng/L	16 X	16 J
99-EA3A	K2002766-004	Indeno(1,2,3-cd)pyrene	ng/L	3.4 J	3.4 J
99-EA3A	K2002766-004	Naphthalene	ng/L	20 X	20 J
99-EA3A	K2002766-004	Nitrate+Nitrite as Nitrogen	mg/L	0.054	0.054 J
99-EA3A	K2002766-004	Phosphorus, Total	mg/L	0.572	0.572 J
99-EA3A	K2002766-004	Residual Range Organics (RRO)	ug/L	120 J	570 U
97-6B	K2002824-001	2-Methylnaphthalene	ng/L	3.7 X	3.7 J
97-6B	K2002824-001	Dibenzofuran	ng/L	3.5 X	3.5 J
97-6B	K2002824-001	Indeno(1,2,3-cd)pyrene	ng/L	26	26 J
97-6B	K2002824-001	Naphthalene	ng/L	17 X	17 J
97-6B	K2002824-001	Residual Range Organics (RRO)	ug/L	110 J	560 U
04-6A	K2002824-002	2-Methylnaphthalene	ng/L	85000	85000 J
04-6A	K2002824-002	Indeno(1,2,3-cd)pyrene	ng/L	220	220 J
04-6A	K2002824-002	Residual Range Organics (RRO)	ug/L	320 J	540 U
97-6C	K2002824-003	2-Methylnaphthalene	ng/L	89000	89000 J
97-6C	K2002824-003	Indeno(1,2,3-cd)pyrene	ng/L	180	180 J
97-6C	K2002824-003	Residual Range Organics (RRO)	ug/L	320 J	550 U
AV-13	K2002824-004	2-Methylnaphthalene	ng/L	93	93 J
AV-13	K2002824-004	Indeno(1,2,3-cd)pyrene	ng/L	3.3 J	3.3 J
AV-13	K2002824-004	Residual Range Organics (RRO)	ug/L	630 L	630 J
AV-12	K2002824-005	2-Methylnaphthalene	ng/L	59	59 J
AV-12	K2002824-005	Benz(a)anthracene	ng/L	6.2	6.2 J
AV-12	K2002824-005	Residual Range Organics (RRO)	ug/L	100 J	590 U
AV-14	K2002824-006	2-Methylnaphthalene	ng/L	90	90 J
AV-14	K2002824-006	Indeno(1,2,3-cd)pyrene	ng/L	3.6	3.6 J
AV-14	K2002824-006	Residual Range Organics (RRO)	ug/L	860 L	860 J

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Memorandum

To	Paul Kalina, Project Manager	Info	FINAL
Subject	Summary Data Quality Review IP – Longview Groundwater Monitoring – September 2020 ALS Laboratory Groups K2007938 and K2007962		
From	Chelsey Cook, Chemist Lucy Panteleeff, Chemist		
Date	November 30, 2020		

The summary data quality review of 14 groundwater samples collected on September 14 and September 15, 2020, has been completed. The samples were submitted to the ALS Environmental (ALS) laboratory located in Kelso, Washington. Samples were analyzed for total petroleum hydrocarbons (TPH, diesel and residual range) by Washington State Department of Ecology (Ecology) Method NWTPH-Dx, low-level polycyclic aromatic hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method 8270D modified by selected ion monitoring (SIM), pentachlorophenol (PCP) by EPA Method 8151M, nitrate-nitrite by EPA Method 353.2, total phosphorus by EPA Method 365.3, sulfate by EPA Method 300.0, total organic carbon (TOC) by EPA Method 415.1, hydrocarbon degrading bacteria (HDB) by a method derived from abstract number 3895-3896 from the December 1990 issue of Applied and Environmental Microbiology (AEM), and/or heterotrophic plate count (HPC) by Standard Method (SM) 9215B. The analyses were performed in general accordance with methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846)*, *Methods for Chemical Analysis of Water and Wastes*, March 1983, *Technical Addition to Methods for Chemical Analysis of Water and Wastes*, March 1984, Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997, and Standard Methods for the Examination of Water and Wastewater. The following samples are associated with ALS laboratory groups K2007938 and K2007962:

Sample ID	ALS ID	Parameters
AV-09	K2007938-001	PAH, TPH
AV-11	K2007938-002	PAH, TPH
AV-10	K2007938-003	PAH, TPH
AV-01	K2007938-004	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-06	K2007938-005	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-02	K2007938-006	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-08	K2007938-007	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
97-6B	K2007962-001	PAH, TPH
97-6C (field dup of 04-6A)	K2007962-002	PAH, TPH
04-6A	K2007962-003	PAH, TPH
AV-14	K2007962-004	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
99-EA3A	K2007962-005	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB

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Sample ID	ALS ID	Parameters
AV-13	K2007962-006	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB
AV-12	K2007962-007	PAH, PCP, TPH, Sulfate, Nitrate-Nitrite, TOC, Total Phosphorous, HPC, HDB

Upon receipt by ALS, the sample jar information was compared to the associated chain-of-custody (COC). The cooler and cooler blank temperatures were recorded. Four out of six coolers were received above the EPA-recommended limits of greater than 0°C and less than or equal to 6°C at temperatures ranging from 7.0°C to 17.3°C. Data were not qualified based on the cooler temperatures.

Data validation is based on method performance criteria and quality control (QC) criteria as documented in the *Quality Assurance Project Plan (QAPP), Maintenance Facility Area, Former International Paper Facility, Longview, Washington, June 2008* (URS Corporation, 2008). Current laboratory and method control limits were used for data evaluation. The data review conducted on these laboratory groups included a review of summarized results and quality assurance (QA)/QC data, per the requirements set forth in Section 10.0 of the QAPP. Holding times, initial and continuing calibrations, method blanks, surrogate recoveries, internal standards, instrument tuning, laboratory control sample (LCS) results, matrix duplicate results, matrix spike/matrix spike duplicate (MS/MSD) results, field duplicates, and reporting limits were reviewed to assess compliance with applicable methods. Calculation checks and review of the raw data were not included in the data review. If data qualification was required, data were qualified in accordance with *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017, and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017. A summary of qualifiers assigned to the results reported in the laboratory groups noted above can be found in Table 1 at the end of this report.

Organic Analyses

Samples were analyzed for PAHs, TPH, and/or PCP by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Instrument Performance (Tunes – applicable to PAHs only) – Acceptable

3. Initial Calibrations – Acceptable

4. Continuing Calibration Verifications – Acceptable except as noted below:

   PCP by Method 8151M – The percent differences for the surrogate 4-bromo-2,6-dichlorophenol exceeded the method control limits of ±20% in the following continuing calibration verifications (CCVs).

Analysis Date	Analyte	%D
9/16/2020 17:26	4-bromo-2,6-dichlorophenol	22.5%
9/16/2020 21:08	4-bromo-2,6-dichlorophenol	23.1%

Data were not qualified based on surrogate recoveries in CCVs.

PAHs by Method 8270D-SIM – The percent difference for 2-methylnaphthalene (38%) exceeded the method limits of ±20% in the CCV analyzed on September 23, 2020. 2-Methylnaphthalene was qualified as estimated and flagged 'J' in AV-06 and AV-02 based on this CCV result.

5. Blanks – Acceptable except as noted below:

NWTPH-Dx – The following TPHs were detected in the method blanks at concentrations between the method detection limits (MDLs) and the reporting limits:

Preparation Date:	Diesel-range TPH (ug/L)	Residual-range TPH (ug/L)
September 15, 2020	24	66
September 16, 2020	11	20

Diesel-range TPH in AV-09, AV-11, 97-6B, and AV-12, and residual-range TPH in AV-09, AV-11, AV-01, 97-6B, and AV-12 were reported at concentrations between the MDLs and the reporting limits; therefore, these results were qualified as not detected and flagged 'U' at the reporting limits. Diesel-range TPH in AV-10 and residual-range TPH in 97-6C, 04-6A, 99-EA3A, and AV-13 were between 1 and 2 times the reporting limits, qualified as estimated, and flagged 'J' at the results. Diesel-range and residual-range TPH in all other samples associated with these method blanks were reported at concentrations significantly above the blank contamination; therefore, no further data were qualified based on these method blank results.

PAHs by Method 8270D-SIM – The following PAHs were detected in the method blank extracted on September 17, 2020 at concentrations between the MDLs and the reporting limits:

Analyte	Detection (ug/L)	Samples Flagged 'U' at the Reporting Limit	Samples Flagged 'J'
2-Methylnaphthalene	0.42	AV-09, AV-11, 97-6B, AV-12	AV-01, 99-EA3A
Benz(a)anthracene	0.60	97-6B, 99-EA3A, AV-12	None
Benzo(b)fluoranthene	0.72	97-6B	99-EA3A
Dibenzofuran	0.51	AV-09, AV-11, 97-6B, 99-EA3A, AV-12	None
Naphthalene	1.1	AV-11, 97-6B	AV-09
Phenanthrene	0.89	AV-11	AV-01, AV-12

Data were qualified as indicated in the table above.

6. Surrogates – Acceptable except as noted below:

NWTPH-Dx – The percent recovery for o-terphenyl in AV-02 (157%) exceeded the control limit of 50-150%. The alternate surrogate n-triacontane was acceptable therefore, data were not qualified based on this surrogate recovery.

7. Internal Standards (applicable to PAHs only) – Acceptable

8. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable

9. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable

   NWTPH-Dx – MS/MSDs were not performed in association with this analysis. Accuracy and precision were assessed using the LCS/LCSD results.

   PAHs by Method 8270D-SIM – MS/MSDs were not performed in association with this analysis. Accuracy and precision were assessed using the LCS/LCSD results.

   PCP by Method 8151M – MS/MSDs were performed using AV-12 and AV-08. Results were acceptable.

10. Laboratory Duplicates - Acceptable

    NWTPH-Dx – Laboratory duplicates were performed using AV-09, AV-11, and 97-6B. Results were comparable.

11. Field Duplicates – Acceptable

    General – Field duplicates were submitted for samples AV-13 (PAHs, TPH, and PCP) and 04-6A (PAHs and TPH) and identified as AV-14 and 97-6C, respectively. Results were comparable with the following exception.

    PAHs by Method 8270D-SIM – The relative percent difference (RPD) for phenanthrene (65%) in the AV-13/AV-14 field duplicate pair exceeded 50%; therefore, the results were qualified as estimated and flagged 'J'.

12. Reporting Limits – Acceptable except as noted below:

    General – The results for one or more organic analytes in several samples were flagged with a 'J' by the laboratory indicating that the reported concentrations were above the MDLs and below the reporting limits. All J-flagged results are considered estimated unless otherwise qualified as described in this report.

    PAHs by Method 8270D-SIM - The result for dibenz(a,h)anthracene reported as not detected in AV-10 was elevated due to the dilution performed for high concentrations of target analytes present in the samples. The elevated reporting limit does not affect the use of the data for regulatory comparison.

    The laboratory noted that one or more organic analytes in 99-EA3A, AV-12, AV-10, AV-01, AV-02, and AV-08 may have been elevated due to matrix interference. These results were flagged 'X' by the laboratory. The results for 'X' flagged analytes in these samples were qualified as estimated and flagged 'J' based on the potential high bias due to matrix interference unless otherwise qualified as described in this report.

NWTPH-Dx – The results for diesel-range and/or residual-range TPH in several samples were flagged 'L,' 'Y,' 'O', or 'Z' to indicate that the chromatographic fingerprint did not match the laboratory standard chromatogram. No additional validation qualifiers were assigned based on the 'L,' 'Y,' 'O', or 'Z' qualifiers assigned by the laboratory.

Conventional Analyses

Select samples were analyzed for nitrate-nitrite, total phosphorus, sulfate, TOC, HDB, and HPC by the methods specified in the introduction to this report.

1. Holding Times – Acceptable

2. Initial Calibrations – Acceptable where applicable

3. Continuing Calibration Verifications – Acceptable where applicable

4. Blanks – Acceptable except as noted below:

   Nitrate-nitrite by Method 353.2 – Nitrate-nitrite was detected in the following continuing calibration blanks (CCBs) at concentrations between the MDLs and reporting limits:

Blank	Detection (mg/L)
CCB1 09/30/20 17:22	0.017
CCB4 09/30/20 17:22	0.016
CCB3 10/05/20 19:07	0.025

   Nitrate-nitrite was detected in 99-EA3A, AV-12, and AV-08 at concentrations between the MDLs and reporting limits; therefore, the nitrate-nitrite results in these samples were qualified as not detected and flagged 'U' at the reporting limits. Nitrate-nitrite was detected in AV-02 at a concentration greater than the MDL but less than 2 times the reporting limit; therefore, the result was qualified as estimated and flagged 'J'.

   Total Phosphorus by Method 365.3 – Total phosphorous was detected in the CCB (0.004 mg/L) analyzed on September 22, 2020 and the method blank (0.006 mg/L) analyzed on September 28, 2020 at concentrations between the MDLs and reporting limits. Total phosphorous was detected in the associated samples at concentrations greater than 10 times the blank concentrations; therefore, data were not qualified based on these blank results.

5. Laboratory Control Sample – Acceptable where applicable

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable where applicable except as noted below:

   Nitrate-nitrite by Method 353.2 – An MS/MSD was performed using AV-09. The percent recoveries in the MS (60%) and MSD (60%) were below the control limits of 90-110%. Nitrate-nitrite was qualified as estimated and flagged 'UJ' in AV-09 based on the MS/MSD results.

Total Phosphorus by Method 365.3 – An MS/MSD was not performed in association with this analysis. Accuracy was assessed using the LCS results. Precision was assessed using the field duplicate results.

Sulfate by Method 300.0 – MS/MSDs were performed using 99-EA3A and AV-10. Results were acceptable.

TOC by Method 415.1 – An MS/MSD was not performed in association with this analysis. Accuracy was assessed using the LCS results. Precision was assessed using the field duplicate results.

7. Laboratory Duplicates – Acceptable

Nitrate-nitrite by Method 353.2 – A laboratory duplicate was performed using AV-09. Results were comparable.

Total Phosphorus by Method 365.3 – A laboratory duplicate was not performed in associated with this analysis. Precision was assessed using field duplicate results.

Sulfate by Method 300.0 – Laboratory duplicates were performed using 99-EA3A and AV-10. Results were comparable.

TOC by Method 415.1 – A laboratory duplicate was not performed in associated with this analysis. Precision was assessed using field duplicate results.

HDB AEM 3895-3896 – A laboratory duplicate was performed using AV-14. Results were comparable.

HDC by SM 9215B – A laboratory duplicate was not performed in associated with this analysis. Precision was assessed using field duplicate results.

8. Field Duplicates – Acceptable

General – A field duplicate was submitted for AV-13 and was identified as AV-14. Results were comparable.

9. Reporting Limits – Acceptable except as noted below:

General – Detection limit goals were not specified in the QAPP. The reporting limits provided by the laboratory are common levels reported by environmental laboratories and acceptable for project objectives.

One or more results in several samples were flagged with a 'J' by the laboratory indicating that the reported concentrations were above the MDLs and below the reporting limits. As described above, all J-flagged results are considered estimated unless otherwise qualified as described in this report.

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Overall Assessment

The data reported in these laboratory groups, as qualified, are considered to be usable for meeting project objectives. The completeness for laboratory groups K2007938 and K2007962 is 100%.

Data Qualifier Definitions:

U The analyte was analyzed for but was not detected above the reported sample reporting limit.

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

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

DNR Do Not Report. Another result is available that is more reliable.

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Table 1 - Summary of Qualified Data

Sample ID	Lab ID	Analyte	Units	Laboratory Result	Final Result
AV-09	K2007938-001	2-Methylnaphthalene	ng/L	2.20 J	3.40 U
AV-09	K2007938-001	C12 - C25 DRO	ug/L	160 J	250 U
AV-09	K2007938-001	C25 - C36 RRO	ug/L	190 J	500 U
AV-09	K2007938-001	Dibenzofuran	ng/L	2.8 J	3.4 U
AV-09	K2007938-001	Naphthalene	ng/L	6.7	6.7 J
AV-09	K2007938-001	Nitrate+Nitrite as Nitrogen	mg/L	0.05 U	0.05 UJ
AV-11	K2007938-002	2-Methylnaphthalene	ng/L	1.3 J	3.4 U
AV-11	K2007938-002	C12 - C25 DRO	ug/L	65 J	250 U
AV-11	K2007938-002	C25 - C36 RRO	ug/L	130 J	500 U
AV-11	K2007938-002	Dibenzofuran	ng/L	0.96 J	3.4 U
AV-11	K2007938-002	Naphthalene	ng/L	2.6 J	3.4 U
AV-11	K2007938-002	Phenanthrene	ng/L	2.4 J	3.4 U
AV-10	K2007938-003	Benzo(g,h,i)perylene	ng/L	12 JX	12 J
AV-10	K2007938-003	C12 - C25 DRO	ug/L	4100	4100 J
AV-01	K2007938-004	2-Methylnaphthalene	ng/L	4.2 X	4.2 J
AV-01	K2007938-004	C25 - C36 RRO	ug/L	260 J	500 U
AV-01	K2007938-004	Fluorene	ng/L	10 X	10 J
AV-01	K2007938-004	Phenanthrene	ng/L	6.3	6.3 J
AV-06	K2007938-005	2-Methylnaphthalene	ng/L	19000	19000 J
AV-06	K2007938-005	Pentachlorophenol (PCP)	ug/L	0.11 JP	0.11 J
AV-02	K2007938-006	2-Methylnaphthalene	ng/L	9100	9100 J
AV-02	K2007938-006	Acenaphthylene	ng/L	630 X	630 J
AV-02	K2007938-006	Nitrate+Nitrite as Nitrogen	mg/L	0.152	0.152 J
AV-08	K2007938-007	2-Methylnaphthalene	ng/L	73 X	73 J
AV-08	K2007938-007	Nitrate+Nitrite as Nitrogen	mg/L	0.032 J	0.05 U
AV-08	K2007938-007	Phenanthrene	ng/L	57 X	57 J
97-6B	K2007962-001	2-Methylnaphthalene	ng/L	0.85 J	3.4 U
97-6B	K2007962-001	C12 - C25 DRO	ug/L	100 J	250 U
97-6B	K2007962-001	C25 - C36 RRO	ug/L	73 J	500 U
97-6B	K2007962-001	Naphthalene	ng/L	3.2 J	3.4 U
97-6B	K2007962-001	Benz(a)anthracene	ng/L	1.9 J	3.4 U
97-6B	K2007962-001	Benzo(b)fluoranthene	ng/L	2.0 J	3.4 U
97-6C	K2007962-002	C25 - C36 RRO	ug/L	600 L	600 J
04-6A	K2007962-003	C25 - C36 RRO	ug/L	650 L	650 J
AV-14	K2007962-004	Phenanthrene	ng/L	46	46 J
99-EA3A	K2007962-005	2-Methylnaphthalene	ng/L	12	12 J
99-EA3A	K2007962-005	Benz(a)anthracene	ng/L	5.1 J	7.1 U
99-EA3A	K2007962-005	Benzo(b)fluoranthene	ng/L	9.8	9.8 J
99-EA3A	K2007962-005	C25 - C36 RRO	ug/L	620 O	620 J
99-EA3A	K2007962-005	Dibenzofuran	ng/L	7 JX	7 J
99-EA3A	K2007962-005	Nitrate+Nitrite as Nitrogen	mg/L	0.04 J	0.05 U
AV-13	K2007962-006	C25 - C36 RRO	ug/L	810 O	810 J
AV-13	K2007962-006	Phenanthrene	ng/L	90	90 J
AV-12	K2007962-007	2-Methylnaphthalene	ng/L	3.3 J	3.4 U
AV-12	K2007962-007	Acenaphthene	ng/L	1.2 JX	1.2 J
AV-12	K2007962-007	Benz(a)anthracene	ng/L	2.2 J	3.4 U
AV-12	K2007962-007	C12 - C25 DRO	ug/L	130 J	250 U
AV-12	K2007962-007	C25 - C36 RRO	ug/L	110 J	500 U
AV-12	K2007962-007	Nitrate+Nitrite as Nitrogen	mg/L	0.035 J	0.05 U
AV-12	K2007962-007	Phenanthrene	ng/L	5.7	5.7 J