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Subject:

Former BP Facility No. WA-11060 (NW2463) - 2016 Annual Site Status Report

ENVIRONMENT

Date:

March 10, 2017

Contact:

Brian Marcum

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503-785-9406

Email:
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Our ref:

GP09BPNA.WA48

Site Address: 4580 Fauntleroy Way Southwest, Seattle, WA 98126

On behalf of BP West Coast Products, LLC. (BP), Arcadis U.S., Inc. is pleased to submit this annual summary of site activities conducted at the Former BP Facility No. 11060 (site) in 2016. Results and findings from work completed at the site are summarized below and in the attached data tables and figures.

Current Site Use: Active Station

2016 Groundwater Monitoring Summary

Groundwater Monitoring Schedule: Quarterly

Sample Methodology:

First Quarter:	No Purge and Sample
Second Quarter:	No Purge and Sample
Third Quarter:	No Purge and Sample
Fourth Quarter:	No Purge and Sample

Non-aqueous Phase Liquid Present at Site: Yes (thicknesses listed below)

First Quarter:	0.25 foot (EW-3), 1.40 feet (MW-4) – 3/2/2016
Second Quarter:	0.66 foot (EW-1), 1.53 feet (MW-4) – 6/6/2016
Third Quarter	0.73 foot (EW-1), 1.54 feet (EW-3), 1.11 feet (MW-4) – 9/12/2016
Fourth Quarter	0.79 foot (EW-1), 0.83 foot (EW-3) – 12/12/2016

Site Constituents of Concern above Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) during reporting period:

- Total Petroleum Hydrocarbons (TPH) as gasoline range organics (GRO):
  First Quarter (Q1) – GMW-1, MW-2, MW-5;
  Second Quarter (Q2) – GMW-1, MW-2, MW-5;
  Third Quarter (Q3) – GMW-1, MW-2, MW-3;
  Fourth Quarter (Q4) – MW-2, MW-4 and MW-5.
- TPH as diesel range organics:
  Q1 – MW-2;
  Q2 – MW-2;
  Q3 – MW-2;
  Q4 – MW-2, MW-4 and MW-5.
- TPH as heavy oil range organics (HO):
  Q1 – MW-5;
  Q2 – MW-2, MW-5;
  Q3 – MW-2;
  Q4 – MW-2.
- Benzene:
  Q1 – MW-2;
  Q2 – MW-2, MW-5;
  Q3 – MW-2,
  Q4 – MW-4.

Notes:
The method detection limit for HO is above the MTCA Method A CUL for Q4 at MW-5 monitoring well location.

On the duplicate of MW-2 for the fourth quarter, HO and DRO were detected in the method blank associated with the sample. The sample was re-extracted outside the method required holding time. All results are reported from the first trial. The results for the second trial are 540 micrograms per liter (ug/l) for DRO and non-detect for HO.

Observed Depth to Water per Event:

First Quarter:	12.99 (VE-3) to 25.61 (AS-6) feet below top of casing (btoc) – 3/2/2016
Second Quarter:	22.01 (MW-9) to 25.94 (EW-1) feet btoc – 6/6/2016
Third Quarter:	23.43 (MW-9) to 27.43 (MW-5) feet btoc – 9/12/2016
Fourth Quarter	22.42 (MW-3) to 25.58 (EW-3) feet btoc – 12/12/2016

Groundwater Elevations and Flow Direction:

Event	Elevation Range	Interpreted Groundwater Flow Direction
First Quarter:	241.06 (MW-9) to 244.23 (MW-4) feet above North American Vertical Datum 88 (NAVD 88)	Northeast
Second Quarter:	241.34 (MW-9) to 243.14 (MW-4) feet above NAVD 88	East Northeast
Third Quarter:	239.92 (MW-9) to 242.56 (EW-3) feet above NAVD 88	East Northeast
Fourth Quarter:	242.67 (MW-1) to 244.51 (MW-4) feet above NAVD 88	East

Note:
The groundwater gradient observed for the fourth quarter varies from usual gradient direction observed at the site due to absence of gauging at MW-9.

WA-11060
March10, 2017

2016 Remediation System Operation and Maintenance (O&M) Summary

System Startup Date:	April 20, 2016
Remedial Technology:	Air Sparge and Soil Vapor Extraction
System Operation:	Yes, Operations conducted in 2016 beginning April 20, 2016
System O&M Schedule:	Weekly during the first month of operation and monthly following the first month of operation
Total Operational Time in 2016:	2,968 hours
Operational Percentage in 2016:	51.74 percent
Permit Conditions Met:	Yes, Puget Sound Clean Air Agency (PSCAA)

Calculated Mass Removal Totals:

Calendar Year (2016)	Cumulative
VOC: 438.1 pounds (lbs)	VOC: 438.1
GRO: 1584.1 lbs	GRO: 1584.1 lbs

Note:
Estimated volatile organic compound (VOC) mass removed using photoionization detector field measurements.
Estimated GRO mass removed using analytical results.

2016 Additional Site Activities

No additional activities were conducted at the site in 2016.

If you have any questions please contact Brian Marcum at 503-785-9406 or Brian.Marcum@arcadis.com.

Sincerely,

Arcadis U.S., Inc.

Brian Marcum
Project Manager

Rebecca Andresen, L.G.
Vice President

State of Washington
2588
Licensed Geologist
Rebecca K. Andresen

Copies:

Richard Wright, Property Owner

Enclosures:

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Figure 5	Groundwater Elevation Contour Map with Analytical Results December 12, 2016
Figure 6	Historical Groundwater Gradient Direction Rose Diagram

Attachments

Attachment A	Groundwater Monitoring Field Data Sheets
Attachment B	Laboratory Report and Chain-of-Custody Documentation
Attachment C	Puget Sound Clean Air Agency Permit
Attachment D	Soil Vapor Extraction Laboratory Report and Chain-of-Custody Documentation

TABLES

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
AS-1	5/7/2015	(NS)	--	23.30	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
AS-1	3/2/2016	(NS)	--	23.31	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
AS-2	3/2/2016	(NS)	--	21.18	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
AS-3	3/2/2016	(NS)	--	21.63	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
AS-4	3/2/2016	(NS)	--	21.65	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
AS-5	3/2/2016	(DRY)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
AS-6	3/2/2016	(NS)	--	25.61	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
CW-2	3/2/2016	(NS)	--	19.53	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
CW-3	3/2/2016	(NS)	--	21.57	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
CW-4	3/2/2016	(NS)	--	20.61	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
EW-1	5/9/2013	(NAPL)	268.20	24.49	0.17	243.85	--	--	--	--	--	--	--	--	--	--	--	--
EW-1	5/7/2015	(NAPL)	268.20	25.75	1.02	243.27	--	--	--	--	--	--	--	--	--	--	--	--
EW-1	3/2/2016	(NS)	268.20	24.81	0.0	243.39	--	--	--	--	--	--	--	--	--	--	--	--
EW-1	6/6/2016	(NAPL)	268.20	25.94	0.66	242.79	--	--	--	--	--	--	--	--	--	--	--	--
EW-1	9/12/2016	(NAPL)	268.20	26.89	0.73	241.89	--	--	--	--	--	--	--	--	--	--	--	--
EW-1	12/12/2016	(NAPL)	268.20	25.49	0.79	243.34	--	--	--	--	--	--	--	--	--	--	--	--
EW-2	5/9/2013	(NS)	267.93	24.11	0.0	243.82	--	--	--	--	--	--	--	--	--	--	--	--
EW-2	5/7/2015	(NS)	267.93	24.78	0.0	243.15	--	--	--	--	--	--	--	--	--	--	--	--
EW-2	3/2/2016	(NS)	267.93	24.80	0.0	243.13	--	--	--	--	--	--	--	--	--	--	--	--
EW-2	6/6/2016	(NS)	267.93	25.17	0.0	242.76	--	--	--	--	--	--	--	--	--	--	--	--
EW-2	9/12/2016	(NS)	267.93	26.22	0.0	241.71	--	--	--	--	--	--	--	--	--	--	--	--
EW-2	12/12/2016	(NS)	267.93	24.64	0.0	243.29	--	--	--	--	--	--	--	--	--	--	--	--
EW-3	5/9/2013	(NAPL)	268.50	24.90	0.31	243.85	--	--	--	--	--	--	--	--	--	--	--	--
EW-3	5/7/2015	(NAPL)	268.50	25.77	2.54	244.76	--	--	--	--	--	--	--	--	--	--	--	--
EW-3	3/2/2016	(NAPL)	268.50	25.44	0.25	243.26	--	--	--	--	--	--	--	--	--	--	--	--
EW-3	9/12/2016	(NAPL)	268.50	27.17	1.54	242.56	--	--	--	--	--	--	--	--	--	--	--	--
EW-3	12/12/2016	(NAPL)	268.50	25.58	0.83	243.58	--	--	--	--	--	--	--	--	--	--	--	--
GMW-1	5/10/2011	(NP)	--	22.08	0.0	--	**5,930**	**1,900**	<420	2.4	<1.0	69.7	94.8	<1.0	--	--	**28.4**	--
GMW-1	11/29/2011	(NP)	--	23.83	0.0	--	**6,080**	**610**	<380	<1.0	<1.0	86.9	113	--	--	--	<10.0	--
GMW-1	6/1/2012	(NM)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GMW-1	11/29/2012	(NM)	265.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GMW-1	5/9/2013	(NP)	265.63	22.58	0.0	243.05	**1,010**	<420	<420	<1.0	<1.0	4.4	4.6	<1.0	--	--	<10.0	<10.0
GMW-1	11/19/2013	(NP)	265.63	24.00	0.0	241.63	**1,400**	**2,500**	<73	<0.50	<0.70	6.6	6.8	<0.50	--	--	**16.7**	1.2
GMW-1	5/13/2014	(NS)	265.63	22.83	0.0	242.80	--	--	--	--	--	--	--	--	--	--	--	--

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Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
GMW-1	5/14/2014	(NP)	265.63	--	--	--	590	**560**	<66	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	<4.7	<4.7
GMW-1	5/7/2015	(NP)	265.63	23.48	0.0	242.15	**1,600**	480	<66	<0.50	<0.50	10	10	<0.50	--	--	<4.7	<4.7
GMW-1	3/2/2016	(NP)	265.63	22.48	0.0	243.15	**1,400**	<46	<100	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
GMW-1	6/6/2016	(NP)	265.63	23.51	0.0	242.12	**3,300**	130	<100	<0.50	<0.50	5.3	4.0	<0.50	--	--	--	--
GMW-1	9/12/2016	(NP)	265.63	24.89	0.0	240.74	**4,600**	210	<67	<0.50	<0.50	32	34	<0.50	--	--	--	--
GMW-1	9/12/2016	(Dup)(NP)	265.63	24.89	0.0	240.74	**4,400**	310	120(J)	<0.50	<0.50	32	34	<0.50	--	--	--	--
GMW-1	12/12/2016	(NP)	265.63	22.95	0.0	242.68	350	<50	400	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-1	5/11/1993		99.89	23.02	--	76.87	**3,300**	--	--	**82**	11	8	14	--	--	--	--	--
MW-1	3/4/1994		99.89	24.32	--	75.57	**830**	**580**	--	**6**	3	3	11	--	--	--	**38**	<3
MW-1	7/6/1994		99.89	24.60	--	75.29	**900**	<250	--	5	<0.5	2	10	--	--	--	--	--
MW-1	10/7/1994		99.89	24.97	--	74.92	**1,500**	--	--	**6**	<0.5	3	11	--	--	--	--	--
MW-1	12/28/1994		99.89	24.86	--	75.03	**1,400**	--	--	5	<0.5	2	7	--	--	--	--	--
MW-1	3/13/1995		99.89	24.16	--	75.73	**1,400**	--	--	**16**	<0.5	3	9	--	--	--	--	--
MW-1	6/30/1995		99.89	23.98	--	75.91	**1,400**	--	--	4	<0.5	3	7	--	--	--	--	--
MW-1	9/6/1995		99.89	24.30	--	75.59	**1,300**	--	--	5	<0.5	3	6	--	--	--	--	--
MW-1	12/8/1995		99.89	24.41	--	75.48	**1,300**	--	--	**7**	2	2	7	--	--	--	--	--
MW-1	3/11/1996		99.89	23.11	--	76.78	**900**	--	--	3	<0.5	<0.5	1	--	--	--	--	--
MW-1	6/18/1996		99.89	22.80	--	77.09	400	--	--	1	1	<0.5	2	--	--	--	--	--
MW-1	9/9/1996		99.89	23.11	--	76.78	600	--	--	2	<0.5	1	1	13	--	--	--	--
MW-1	12/11/1996		99.89	23.07	--	76.82	710	--	--	4	2	2	4	<10	--	--	--	--
MW-1	3/13/1997		99.89	22.12	--	77.77	100	--	--	<0.5	<0.5	<0.5	<1.0	<5	--	--	--	--
MW-1	6/5/1997		99.89	21.75	--	78.14	250	--	--	2	2	<0.5	<1.5	5	--	--	--	--
MW-1	9/5/1997		99.89	22.03	--	77.86	300	--	--	**8**	4	2	6	8	--	--	--	--
MW-1	4/2/1998		99.89	21.27	--	78.62	210	--	--	1	3	<0.5	<1.5	<5	--	--	--	--
MW-1	6/8/1998		99.89	21.53	--	78.36	300	--	--	<0.5	3	1	4	6	--	--	--	--
MW-1	12/9/1998		99.89	22.22	--	77.67	<500	--	--	<0.5	<5.0	<5.0	<5.0	<5.0	--	--	--	--
MW-1	6/26/1999		99.89	21.08	--	78.81	<100	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	--	--
MW-1	9/28/1999		99.89	21.88	--	78.01	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	1/19/2000		99.89	21.46	--	78.43	<50	--	--	<0.5	4	1	3	<0.5	--	--	--	--
MW-1	3/24/2000		99.89	21.40	--	78.49	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	7/2/2000		99.89	21.92	--	77.97	120	--	--	1	<0.5	1	2	2	--	--	--	--
MW-1	9/14/2000		99.89	22.54	--	77.35	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/14/2000		99.89	22.81	--	77.08	**1,700**	--	--	**<10**	19	<10	<30	**<40**	--	--	--	--
MW-1	9/22/2001		99.89	23.55	--	76.34	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/9/2001		99.89	23.63	--	76.26	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	3/20/2002		99.89	22.88	--	77.01	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	6/11/2002		99.89	23.02	--	76.87	--	--	--	--	--	--	--	--	--	--	--	--

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WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-1	12/21/2002	(NS)	99.89	24.54	--	75.35	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	3/19/2003	(NS)	99.89	24.50	--	75.39	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	6/18/2003	(NS)	99.89	24.36	--	75.53	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	9/23/2003	(NS)	99.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	10/21/2003	(P)	99.89	25.04	--	74.85	**3,270**	--	--	**32.5**	4.61	17.3	19.2	<1.00	--	--	--	--
MW-1	6/29/2004	(NS)	99.89	24.22	--	75.67	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	11/15/2004	(NS)	99.89	25.11	--	74.78	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	4/14/2005	(NS)	99.89	25.10	--	74.79	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/18/2005	(NP)	99.89	25.46	--	74.43	**2,960**	--	--	**10.8**	2.04	1.23	2.76	<1.00	--	--	--	--
MW-1	6/11/2006	(NP)	99.89	24.54	--	75.35	**1,840**	--	--	**11.4**	1.12	1.6	2.34	19.8	--	--	--	--
MW-1	11/5/2006	(NP)	99.89	25.59	--	74.30	**3,880**	--	--	**73.2**	6.12	2.04	<6.00	--	--	--	--	--
MW-1	9/25/2007	(NP)	99.89	25.08	--	74.81	**1,640**	--	--	**27.8**	1.67	0.86	<3.00	--	--	--	--	--
MW-1	12/31/2007	(NP)	99.89	25.23	--	74.66	**1,970**	--	--	**22.7**	1.34	1.03	<3.00	--	--	--	--	--
MW-1	5/29/2008	(NP)	99.89	25.01	--	74.88	**2,370**	--	--	3.58	0.58	<0.500	<3.00	--	--	--	--	--
MW-1	10/28/2008	(NP)	99.89	25.80	--	74.09	**1,450**	--	--	2.8	1.07	<0.500	<3.00	--	--	--	--	--
MW-1	6/22/2009	(NP)	99.89	26.11	--	73.78	**2,200**	--	--	**30**	5.7	24	30.5	--	--	--	4.9	<2.00
MW-1	12/15/2009	(NP)	99.89	26.31	--	73.58	**1,500**	--	--	**11**	2	4.8	3.6	--	--	--	3.8	<2.00
MW-1	5/24/2010	(NP)	267.43	25.20	--	242.23	**940**	--	--	**18**	<2.5	<2.5	6.4	--	--	--	--	--
MW-1	5/24/2010	(Dup)(NP)	267.43	25.20	--	242.23	**940**	--	--	**22**	<2.5	<2.5	6.8	--	--	--	--	--
MW-1	10/12/2010	(NP)	267.43	25.09	0.0	242.34	**849**	--	--	2.8	<1.0	1.2	<3.0	5.2	--	--	<10.0	--
MW-1	5/10/2011	(NP)	267.43	23.60	0.0	243.83	642	**840**	<420	**17.8**	6.6	1.8	10.9	2.5	--	--	<10.0	--
MW-1	11/29/2011	(NP)	267.43	24.84	0.0	242.59	**815**	<75	<380	**5.5**	<1.0	<1.0	<3.0	--	--	--	10.3	--
MW-1	6/1/2012	(NP)	267.43	23.67	0.0	243.76	544	362	<396	3.6	<1.0	<1.0	3.0	7.4	--	--	<10.0	<10.0
MW-1	11/29/2012	(NP)	267.43	24.00	0.0	243.43	**1,320**	<430	<430	1.2	<1.0	<1.0	<3.0	<1.0	--	--	11.3	<3.0
MW-1	5/9/2013	(NP)	267.43	23.79	0.0	243.64	557	**620**	<430	**6.3**	<1.0	<1.0	4.1	1.6	--	--	<10.0	<10.0
MW-1	11/19/2013	(NP)	267.43	25.30	0.0	242.13	470	400	320	1.9(J)	<0.70	<0.80	1.7(J)	1.5(J)	--	--	4.8	0.15(J)
MW-1	5/13/2014	(NP)	267.43	24.12	0.0	243.31	490	250	110(J)	1.4	<0.50	<0.50	0.57(J)	0.67(J)	--	--	6.9(J)	<4.7
MW-1	5/7/2015	(NP)	267.43	24.26	0.0	243.17	610	270	190(J)	1.2	<0.50	<0.50	<0.50	<0.50	--	--	**18.7**	7.1(J)
MW-1	3/2/2016	(NP)	267.43	24.53	0.0	242.90	460	140	<110	1.2	<0.50	0.77(J)	3.0	<0.50	--	--	--	--
MW-1	6/6/2016	(NS)	267.43	24.82	0.0	242.61	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	9/12/2016	(NS, IW)	267.43	26.88	0.0	240.55	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/12/2016	(NS)	267.43	24.76	0.0	242.67	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	5/11/1993		99.05	22.98	--	76.07	**17,000**	--	--	**2,500**	48	100	240	--	--	--	--	--
MW-2	3/4/1994		99.05	24.30	--	74.75	**4,300**	**1,300**	--	**1,500**	20	130	180	--	--	--	5	<3
MW-2	7/6/1994		99.05	24.54	--	74.51	**4,400**	390	--	**1,100**	16	53	97	--	--	--	--	--
MW-2	10/7/1994		99.05	24.94	--	74.11	**4,400**	--	--	**1,100**	18	57	82	--	--	--	--	--
MW-2	12/28/1994		99.05	24.60	--	74.45	**2,100**	--	--	**250**	5	13	14	--	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-2	3/13/1995		99.05	23.84	--	75.21	**2,700**	--	--	**200**	12	29	50	--	--	--	--	--
MW-2	6/30/1995		99.05	23.72	--	75.33	**3,400**	--	--	**400**	8	50	39	--	--	--	--	--
MW-2	9/6/1995		99.05	23.97	--	75.08	**3,400**	--	--	**350**	8	50	35	--	--	--	--	--
MW-2	12/8/1995		99.05	23.97	--	75.08	**3,100**	--	--	**610**	5	29	36	--	--	--	--	--
MW-2	3/11/1996		99.05	22.66	--	76.39	**5,400**	--	--	**280**	12	100	120	--	--	--	--	--
MW-2	6/18/1996		99.05	22.18	--	76.87	**4,500**	--	--	**280**	12	130	56	--	--	--	--	--
MW-2	9/9/1996		99.05	22.72	--	76.33	**4,100**	--	--	**790**	5	78	35	<1.0	--	--	--	--
MW-2	12/11/1996		99.05	22.67	--	76.38	**3,700**	--	--	**460**	13	65	41	**43**	--	--	--	--
MW-2	3/13/1997		99.05	21.91	--	77.14	**3,200**	--	--	**140**	12	130	48	**<50**	--	--	--	--
MW-2	6/5/1997		99.05	21.06	--	77.99	**3,400**	--	--	**160**	22	180	79	**<100**	--	--	--	--
MW-2	9/5/1997		99.05	21.74	--	77.31	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	4/2/1998		99.05	20.71	--	78.34	**4,700**	--	--	**170**	51	35	210	**<50**	--	--	--	--
MW-2	6/8/1998		99.05	21.25	--	77.80	**3,800**	--	--	**420**	26	150	75	**140**	--	--	--	--
MW-2	9/17/1998		99.05	22.10	--	76.95	**2,900**	--	--	**720**	15	79	44	<5.0	--	--	--	--
MW-2	12/9/1998		99.05	21.99	--	77.06	**4,500**	--	--	**520**	8	100	62	<5.0	--	--	--	--
MW-2	3/17/1999		99.05	19.67	--	79.38	**5,000**	--	--	**19**	27	300	230	<5.0	--	--	--	--
MW-2	6/26/1999		99.05	21.26	--	77.79	**3,400**	--	--	**400**	29	160	130	13	--	--	--	--
MW-2	9/28/1999		99.05	21.75	--	77.30	**7,300**	--	--	**690**	20	23	110	**87**	--	--	--	--
MW-2	1/19/2000		99.05	21.12	--	77.93	**8,700**	--	--	**920**	20	260	74	<0.5	--	--	--	--
MW-2	3/24/2000		99.05	20.74	--	78.31	**10,000**	--	--	**310**	79	240	97	<5	--	--	--	--
MW-2	7/2/2000		99.05	21.51	--	77.54	**8,200**	--	--	**520**	35	190	85	**49**	--	--	--	--
MW-2	9/14/2000		99.05	22.31	--	76.74	**14,000**	--	--	**1,100**	100	110	100	<5	--	--	--	--
MW-2	12/14/2000		99.05	22.97	--	76.08	**15,000**	--	--	**740**	<10	68	<30	**<40**	--	--	--	--
MW-2	9/22/2001		99.05	23.59	--	75.46	**12,000**	--	--	**180**	9	240	110	20	--	--	--	--
MW-2	12/9/2001		99.05	23.27	--	75.78	**14,000**	--	--	**310**	9.5	100	96	<4.0	--	--	--	--
MW-2	3/20/2002		99.05	22.41	--	76.64	**15,000**	--	--	**250**	<5.0	220	98	**280**	--	--	--	--
MW-2	6/11/2002		99.05	22.61	--	76.44	**13,000**	--	--	**290**	<10	160	57	**<40**	--	--	--	--
MW-2	12/21/2002	(P)	99.05	24.30	--	74.75	**5,970**	--	--	**111**	13.4	211	70.3	**148**	--	--	--	--
MW-2	3/19/2003	(P)	99.05	23.90	0.0	75.15	**5,270**	--	--	**79.9**	8.71	156	55	**<25.0**	--	--	--	--
MW-2	6/18/2003	(P)	99.05	23.87	--	75.18	**6,770**	--	--	**36.7**	14.7	245	119	**143**	--	--	--	--
MW-2	9/23/2003	(P)	99.05	24.33	0.0	74.72	**6,490**	--	--	**40.5**	15.8	179	103	<20.0	--	--	--	--
MW-2	10/21/2003	(P)	99.05	24.38	--	74.67	**4,600**	--	--	**31.1**	9.38	86	61	<1.00	--	--	--	--
MW-2	6/29/2004	(NP)	99.05	23.74	--	75.31	**5,550**	--	--	**17.8**	11.2	228	76.5	**95.2**	--	--	--	--
MW-2	11/15/2004	(NP)	99.05	24.70	--	74.35	**5,670**	--	--	**12.3**	6.11	135	63.3	<2.00	--	--	--	--
MW-2	4/14/2005	(NP)	99.05	24.69	--	74.36	**4,680**	--	--	**130**	2.8	41.8	26.6	<2.00	--	--	--	--
MW-2	12/18/2005	(NP)	99.05	25.15	--	73.90	**5,700**	--	--	**122**	3.5	43.9	27.8	<5.00	--	--	--	--
MW-2	6/11/2006	(NP)	99.05	24.01	--	75.04	**5,450**	--	--	4.48	5.8	118	56.7	<2.00	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-2	11/5/2006	(NP)	99.05	25.40	--	73.65	**7,490**	--	--	**263**	<5.00	46.2	<30.0	--	--	--	--	--
MW-2	9/25/2007	(NP)	99.05	24.72	--	74.33	**7,530**	--	--	**715**	9.74	50.8	64	--	--	--	--	--
MW-2	12/31/2007	(NP)	99.05	24.67	--	74.38	**6,000**	--	--	**477**	10.6	69.3	76.3	--	--	--	--	--
MW-2	5/29/2008	(NP)	99.05	24.73	--	74.32	**9,600**	--	--	**648**	11.1	55.9	48.4	--	--	--	--	--
MW-2	10/28/2008	(NP)	99.05	25.74	--	73.31	**10,300**	--	--	**1,430**	16	194	145	--	--	--	--	--
MW-2	6/22/2009	(NP)	99.05	25.91	--	73.14	**4,800**	--	--	**1,200**	40	100	130	--	--	--	<2.00	<2.00
MW-2	12/15/2009	(NP)	99.05	25.87	--	73.18	**4,300**	--	--	**1,600**	8.2	66	82	--	--	--	<2.00	<2.00
MW-2	5/24/2010	(NP)	266.69	24.64	--	242.05	**4,200**	--	--	**320**	7.7	69	84	--	--	--	--	--
MW-2	10/12/2010	(NP)	266.69	25.03	0.0	241.66	**3,590**	--	--	**1,890**	14.8	54.8	39.7	15.5	--	--	<10.0	--
MW-2	5/10/2011	(NP)	266.69	23.23	0.0	243.46	**5,520**	**1,000**	**2,000**	**281**	4.2	69.9	49.9	7.3	--	--	<10.0	--
MW-2	5/10/2011	(Dup)(NP)	266.69	23.23	0.0	243.46	**5,000**	**850**	**1,600**	**156**	3.9	76.3	53.2	5.6	--	--	<10.0	--
MW-2	11/29/2011	(NP)	266.69	24.82	0.0	241.87	**5,640**	98	<380	**549**	7.0	82.6	61.6	--	--	--	<10.0	--
MW-2	6/1/2012	(NP)	266.69	23.60	0.0	243.09	**2,940**	**2,240**	**3,080**	**107**	12.7	64.2	46.1	5.0	--	--	10.0	<10.0
MW-2	11/29/2012	(NP)	266.69	23.86	0.0	242.83	**10,400**	**2,100**	**760**	**399**	10.2	187	154	14.7	--	--	7.7	3.2
MW-2	5/9/2013	(NP)	266.69	23.41	0.0	243.28	**3,660**	**1,700**	<400	**42.9**	6.2	115	35.4	<5.0	--	--	12.3	<10.0
MW-2	5/9/2013	(Dup)(NP)	266.69	23.41	0.0	243.28	**4,210**	**2,700**	420	**63.4**	8.5	124	47.7	<5.0	--	--	12.4	<10.0
MW-2	11/19/2013	(NP)	266.69	24.40	0.0	242.99	**1,400**	280	100(J)	**7.3**	4.4(J)	17	40	6.3	--	--	9.8	3.2
MW-2	11/19/2013	(Dup)(NP)	266.69	24.40	0.0	242.99	**1,700**	--	--	**8.8**	6.4	17	46	6.4	--	--	--	--
MW-2	5/13/2014	(NP)	266.69	23.74	0.0	242.95	**3,100**	**1,800**	**880**	**79**	3.3(J)	58	20	6.0	--	--	6.6(J)	<4.7
MW-2	5/7/2015	(NP)	266.69	24.14	0.0	242.55	**2,700**	**1,900**	**690**	**33**	6.1	91	32	2.4	--	--	**34.1**	<4.7
MW-2	5/7/2015	(Dup)(NP)	266.69	24.14	0.0	242.55	**2,100**	--	--	**27**	5.1	74	25	1.9(J)	--	--	--	--
MW-2	3/2/2016	(NP)	266.69	23.79	0.0	242.90	**5,100**	**1,600**	<100	**54**	5.3(J)	94	26	<5.0	--	--	--	--
MW-2	6/6/2016	(NP)	266.69	24.49	0.0	242.20	**5,000**	**880**	**790**	**43**	4.9	92	21	1.1(J)	--	--	--	--
MW-2	6/6/2016	(Dup)(NP)	266.69	24.49	0.0	242.20	**4,900**	**1,300**	**810**	**28**	5.3	94	26	<1.0	--	--	--	--
MW-2	9/12/2016	(NP)	266.69	26.69	0.0	240.00	**5,000**	**710**	**660**	**130**	6.5	83	20	2.2	--	--	--	--
MW-2	12/12/2016	(NP)	266.69	23.96	0.0	242.73	**1,000**	**590**	<110	4.1	0.74(J)	12	10	<0.50	--	--	--	--
MW-2	12/12/2016	(Dup)(NP)	266.69	23.96	0.0	242.73	**1,900**	400	**860**	0.80(J)	<0.50	6.7	1.9	<0.50	--	--	--	--
MW-3	6/7/1993		98.53	22.28	--	76.25	**2,200**	--	--	**140**	7	13	14	--	--	--	--	--
MW-3	3/4/1994		98.53	23.62	--	74.91	**1,200**	**590**	--	**99**	2	11	10	--	--	--	4	<3
MW-3	7/6/1994		98.53	23.84	--	74.69	**1,500**	270	--	**44**	6	26	27	--	--	--	--	--
MW-3	10/7/1994		98.53	24.21	--	74.32	**1,500**	--	--	**63**	4	16	13	--	--	--	--	--
MW-3	12/28/1994		98.53	23.91	--	74.62	**1,800**	--	--	**77**	3	13	9	--	--	--	--	--
MW-3	3/13/1995		98.53	23.12	--	75.41	**1,700**	--	--	**87**	4	18	10	--	--	--	--	--
MW-3	6/30/1995		98.53	23.87	--	74.66	**1,800**	--	--	**90**	3	52	13	--	--	--	--	--
MW-3	9/6/1995		98.53	23.14	--	75.39	**1,700**	--	--	**96**	3	41	14	--	--	--	--	--
MW-3	12/8/1995		98.53	23.20	--	75.33	**1,800**	--	--	**73**	4	23	15	--	--	--	--	--
MW-3	3/11/1996		98.53	21.63	--	76.90	**2,800**	--	--	**120**	11	170	36	--	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-3	6/18/1996		98.53	21.20	--	77.33	**3,500**	--	--	**150**	18	320	59	--	--	--	--	--
MW-3	9/9/1996		98.53	21.67	--	76.86	**3,500**	--	--	**62**	16	220	96	15	--	--	--	--
MW-3	12/11/1996		98.53	21.87	--	76.66	**2,100**	--	--	**96**	9	<0.5	34	<10	--	--	--	--
MW-3	3/13/1997		98.53	20.67	--	77.86	**3,100**	--	--	**97**	13	250	65	**<50**	--	--	--	--
MW-3	6/5/1997		98.53	19.83	--	78.70	**3,900**	--	--	**46**	19	250	130	**<100**	--	--	--	--
MW-3	9/5/1997		98.53	20.72	--	77.81	**4,400**	--	--	**98**	29	270	140	<5	--	--	--	--
MW-3	4/2/1998		98.53	19.63	--	78.90	**3,700**	--	--	**80**	25	320	150	**<50**	--	--	--	--
MW-3	6/8/1998		98.53	20.26	--	78.27	**3,500**	--	--	**60**	22	240	96	**<50**	--	--	--	--
MW-3	9/17/1998		98.53	21.21	--	77.32	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	12/9/1998		98.53	21.06	--	77.47	**3,200**	--	--	**63**	9	170	59	<5.0	--	--	--	--
MW-3	3/17/1999		98.53	18.72	--	79.81	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	6/26/1999		98.53	19.92	--	78.61	**3,100**	--	--	**72**	16	270	52	**56**	--	--	--	--
MW-3	9/28/1999		98.53	20.79	--	77.74	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	1/19/2000		98.53	20.19	--	78.34	**5,700**	--	--	**72**	29	430	110	<0.5	--	--	--	--
MW-3	3/24/2000		98.53	19.64	--	78.89	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	7/2/2000		98.53	20.53	--	78.00	**3,300**	--	--	**35**	18	230	64	7	--	--	--	--
MW-3	9/14/2000		98.53	21.34	--	77.19	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	12/14/2000		98.53	21.90	--	76.63	**5,500**	--	--	**40**	<10	210	<30	**<40**	--	--	--	--
MW-3	9/22/2001		98.53	22.82	--	75.71	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	12/9/2001		98.53	22.50	--	76.03	**4,200**	--	--	**42**	4.1	77	22	<4.0	--	--	--	--
MW-3	3/20/2002		98.53	21.55	--	76.98	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	6/11/2002		98.53	21.69	--	76.84	**8,400**	--	--	**77**	<5.0	320	54	<20	--	--	--	--
MW-3	12/21/2002		98.53	24.37	--	74.16	**3,440**	--	--	**37.7**	3.31	68.6	18.3	**39.3**	--	--	--	--
MW-3	3/19/2003	(NS)	98.53	23.17	--	75.36	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	6/18/2003		98.53	22.82	--	75.71	**4,020**	--	--	**39.1**	4.22	113	30.3	**62.6**	--	--	--	--
MW-3	9/23/2003	(NS)	98.53	23.55	--	74.98	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	10/21/2003		98.53	23.52	--	75.01	**3,190**	--	--	**19.8**	2.92	31.2	16.3	<1.00	--	--	--	--
MW-3	6/29/2004	(NS)	98.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	11/15/2004	(NP)	98.53	23.95	--	74.58	**3,170**	--	--	**15.8**	2.36	20.9	11.1	2.36	--	--	--	--
MW-3	4/14/2005	(NP)	98.53	23.90	--	74.63	**3,340**	--	--	**17.1**	5.21	14.3	11.2	<2.00	--	--	--	--
MW-3	12/18/2005	(NP)	98.53	24.42	--	74.11	**4,150**	--	--	**15.1**	2.92	20.7	15.1	<1.00	--	--	--	--
MW-3	6/11/2006	(NP)	98.53	23.48	--	75.05	**4,000**	--	--	**20.9**	3.6	30	21.3	1.11	--	--	--	--
MW-3	11/5/2006	(NP)	98.53	24.59	--	73.94	**4,970**	--	--	**16.8**	2.85	19	16.6	--	--	--	--	--
MW-3	9/25/2007	(NP)	98.53	23.84	--	74.69	**4,530**	--	--	**18.2**	2.34	17.1	13.8	--	--	--	--	--
MW-3	12/31/2007	(NP)	98.53	23.83	--	74.70	**4,490**	--	--	**16.5**	2.38	32.7	16.1	--	--	--	--	--
MW-3	5/29/2008	(NP)	98.53	23.90	--	74.63	**5,350**	--	--	**16.5**	1.83	14.4	15	--	--	--	--	--
MW-3	10/28/2008	(NP)	98.53	24.97	--	73.56	**3,250**	--	--	**14.4**	1.86	13.8	10.3	--	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-3	6/22/2009	(NP)	98.53	25.29	--	73.24	**2,000**	--	--	**15**	1.7	35	7.3	--	--	--	<2.00	<2.00
MW-3	12/15/2009	(NP)	98.53	25.14	--	73.39	**2,100**	--	--	**13**	1.5	28	7.3	--	--	--	7.7	<2.00
MW-3	5/24/2010	(NP)	266.00	24.10	--	241.90	**2,300**	--	--	**29**	6.2	28	19	--	--	--	--	--
MW-3	10/12/2010	(NP)	266.00	24.40	0.0	241.60	**2,380**	--	--	**31.1**	<1.0	16.6	4.7	<1.0	--	--	<10.0	--
MW-3	5/10/2011	(NP)	266.00	22.55	0.0	243.45	**3,280**	**820**	**840**	**33.6**	1.2	57.5	7.9	2.4	--	--	<10.0	--
MW-3	11/29/2011	(NP)	266.00	24.19	0.0	241.81	**3,130**	<76	<380	**30.4**	<1.0	21.0	6.9	--	--	--	<10.0	--
MW-3	6/1/2012	(NP)	266.00	22.94	0.0	243.06	**2,360**	**512**	446	**29.0**	<1.0	35.9	7.6	2.6	--	--	<10.0	<10.0
MW-3	11/29/2012	(NP)	266.00	22.90	0.0	243.10	**2,320**	**670**	500	3.2	1.9	40.7	10.6	1.8	--	--	4.1	<3.0
MW-3	5/9/2013	(NP)	266.00	22.72	0.0	243.28	**2,850**	**610**	<420	**32.8**	4.2	98.3	13.9	2.7	--	--	<10.0	<10.0
MW-3	11/19/2013	(NP)	266.00	24.30	0.0	241.70	380	**620**	340	3.5(J)	<0.70	3.4(J)	1.3(J)	0.68(J)	--	--	3.2	0.47(J)
MW-3	5/13/2014	(NP)	266.00	22.95	0.0	243.05	**1,100**	**710**	**700**	**8.4**	0.94(J)	17	3.7	1.1	--	--	<4.7	<4.7
MW-3	5/7/2015	(NP)	266.00	23.52	0.0	242.48	**1,800**	430	440	**9.9**	<0.50	10	2.1	1.2	--	--	<4.7	<4.7
MW-3	3/2/2016	(NP)	266.00	22.12	0.0	243.88	<50	<48	150(J)	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-3	6/6/2016	(NP)	266.00	23.76	0.0	242.24	500	110	180(J)	1.4	<0.50	0.78(J)	<0.50	<0.50	--	--	--	--
MW-3	9/12/2016	(NP)	266.00	25.08	0.0	240.92	**1,200**	100	<67	4.3	<0.50	2.1	<0.50	<0.50	--	--	--	--
MW-3	12/12/2016	(NP)	266.00	22.42	0.0	243.58	53(J)	210	140(J)	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-4	5/11/1993		100.26	23.03	--	77.23	**31,000**	--	--	**8,700**	**4,000**	57	**3,200**	--	--	--	--	--
MW-4	3/4/1994		100.26	26.83	4.00	76.63	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	7/6/1994		100.26	25.63	1.43	75.77	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	10/7/1994		100.26	26.07	1.63	75.49	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/28/1994		100.26	25.85	1.43	75.55	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/13/1995		100.26	25.59	1.88	76.17	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/30/1995		100.26	24.64	1.11	76.51	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	9/6/1995		100.26	24.78	1.05	76.32	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/8/1995		100.26	24.94	1.05	76.16	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/11/1996		100.26	24.68	2.38	77.48	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/18/1996		100.26	24.04	2.11	77.91	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	9/9/1996		100.26	24.08	1.85	77.66	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/11/1996		100.26	23.07	0.38	77.49	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/17/1999		100.26	--	--	--	**100,000**	--	--	**12,000**	**17,000**	**1,800**	**10,000**	**<50**	--	--	--	--
MW-4	9/28/1999		100.26	--	--	--	**97,000**	--	--	**27,000**	**65,000**	**18,000**	**100,000**	**<1,000**	--	--	--	--
MW-4	1/19/2000		100.26	--	--	--	**100,000**	--	--	**22,000**	**18,000**	**2,400**	**15,000**	<5	--	--	--	--
MW-4	3/24/2000		100.26	--	--	--	**100,000**	--	--	**13,000**	**18,000**	**2,200**	**13,000**	<5	--	--	--	--
MW-4	7/2/2000		100.26	--	--	--	**92,000**	--	--	**13,000**	**17,000**	**1,800**	**10,000**	**220**	--	--	--	--
MW-4	9/14/2000		100.26	--	--	--	**160,000**	--	--	**22,000**	**27,000**	**6,900**	**23,000**	<5	--	--	--	--
MW-4	9/14/2000	(Dup)	100.26	--	--	--	**160,000**	--	--	**16,000**	**22,000**	<500	**7,800**	**<2,000**	--	--	--	--
MW-4	9/22/2001		100.26	26.60	3.27	76.28	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-4	12/9/2001		100.26	25.50	2.37	76.66	**110,000**	--	--	**12,000**	**10,000**	**1,900**	**8,800**	**<40**	--	--	--	--
MW-4	3/20/2002		100.26	26.50	3.73	76.74	**100,000**	--	--	**13,000**	**19,000**	**2,500**	**13,000**	**360**	--	--	--	--
MW-4	6/11/2002		100.26	24.25	1.10	76.89	**95,000**	--	--	**13,000**	**17,000**	**2,300**	**12,000**	**<400**	--	--	--	--
MW-4	12/21/2002	(NS)	100.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/19/2003	(NS)	100.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/18/2003	(NS)	100.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	9/23/2003		100.26	22.31	0.07	78.01	**75,900**	--	--	**7,140**	**8,980**	**1,270**	**8,820**	**<50.0**	--	--	--	--
MW-4	10/21/2003		100.26	21.79	--	78.47	**44,700**	--	--	**3,190**	**6,370**	**779**	**6,160**	**<500**	--	--	--	--
MW-4	6/29/2004	(NP)	100.26	22.88	0.0	77.38	**378,000**	--	--	**11,200**	**16,300**	**3,550**	**22,600**	**2,500**	--	--	--	--
MW-4	11/15/2004	(NAPL)	100.26	23.07	1.45	78.35	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	4/14/2005	(NAPL)	100.26	23.82	1.89	77.95	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/18/2005	(NP)	100.26	23.43	0.08	76.89	**214,000**	--	--	**9,430**	**12,800**	**2,000**	**13,500**	**<100**	--	--	--	--
MW-4	6/11/2006	(NP)	100.26	21.87	0.01	78.40	**117,000**	--	--	**13,000**	**18,200**	**2,300**	**14,000**	**<1,000**	--	--	--	--
MW-4	11/5/2006	(NP)	100.26	22.92	0.01	77.35	**120,000**	--	--	**6,950**	**10,500**	**2,070**	**13,500**	--	--	--	--	--
MW-4	9/25/2007	(NAPL)	100.26	22.15	0.02	78.13	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/31/2007	(NS)	100.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/29/2008	(NM)	100.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	10/28/2008	(DRY)	100.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/22/2009	(NAPL)	100.26	24.21	0.04	76.08	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/15/2009	(NAPL)	100.26	24.04	0.28	76.44	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/24/2010	(NM)	267.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/10/2011	(NM)	267.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	11/29/2011	(NM)	267.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/1/2012	(NM)	267.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	11/29/2012	(NAPL)	267.78	24.00	0.10	243.86	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/9/2013	(NAPL)	267.78	26.48	3.83	244.36	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	11/19/2013	(NAPL)	267.78	26.61	1.81	242.62	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/13/2014	(NAPL)	267.78	25.80	2.50	243.98	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/7/2015	(NAPL)	267.78	26.50	2.95	243.64	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/2/2016	(NAPL)	267.78	24.67	1.40	244.23	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/6/2016	(NAPL)	267.78	25.86	1.53	243.14	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	9/12/2016	(NAPL)	267.78	26.51	1.11	242.16	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/12/2016	(NP)	267.78	23.27	0.0	244.51	**25,000**	**2,100**	380	**120**	37	57	1,000	<2.5	--	--	--	--
MW-5	5/11/1993		100.88	22.97	--	77.91	**1,800**	--	--	**130**	25	23	22	--	--	--	--	--
MW-5	3/4/1994		100.88	24.35	--	76.53	710	420	--	**26**	6	11	8	--	--	--	**27**	<3
MW-5	7/6/1994		100.88	24.72	--	76.16	400	<250	--	**11**	3	1	4	--	--	--	--	--
MW-5	10/7/1994		100.88	25.02	--	75.86	510	--	--	**13**	4	2	4	--	--	--	--	--

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Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-5	12/28/1994		100.88	24.98	--	75.90	**1,300**	--	--	**46**	13	20	22	--	--	--	--	--
MW-5	3/13/1995		100.88	24.41	--	76.47	**2,800**	--	--	**34**	8	40	28	--	--	--	--	--
MW-5	6/30/1995		100.88	24.06	--	76.82	**1,100**	--	--	**50**	11	12	15	--	--	--	--	--
MW-5	9/6/1995		100.88	24.27	--	76.61	**1,100**	--	--	**42**	14	30	18	--	--	--	--	--
MW-5	12/8/1995		100.88	24.49	--	76.39	**1,700**	--	--	**32**	7	42	62	--	--	--	--	--
MW-5	3/11/1996		100.88	23.33	--	77.55	**8,100**	--	--	**85**	9	210	140	--	--	--	--	--
MW-5	6/18/1996		100.88	22.91	--	77.97	**2,700**	--	--	**100**	17	88	25	--	--	--	--	--
MW-5	9/9/1996		100.88	23.07	--	77.81	**2,200**	--	--	**180**	29	100	27	<1.0	--	--	--	--
MW-5	12/11/1996		100.88	23.13	--	77.75	**4,900**	--	--	**110**	18	96	250	12	--	--	--	--
MW-5	3/13/1997		100.88	22.28	--	78.60	**5,500**	--	--	**190**	35	190	73	**<50**	--	--	--	--
MW-5	6/5/1997		100.88	21.78	--	79.10	**4,100**	--	--	**290**	42	200	37	**<100**	--	--	--	--
MW-5	9/5/1997		100.88	21.92	--	78.96	**3,100**	--	--	**420**	83	190	730	**<50**	--	--	--	--
MW-5	4/2/1998		100.88	21.35	--	79.53	**5,400**	--	--	**470**	89	340	83	**<50**	--	--	--	--
MW-5	6/8/1998		100.88	21.48	--	79.40	**4,200**	--	--	**360**	110	220	66	**71**	--	--	--	--
MW-5	9/17/1998		100.88	22.12	--	78.76	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/9/1998		100.88	22.33	--	78.55	**4,900**	--	--	**170**	41	120	120	<1.0	--	--	--	--
MW-5	3/17/1999		100.88	20.93	--	79.95	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	6/26/1999		100.88	21.02	--	79.86	**3,300**	--	--	**180**	82	210	24	8	--	--	--	--
MW-5	9/28/1999		100.88	21.76	--	79.12	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	1/19/2000		100.88	21.65	--	79.23	**6,500**	--	--	**480**	350	370	87	<0.5	--	--	--	--
MW-5	3/24/2000		100.88	21.48	--	79.40	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	7/2/2000		100.88	22.01	--	78.87	**6,100**	--	--	**390**	110	290	54	20	--	--	--	--
MW-5	9/14/2000		100.88	22.59	--	78.29	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/14/2000		100.88	22.95	--	77.93	**4,000**	--	--	**26**	<10	<10	<30	**<40**	--	--	--	--
MW-5	9/22/2001		100.88	23.86	--	77.02	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/9/2001		100.88	23.90	--	76.98	**12,000**	--	--	**51**	<10	120	140	<10	--	--	--	--
MW-5	3/20/2002		100.88	23.13	--	77.75	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	6/11/2002		100.88	23.09	--	77.79	**5,700**	--	--	**94**	21	110	24	<20	--	--	--	--
MW-5	12/21/2002		100.88	24.65	--	76.23	**1,300**	--	--	**6.32**	2.95	6.59	11.1	5.88	--	--	--	--
MW-5	3/19/2003		100.88	24.68	--	76.20	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	6/18/2003		100.88	24.37	--	76.51	**1,950**	--	--	**7.18**	1.95	12	24.7	6	--	--	--	--
MW-5	9/23/2003		100.88	24.88	--	76.00	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	10/21/2003		100.88	24.99	--	75.89	322	--	--	1.18	2.19	0.732	3.38	<1.00	--	--	--	--
MW-5	6/29/2004	(NP)	100.88	24.22	--	76.66	**1,180**	--	--	**5.4**	3.24	4.79	14.1	6.95	--	--	--	--
MW-5	11/15/2004	(NP)	100.88	24.97	--	75.91	399	--	--	0.74	<0.500	<0.500	<1.00	<2.00	--	--	--	--
MW-5	4/14/2005	(NP)	100.88	25.08	--	75.80	**2,900**	--	--	**14.3**	13.4	33.9	40	<2.00	--	--	--	--
MW-5	12/18/2005	(NP)	100.88	25.47	--	75.41	661	--	--	2.49	2.43	3.58	5.11	<1.00	--	--	--	--

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Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-5	6/11/2006	(NP)	100.88	24.43	--	76.45	**2,830**	--	--	**6.08**	1.05	2.78	3.1	<1.00	--	--	--	--
MW-5	11/5/2006	(NP)	100.88	25.55	--	75.33	723	--	--	1.41	0.78	1.29	<3.00	--	--	--	--	--
MW-5	9/25/2007	(NP)	100.88	24.95	--	75.93	712	--	--	1.86	0.53	0.77	<3.00	--	--	--	--	--
MW-5	12/31/2007	(NP)	100.88	25.16	--	75.72	**7,190**	--	--	**9.4**	11.3	38.1	75.7	--	--	--	--	--
MW-5	5/29/2008	(NP)	100.88	25.01	--	75.87	**2,740**	--	--	**7.47**	9.12	15.7	23.7	--	--	--	--	--
MW-5	10/28/2008	(NP)	100.88	25.89	--	74.99	516	--	--	2.01	1.46	<0.500	3.48	--	--	--	--	--
MW-5	6/22/2009	(NP)	100.88	26.95	--	73.93	**4,800**	--	--	**36**	24	87	49.9	--	--	--	**23**	--
MW-5	12/15/2009	(NP)	100.88	26.57	--	74.31	**2,300**	--	--	**24**	19	29	23	--	--	--	12	11
MW-5	5/24/2010	(NP)	100.88	25.55	--	75.33	**4,200**	--	--	**59**	8.4	96	41	--	--	--	--	--
MW-5	10/12/2010	(NP)	268.46	25.74	0.0	242.72	**2,320**	--	--	**31.4**	2.6	12.7	4.8	<1.0	--	--	<10.0	--
MW-5	10/12/2010	(Dup)(NP)	268.46	25.74	0.0	242.72	**2,260**	--	--	**31.6**	2.6	12.6	4.8	<1.0	--	--	--	--
MW-5	5/10/2011	(NP)	268.46	24.61	0.0	243.85	**4,710**	470	<400	**12.4**	4.1	39.3	25.5	<1.0	--	--	<10.0	--
MW-5	11/29/2011	(NP)	268.46	25.55	0.0	242.91	**2,210**	95	<380	**12.3**	2.2	6.4	3.1	--	--	--	10.5	--
MW-5	6/1/2012	(NP)	268.46	24.60	0.0	243.86	**1,620**	**1,040**	<392	**13.3**	3.0	9.6	10.7	<1.0	--	--	<10.0	<10.0
MW-5	6/1/2012	(Dup)(NP)	268.46	24.60	0.0	243.86	**1,520**	**1,030**	<388	**12.8**	2.8	8.8	10	<1.0	--	--	<10.0	<10.0
MW-5	11/29/2012	(NP)	268.46	25.31	0.0	243.15	**4,160**	**1,100**	<440	**18.0**	8.0	61.7	28.2	<1.0	--	--	**42.5**	<3.0
MW-5	5/9/2013	(NP)	268.46	24.52	0.0	243.94	**3,470**	<400	<400	**19.0**	6.7	48.3	18.5	<1.0	--	--	<10.0	<10.0
MW-5	11/19/2013	(NP)	268.46	26.35	0.0	242.11	**1,800**	240	**660**	**24**	5.7	17	6.3	<0.50	--	--	6.7	1.3
MW-5	5/13/2014	(NP)	268.46	25.18	0.0	243.28	**4,400**	440	370	**17**	7.5	69	23	<0.50	--	--	**16.2**	9.2(J)
MW-5	5/13/2014	(Dup)(NP)	268.46	25.18	0.0	243.28	**2,500**	--	--	**22**	2.5(J)	47	18	2.6(J)	--	--	--	--
MW-5	5/7/2015	(NP)	268.46	25.22	0.0	243.24	**2,800**	240	260	**11**	4.8	32	12	<0.50	--	--	**18.4**	5.2(J)
MW-5	3/2/2016	(NP)	268.46	25.55	0.0	242.91	**4,100**	320	**530**	4.5	2.8	24	13	<0.50	--	--	--	--
MW-5	6/6/2016	(NP)	268.46	25.74	0.0	242.72	**5,300**	310	**620**	**6.9**	4.4	23	15	<0.50	--	--	--	--
MW-5	9/12/2016	(NS, IW)	268.46	27.43	0.0	241.03	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/12/2016	(NP)	268.46	25.36	0.0	243.10	**4,300**	**17,000**	**<540**	1.7	1.8	9.0	4.5	<0.50	--	--	--	--
MW-6	9/5/1997		98.62	21.20	--	77.42	930	--	--	<0.5	19	6	15	**32**	--	--	--	--
MW-6	4/2/1998		98.62	19.70	--	78.92	600	--	--	<0.5	10	3	11	6	--	--	--	--
MW-6	6/8/1998		98.62	20.58	--	78.04	430	--	--	<0.5	6	2	5	10	--	--	--	--
MW-6	9/17/1998		98.62	21.87	--	76.75	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/9/1998		98.62	21.20	--	77.42	260	--	--	<1.0	<1.0	1	3	2	--	--	--	--
MW-6	3/17/1999		98.62	18.49	--	80.13	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	6/26/1999		98.62	18.49	--	80.13	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	9/28/1999		98.62	21.40	--	77.22	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	1/19/2000		98.62	20.39	--	78.23	330	--	--	<0.5	<0.5	6	10	7	--	--	--	--
MW-6	3/24/2000		98.62	19.63	--	78.99	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	9/14/2000		98.62	21.92	--	76.70	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/14/2000		98.62	22.51	--	76.11	1,000	--	--	**<10**	<10	<10	<30	**<40**	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-6	9/22/2001		98.62	23.31	--	75.31	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/9/2001		98.62	22.24	--	76.38	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/20/2002		98.62	21.44	--	77.18	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	6/11/2002		98.62	21.90	--	76.72	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/21/2002	(NS)	98.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/19/2003	(NS)	98.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	6/18/2003	(NS)	98.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	9/23/2003	(NS)	98.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	10/21/2003	(P)	98.62	22.69	--	75.93	254	--	--	**10**	3.66	0.898	5.03	<1.00	--	--	--	--
MW-6	6/29/2004	(NP)	98.62	22.88	--	75.74	540	--	--	**6.8**	1.73	<0.500	5.65	6.35	--	--	--	--
MW-6	11/15/2004	(NP)	98.62	24.12	--	74.50	370	--	--	**43.5**	14.5	0.58	10.4	<2.00	--	--	--	--
MW-6	4/14/2005	(NP)	98.62	23.75	--	74.87	443	--	--	**6.39**	0.95	<0.500	3.75	<2.00	--	--	--	--
MW-6	12/18/2005	(NP)	98.62	24.79	--	73.83	694	--	--	<0.500	<0.500	<0.500	3.01	<1.00	--	--	--	--
MW-6	6/11/2006	(NP)	98.62	23.09	--	75.53	601	--	--	<0.500	<0.500	<0.500	<3.00	<1.00	--	--	--	--
MW-6	11/5/2006	(NP)	98.62	25.80	--	72.82	444	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--
MW-6	9/25/2007	(NP)	98.62	24.13	--	74.49	321	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--
MW-6	12/31/2007	(NP)	98.62	23.59	--	75.03	168	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--
MW-6	5/29/2008	(NP)	98.62	24.21	--	74.41	**1,620**	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--
MW-6	10/28/2008	(NP)	98.62	25.47	--	73.15	481	--	--	<0.500	<0.500	<0.500	<3.00	--	--	--	--	--
MW-6	6/22/2009	(NP)	98.62	25.32	--	73.30	<50.0	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	<2.00	<2.00
MW-6	12/15/2009	(NP)	98.62	23.33	--	75.29	190	--	--	<1.00	<1.00	<1.00	<2.00	--	--	--	<2.00	<2.00
MW-6	5/24/2010	(NP)	266.06	22.90	--	243.16	280	--	--	**8.1**	<2.5	<2.5	<5.0	--	--	--	--	--
MW-6	10/12/2010	(NP)	266.06	23.06	0.0	243.00	<50.0	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	--
MW-6	5/10/2011	(NP)	266.06	22.01	0.0	244.05	96.0	180	<390	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	--
MW-6	11/29/2011	(NP)	266.06	23.42	0.0	242.64	<50.0	<78	<390	<1.0	<1.0	<1.0	<3.0	--	--	--	<10.0	--
MW-6	11/29/2011	(Dup)(NP)	266.06	23.42	0.0	242.64	<50.0	<77	<380	<1.0	<1.0	<1.0	<3.0	--	--	--	<10.0	--
MW-6	6/1/2012	(NP)	266.06	22.75	0.0	243.31	124	<76.9	<385	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-6	11/29/2012	(NM)	266.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	5/9/2013	(NP)	266.06	22.82	0.0	243.24	216	<400	<400	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-6	11/19/2013	(NP)	266.06	24.00	0.0	242.06	130(J)	31(J)	<71	<0.50	<0.70	<0.80	<0.80	<0.50	--	--	0.97(J)	0.12(J)
MW-6	5/13/2014	(NP)	266.06	22.76	0.0	243.30	120(J)	80(J)	180(J)	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	<4.7	<4.7
MW-6	5/7/2015	(NP)	266.06	23.71	0.0	242.35	<50	<28	<65	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	<4.7	<4.7
MW-6	6/6/2016	(NP)	266.06	23.82	0.0	242.24	<50	<46	<100	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-6	9/12/2016	(NP)	266.06	25.22	0.0	240.84	<50	140	280	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-6	12/12/2016	(NP)	266.06	22.66	0.0	243.40	<50	<47	<100	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-7	4/2/1998		97.32	18.79	--	78.53	**13,100**	--	--	<5	35	480	**1,100**	**<50**	--	--	--	--
MW-7	6/8/1998		97.32	19.60	--	77.72	**12,000**	--	--	<5.0	40	420	810	**63**	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-7	9/17/1998		97.32	20.82	--	76.50	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/9/1998		97.32	20.21	--	77.11	**9,600**	--	--	<5.0	26	360	610	11	--	--	--	--
MW-7	3/17/1999		97.32	17.61	--	79.71	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/26/1999		97.32	19.29	--	78.03	**8,300**	--	--	**11**	24	410	600	<5.0	--	--	--	--
MW-7	12/14/2000		97.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/9/2001		97.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/20/2002		97.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/11/2002		97.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/18/2003	(ABANDONED)	97.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	4/2/1998		98.49	19.99	--	78.50	<100	--	--	<0.5	1	<0.5	<1.5	<5	--	--	--	--
MW-8	6/8/1998		98.49	20.39	--	78.10	<100	--	--	<0.5	1	2	<1.5	<5.0	--	--	--	--
MW-8	9/17/1998		98.49	21.21	--	77.28	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/9/1998		98.49	21.03	--	77.46	<500	--	--	<5.0	<5.0	<5.0	<5.0	<5.0	--	--	--	--
MW-8	3/17/1999		98.49	19.03	--	79.46	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/26/1999		98.49	20.02	--	78.47	<500	--	--	<5.0	<5.0	<5.0	<5.0	<5.0	--	--	--	--
MW-8	12/14/2000		98.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/9/2001		98.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/20/2002		98.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/11/2002		98.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/18/2003	(ABANDONED)	98.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	10/12/2010	(NP)	263.35	23.89	0.0	239.46	<50.0	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	--
MW-9	5/10/2011	(NP)	263.35	20.70	0.0	242.65	<50.0	160	<420	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	--
MW-9	11/29/2011	(NP)	263.35	22.64	0.0	240.71	<50.0	<76	<380	<1.0	<1.0	<1.0	<3.0	--	--	--	<10.0	--
MW-9	6/1/2012	(NM)	263.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	11/29/2012	(NM)	263.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	5/9/2013	(NP)	263.35	21.09	0.0	240.55	<100	<400	<400	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-9	11/19/2013	(NP)	263.35	22.80	0.0	--	<50	49(J)	<75	<0.50	<0.70	<0.80	<0.80	<0.50	--	--	1.0	0.090(J)
MW-9	5/13/2014	(NP)	263.35	21.39	0.0	241.96	<50	<29	<67	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	<4.7	<4.7
MW-9	5/7/2015	(NP)	263.35	22.04	0.0	241.31	<50	28(J)	<65	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	<4.7	<4.7
MW-9	3/2/2016	(NS)	263.35	22.29	0.0	241.06	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	6/6/2016	(NS)	263.35	22.01	0.0	241.34	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	9/12/2016	(NP)	263.35	23.43	0.0	239.92	<50	190	170(J)	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
MW-10	6/1/2012	(NP)	268.30	24.20	0.0	244.10	<50.0	<76.9	<385	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0
MW-10	11/29/2012	(NP)	268.30	25.00	0.0	243.30	<100	<420	<420	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	**20.4**	<3.0
MW-10	11/29/2012	(Dup)(NP)	268.30	25.00	0.0	243.30	146	<470	<470	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	**22.6**	<3.0
MW-10	5/9/2013	(NP)	268.30	24.25	0.0	244.05	<100	<400	<400	<1.0	<1.0	<1.0	<3.0	<1.0	--	--	<10.0	<10.0

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
MW-10	11/19/2013	(NP)	268.30	25.80	0.0	242.50	66(J)	<34	<78	<0.50	<0.70	<0.80	<0.80	<0.50	--	--	12.8	<0.085
MW-10	5/13/2014	(NP)	268.30	24.78	0.0	243.52	<50	<28	<66	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	<4.7	<4.7
MW-10	5/7/2015	(NP)	268.30	24.84	0.0	243.46	150(J)	75(J)	150(J)	<0.50	<0.50	0.81(J)	7.1	<0.50	--	--	6.3(J)	<4.7
MW-10	9/12/2016	(NP)	268.30	26.52	0.0	241.78	130(J)	<29	<68	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	--	--
VE-1	4/2/1998		--	--	--	--	**60,500**	--	--	**3,900**	**2,300**	**820**	**4,500**	**<2,500**	--	--	--	--
VE-1	9/17/1998		--	--	--	--	**240,000**	--	--	**2,700**	**2,000**	**1,400**	**7,700**	**<100**	--	--	--	--
VE-1	12/9/1998		--	--	--	--	**73,000**	--	--	**2,200**	**1,400**	**770**	**3,700**	**<25**	--	--	--	--
VE-1	3/17/1999		--	--	--	--	**42,000**	--	--	**4,000**	**2,400**	**790**	**4,100**	**<25**	--	--	--	--
VE-1	6/26/1999		--	--	--	--	**42,000**	--	--	**3,800**	**2,600**	670	**3,500**	**<100**	--	--	--	--
VE-1	9/28/1999		--	--	--	--	**25,000**	--	--	**3,400**	**2,000**	630	**3,000**	**<25**	--	--	--	--
VE-1	3/24/2000		--	--	--	--	**31,000**	--	--	**3,200**	610	27	**3,600**	<5	--	--	--	--
VE-1	7/2/2000		--	--	--	--	**27,000**	--	--	**3,200**	**1,900**	620	**3,000**	**130**	--	--	--	--
VE-1	9/14/2000		--	--	--	--	**29,000**	--	--	**3,200**	**2,200**	**920**	**3,000**	<5	--	--	--	--
VE-1	12/14/2000		--	23.02	--	--	**28,000**	--	--	**2,400**	**1,300**	580	**2,600**	**<40**	--	--	--	--
VE-1	9/22/2001		--	24.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	12/9/2001		--	23.90	0.07	--	**24,000**	--	--	**1,300**	880	510	**2,400**	**<40**	--	--	--	--
VE-1	3/20/2002		--	23.30	0.05	--	**52,000**	--	--	**1,800**	**1,300**	560	**2,400**	**280**	--	--	--	--
VE-1	6/11/2002		--	23.25	0.11	--	**26,000**	--	--	**2,800**	**1,600**	650	**2,900**	**<80**	--	--	--	--
VE-1	12/21/2002	(P)	--	24.89	0.0	--	**25,900**	--	--	**1,630**	**1,150**	**741**	**3,660**	**<200**	--	--	--	--
VE-1	3/19/2003	(P)	--	24.71	0.0	--	**27,100**	--	--	**1,590**	**1,450**	**743**	**3,640**	**<250**	--	--	--	--
VE-1	6/18/2003	(P)	--	24.50	0.05	--	**37,000**	--	--	**2,190**	**1,710**	**929**	**5,230**	**79.8**	--	--	--	--
VE-1	9/23/2003	(P)	--	25.01	0.03	--	**28,300**	--	--	**1,620**	**1,270**	**704**	**3,500**	<20.0	--	--	--	--
VE-1	10/22/2003	(P)	--	24.98	0.17	--	**36,700**	--	--	**3,360**	**1,850**	**847**	**4,130**	**<50.0**	--	--	--	--
VE-1	6/29/2004	(NP)	--	25.12	0.0	--	**192,000**	--	--	**8,070**	**7,030**	**2,230**	**10,400**	**820**	--	--	--	--
VE-1	11/15/2004	(NP)	--	25.40	0.61	--	**99,900**	--	--	**5,680**	**6,280**	**3,430**	**17,600**	**<100**	--	--	--	--
VE-1	4/14/2005	(NP)	--	26.15	1.31	--	**39,600**	--	--	**3,120**	**3,300**	**1,210**	**5,560**	**<40.0**	--	--	--	--
VE-1	12/18/2005	(NP)	--	26.00	0.35	--	**142,000**	--	--	**6,140**	**5,850**	**1,400**	**6,750**	**<100**	--	--	--	--
VE-1	6/11/2006	(NP)	--	26.53	--	--	**68,300**	--	--	**7,200**	**8,100**	**3,900**	**25,100**	**<500**	--	--	--	--
VE-1	11/5/2006	(NP)	--	26.33	0.45	--	**60,500**	--	--	**3,780**	**4,320**	**1,190**	**6,390**	--	--	--	--	--
VE-1	9/25/2007	(NAPL)	--	25.02	0.14	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	12/31/2007	(NS)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	5/29/2008	(NAPL)	--	25.63	0.84	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	10/28/2008	(NAPL)	--	26.07	0.27	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	6/22/2009	(DRY)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	12/15/2009	(NAPL)	--	26.56	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	5/24/2010	(NS)	268.17	26.70	0.0	241.47	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	5/10/2011	(NM)	268.17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well	Date	Notes	TOC	DTW	NAPL	GWE	GRO	DRO	HO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	Total Lead	Dissolved Lead
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L							**800/1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**20**	**0.01**	**5**	**15**	**15**
VE-1	11/29/2012	(NAPL)	268.17	24.05	0.10	244.20	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	5/9/2013	(NS)	268.17	24.23	0.0	243.94	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	11/19/2013	(NAPL)	268.17	26.35	0.55	242.26	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	5/13/2014	(NAPL)	268.17	25.20	0.40	243.29	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	5/7/2015	(NAPL)	268.17	25.40	0.61	243.26	--	--	--	--	--	--	--	--	--	--	--	--
VE-1	3/2/2016	(NS)	268.17	24.99	0.0	243.18	--	--	--	--	--	--	--	--	--	--	--	--
VE-2	5/7/2015	(DRY)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-2	3/2/2016	(NS)	--	13.84	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-3	3/2/2016	(NS)	--	12.99	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-4	3/2/2016	(NS)	--	14.45	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--
VE-5	3/2/2016	(NS)	--	14.15	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--

TOC = Top of casing in feet North American Vertical Datum of 1988 (NAVD 88)
DTW = Depth to water in feet below TOC
NAPL = Non-aqueous phase liquid thickness in feet
GWE = Groundwater elevation in feet NAVD 88
GRO = Total petroleum hydrocarbons - gasoline range organics
DRO = Total petroleum hydrocarbons - diesel range organics
HO = Total petroleum hydrocarbons - heavy oil range organics
MTBE = Methyl tertiary butyl ether
EDB = Ethylene dibromide
EDC = 1,2-Dichloroethane
800/1,000 = GRO MTCA Method A CUL with benzene present is 800 µg/L and without is 1,000 µg/L
NS = Not sampled
-- = Not analyzed/not applicable
IW = Insufficient volume of water in the well to collect representative sample
NP = No purge sample
< = Analytical result is less than reporting limit shown
NM = Not measured
P = Purge sample
DUP = Duplicate sample
J = estimated value – The result is greater than or equal to the Method Detection Limit (MDL) and less than the Limit of Quantitation (LOQ)
Wells were resurveyed in 2010 and are referenced to vertical datum NAVD 88 and horizontal datum NAD 83/98
If NAPL is present, the GWE is corrected according to the following formula (TOC elevation - depth to water) + (0.8 x NAPL thickness)
Data collected prior to 2010 have been provided by previous consultants and are included as historical reference only
GRO, DRO, HO analyzed by Ecology Northwest Methods; Benzene, toluene, ethylbenzene, and total xylenes (BTEX), MTBE, and EDB by 8260B; Lead by U.S. Environmental Protection Agency (EPA) 6000/7000 Series; EDC by EPA 8011

Table 1
Groundwater Gauging Data and Select Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

BOLD constituent detected above MTCA Cleanup Levels

Table 2
Polycyclic Aromatic Hydrocarbons Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well ID	Date	Notes	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Total Naphthalenes	Total cPAHs
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			--	--	--	--	--	--	--	--	--	--	**160**	**0.1**
GMW-1	5/7/2015	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	1.8	4.0	7.4	13.2	ND < 0.00755
GMW-1	3/2/2016	(NP)	0.043 J	0.029 J	0.022 J	0.031 J	0.071	0.061	0.032 J	0.079	0.17	ND < 0.030	0.264	0.04861
GMW-1	6/6/2016	(NP)	--	--	--	--	--	--	--	0.53	1.1	2.2	3.83	--
GMW-1	9/12/2016	(NP)	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	1.4	2.8	6.8	11	ND < 0.00717
GMW-1	9/12/2016	(NP), (DUP)	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	1.4	2.8	7.1	11.3	ND < 0.00717
MW-1	5/7/2015	(NP)	0.025 J	0.026 J	0.044 J	0.020 J	0.032 J	0.018 J	0.033 J	0.023 J	0.026 J	ND < 0.031	0.065	0.04032
MW-1	3/2/2016	(NP)	ND < 0.011	ND < 0.011	ND < 0.011	ND < 0.011	ND < 0.011	ND < 0.011	ND < 0.011	0.12	0.20	0.40	0.72	ND < 0.008305
MW-1	6/6/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	9/12/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	5/7/2015	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	1.1	0.35	4.3	5.75	ND < 0.00755
MW-2	3/2/2016	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	1.7	0.34	4.3	6.34	ND < 0.00755
MW-2	6/6/2016	(NP)	--	--	--	--	--	--	--	2.5	0.29	4.6	7.39	--
MW-2	6/6/2016	(NP), (DUP)	--	--	--	--	--	--	--	1.9	0.17	4.5	6.57	--
MW-2	9/12/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	5/7/2015	(NP)	0.016 J	0.015 J	0.025 J	ND < 0.010	0.018 J	ND < 0.010	0.016 J	0.76	0.041	ND < 0.030	0.816	0.02188
MW-3	3/2/2016	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.030	ND < 0.025	ND < 0.00755
MW-3	6/6/2016	(NP)	--	--	--	--	--	--	--	0.032 J	ND <0.010	ND <0.031	0.05	--
MW-3	9/12/2016	(NP)	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	0.19	ND < 0.0095	ND < 0.029	0.20925	ND < 0.00717
MW-5	5/7/2015	(NP)	ND < 0.010	ND < 0.010	0.014 J	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	3.0	2.5	11	16.5	0.00845
MW-5	3/2/2016	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	2.7	2.8	9.9	15.4	ND < 0.00755
MW-5	6/6/2016	(NP)	--	--	--	--	--	--	--	2.3	2.3	7.3	11.9	--
MW-5	9/12/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	5/7/2015	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	0.011 J	0.012 J	ND < 0.030	0.038	ND < 0.00755
MW-6	3/2/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	6/6/2016	(NP)	--	--	--	--	--	--	--	ND <0.010	ND <0.010	ND <0.031	ND < 0.026	--
MW-6	9/12/2016	(NP)	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.028	ND < 0.0235	ND < 0.00717
MW-9	5/7/2015	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	0.015 J	ND < 0.031	0.036	ND < 0.00755
MW-9	3/2/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	6/6/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	9/12/2016	(NP)	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.028	ND < 0.0235	ND < 0.00717
MW-10	5/7/2015	(NP)	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	ND < 0.010	0.23	0.35	0.77	1.35	ND < 0.00755
MW-10	3/2/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	6/6/2016	(NS)	--	--	--	--	--	--	--	--	--	--	--	--

Table 2
Polycyclic Aromatic Hydrocarbons Analytical Results
WA-11060

4580 Fauntleroy Way Sw, Seattle, WA 98126

All analytical results are presented in micrograms per liter (µg/L)

Well ID	Date	Notes	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Total Naphthalenes	Total cPAHs
Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs) in µg/L			--	--	--	--	--	--	--	--	--	--	**160**	**0.1**
MW-10	9/12/2016	(NP)	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.0095	ND < 0.029	ND < 0.024	ND < 0.00717

Notes:
-- = Not analyzed/not applicable
NP = No purge sample
ND < = Analytical result is less than reporting limit shown
NS = Not sampled for polycyclic aromatic hydrocarbons (PAHs)
DUP = Duplicate sample
J = estimated value – The result is greater than or equal to the Method Detection Limit (MDL) and less than the Limit of Quantitation (LOQ)
Carcinogenic PAHs (cPAHs) and Naphthalenes analyzed by U.S. Environmental Protection Agency (EPA) 8270C SIM
cPAHs adjusted for toxicity according to Washington State Administrative Code 173-340-708(8). If one or more adjusted cPAH constituents were reported as non-detect, half of the reporting limit was used in calculations.
Naphthalenes is a sum total of 1-methyl-naphthalene, 2-methyl-naphthalene, and naphthalene. If one or more constituents were reported as non-detect, half of the reporting limit was used in calculations.
BOLD concentration greater than the MTCA Method A cleanup level

Table 3
Air Sparge and Soil Vapor Extraction - Operational Data
WA-11060

4580 Fauntleroy Way SW, Seattle, WA 98126

Date	SVE Operation (on or off) Arrival / Departure	SVE Hour Meter (Hours)	SVE Period Operation (Hours)	SVE Percent Uptime (%)	AS Operation (on or off) Arrival / Departure	AS Hour Meter (Hours)	AS Period Operation (Hours)	AS Percent Uptime (%)	Cat Ox Inlet Temperature (°F)	Post-Dilution[1]						Effluent PID (ppmv)	Destruction Efficiency (%)	VOC Mass Removal Rate (lbs/day)	VOC Mass Removal Rate (lbs/period)	Cumulative VOC Removal (lbs)
										Presure (in. Wc)	Influent Temperature (°F)	Influent Flowrate (fpm)	Influent Flowrate (acfm)	Influent Flowrate (scfm)	Influent PID (ppmv)				
Permit Requirements		--	--	--		--	--	--	**> 625**	--	--		--	**<120**	--	**<200**	**>98% [2]**			
04/20/16	off / on	6021.5	--	--	off / off	37.8	--	--	633.0	3.0	83.0	1080.0	36.8	35.5	316.0	0.9	99.7%	3.61	--	--
04/22/16	on / on	6064.0	42.5	88.5%	off / off	37.8	0.0	0.0%	649.0	2.0	89.0	1110.0	37.9	36.0	283.7	2.1	99.3%	3.29	5.83	5.83
04/27/16	on / on	6189.6	125.6	100.0%	off / off	37.8	0.0	0.0%	626.0	3.0	88.0	840.0	28.6	27.4	367.5	6.0	98.4%	3.24	16.96	22.78
05/04/16	on / on	6354.2	164.6	100.0%	off / off	37.8	0.0	0.0%	626.0	3.0	91.0	920.0	31.4	29.8	245.5	1.4	99.4%	2.36	16.17	38.95
05/10/16	on / on	6496.4	142.2	100.0%	off / off	37.8	0.0	0.0%	647.6	3.0	99.0	760.0	25.9	24.3	211.0	1.5	99.3%	1.65	9.78	48.73
06/13/16	off / on	7131.0	634.6	77.8%	off / off	37.8	0.0	0.0%	649.4	2.0	90.0	897.0	30.6	29.1	586.0	2.5	99.6%	5.48	177.48	226.21
7/12/16[3]	on / on	--	--	--	off / off	--	--	--	--	--	--	--	--	--	--	0.0	--	--	--	--
08/24/16	on / on	7492.0	361.0	20.9%	off / off	37.8	0.0	0.0%	644.0	5.0	86.5	1650.0	56.3	54.2	288.9	0.4	99.9%	5.04	75.83	302.03
09/20/16	on / on	8141.5	649.5	100.2%	off / off	37.8	0.0	0.0%	662.0	4.0	84.0	1029.0	35.1	33.9	398.0	1.1	99.7%	4.34	117.46	419.50
10/27/16	off / on	8721.0	579.5	65.3%	off / off	37.8	0.0	0.0%	662.0	1.0	75.0	120.0	4.1	4.0	135.0	0.0	100.0%	0.17	4.18	423.68
11/16/16	off / on	8831.1	110.1	22.9%	off / off	37.8	0.0	0.0%	719.6	1.0	59.0	290.0	9.9	9.9	451.8	5.2	98.8%	1.44	6.63	430.31
12/15/16	off / on	8989.1	158.0	22.7%	off / off	37.8	0.0	0.0%	645.8	0.5	65.0	280.0	9.5	9.5	388.0	6.4	98.4%	1.18	7.79	438.10

2016 Annual Operational Hours	**2,968**
2016 Average Uptime Percentage	**51.74%**
2016 Average SVE flow rate (scfm):	**26.7**

SVE = Soil Vapor Extraction
Air Sparge and Soil Vapor Extraction = Ambient air is pressurized and pumped into the subsurface to volatilize constituents for extraction by the SVE System. Vapor is extracted by vacuum and is treated by combustion before discharging to the atmosphere.
AS - Air Sparge
PSCAA Permit = Puget Sound Clean Air Agency (PSCAA) emission discharge permit #29642
< = Operation data must be less than the permit requirement
> = Operation data must be greater than the permit requirement
Period = Length of time since the previous date that operational data was collected
% = Percentage
Uptime = Calculated percentage of operation during the period. (Hours of operation per period / total hours per period)
Cat Ox = Catalytic Oxidizer, the system component that catalyzes combustion of extracted Volatile Organic Compounds (VOCs)
°F = Fahrenheit
in Wc = Inches of water column
fpm = feet per minute
acfm = Actual cubic feet per minute measured by anemometer
scfm = Standard cubic feet per minute. scfm = acfm * (Pactual / Pstandard) * (Tstandard / Tactual)

$$scfm = acfm \cdot \frac{(14.7\ [psi] + (influent\ pressure\ \cdot\ 0.0361\ [\frac{psi}{in.WC}]\ )}{14.7\ [psi]} \frac{68\ °\mathrm{F} + 460\ °R}{(460°R + influent\ temperature\ °\mathrm{F})}$$

Pstandard = Standard pressure = 1 atmosphere (14.7 pounds per square inch [psi])
Tstandard = Standard temperature = 68 °F, as used by the National Institute of Standards and Technology (NIST)
Pactual = Influent vacuum. Units converted in the formula from in.Hg to psi.
Tactual = Influent temperature. Units converted in the formula from °F to ° R (degrees Rankine)
PID = Photoionization Detector
ppmv = Parts per million volume

Table 3
Air Sparge and Soil Vapor Extraction - Operational Data
WA-11060

4580 Fauntleroy Way SW, Seattle, WA 98126

Date	SVE Operation (on or off) Arrival / Departure	SVE Hour Meter (Hours)	SVE Period Operation (Hours)	SVE Percent Uptime (%)	AS Operation (on or off) Arrival / Departure	AS Hour Meter (Hours)	AS Period Operation (Hours)	AS Percent Uptime (%)	Cat Ox Inlet Temperature (°F)	Post-Dilution[1]						Effluent PID (ppmv)	Destruction Efficiency (%)	VOC Mass Removal Rate (lbs/day)	VOC Mass Removal Rate (lbs/period)	Cumulative VOC Removal (lbs)
										Presure (in. Wc)	Influent Temperature (°F)	Influent Flowrate (fpm)	Influent Flowrate (acfm)	Influent Flowrate (scfm)	Influent PID (ppmv)					
Permit Requirements		--	--	--		--	--	--	> 625	--	--		--	<120	--	<200	>98% [2]			

Destruction Efficiency = (influent VOCs - effluent VOCs) / (influent VOCs). VOCs measured by PID

Mass Removal Rate= Flowrate * time * Concentration * Molecular Weight * Molar Density of Air

VOC molecular weight = 86 lb / [lb mol]

Molar density of air = P/RT = 1 atm / (0.7302 [ft^3 * atm] / [lb mol * ºR]) / (68 + 459.67)ºR = 0.00260 lb mol / ft^3

Molar density of air based on standard pressure of 1 atm and standard temperature of 68ºF, as used by the National Institute of Standards and Technology (NIST).

P = pressure

R = gas constant

ºR = degrees Rankine

T = temperature

atm = atmosphere

lb mol = Pound per Mole

ft^3 = cubic feet

$$Mass\ Removal\ Rate = (flowrate\ [scfm] * 60\ [min] x\ 24\ [hr]) x\ (VOCs\ [ppmv] * 10^6 x\ 86\ \left[\frac{lbs}{mol}\right] x\ .0026\ [\frac{lbmol}{ft^3}])$$

lbs = Pounds

lbs/day = Pounds per day

lbs/period = Pounds per period

Cumulative mass removed = Previous mass removed + Removal rate * Elapsed time

-- = Not collected/ not available

1 = Influent sample port is located post-dilution thus flow rate through cat ox is equal to exhaust flowrate and compliant with Puget Sound Clean Air Agency (PSCAA) permit #29664 subpart 7b.

2= Destruction Efficiency must be >97% when TPH influent is greater than 200 ppmv per PSCAA permit # 29664 subpart 5.

3=System shut down on 7/13/16 before O&M measurements were collected for the month. System restarted on 8/19/19. Effluent PID collected on 7/12/16 on system visit.

Table 4
Air Sparge and Soil Vapor Extraction - Analytical Data
WA-11060

4580 Fauntleroy Way SW, Seattle, WA 98126

Date	Influent Flowrate (scfm) [1]	Laboratory Analytical Influent Concentrations					Laboratory Analytical Effluent Concentrations					GRO Mass Removal		
		GRO (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	GRO (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Xylenes (ppmv)	Mass Removal Rate (lbs/day)	Mass Removal Rate (lbs/period)	Cumulative Mass Removal (lbs)
Permit Requirements	**<350**	**--**	**--**	**--**	**--**	**--**	**<200**	**<200**	**<200**	**<200**	**<200**	**--**	**--**	**--**
04/20/16	36	760	0.82 J	0.93 J	0.68 J	1.8 J	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	8.7	5.6	5.6
04/22/16	36	--	--	--	--	--	--	--	--	--	--	--	--	--
04/27/16	27	--	--	--	--	--	--	--	--	--	--	--	--	--
05/04/16	30	--	--	--	--	--	--	--	--	--	--	--	--	--
05/10/16	24	590.0	< 0.5	< 0.8	< 0.4	< 0.7	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	4.6	92.3	97.8
06/13/16	29	1,100	0.93 J	< 0.8	1.0	2.1	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	10.3	350.0	447.8
08/25/16	54	560	< 0.5	< 0.8	0.77 J	1.60 J	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	9.8	713.3	1161.1
09/20/16	34	670	< 0.5	< 0.8	< 0.4	0.88 J	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	7.3	190.0	1351.1
10/27/16	4	280	< 0.5	< 0.8	0.54 J	1.80 J	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	0.4	13.3	1364.4
11/16/16	10	1,500	< 0.5	< 0.8	2.6	3.3	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	4.8	95.9	1460.3
12/15/16	9	1,400	< 0.5	< 0.8	2.3	< 0.7	< 5.0	< 0.5	< 0.8	< 0.4	< 0.7	4.3	123.8	1584.1

SVE = Soil Vapor Extraction

Air Sparge and Soil Vapor Extraction = Ambient air is pressurized and pumped into the subsurface to volatilize constituents for extraction by the SVE System. Vapor is extracted by vacuum and is treated by combustion before discharging to the atmosphere.

AS - Air Sparge

PSCAA Permit = Puget Sound Clean Air Agency (PSCAA) emission discharge permit #29642

< = Operation data must be less than the permit requirement

> = Operation data must be greater than the permit requirement

scfm = Standard cubic feet per minute. scfm = acfm * (Pactual / Pstandard) * (Tstandard / Tactual)

Pstandard = Standard pressure = 1 atmosphere (14.7 pounds per square inch [psi])

Tstandard = Standard temperature = 68 ^{o}F, as used by the National Institute of Standards and Technology (NIST)

Pactual = Influent vacuum. Units converted in the formula from in.Hg to psi.

Tactual = Influent temperature. Units converted in the formula from ^{o}F to ^{o}R (degrees Rankine)

GRO = Total petroleum hydrocarbons - gasoline range organics GRO (C-4-C10 hydrocarbons hexane) by EPA method 25 modified

EPA = Environmetal Protection Agency

ppmv = Parts per million volume

Benzene, Toluene, Ethylbenzene and Xylenes by EPA method 18 modified

Mass Removal Rate= Flowrate * time * Concentration * Molecular Weight * Molar Density of Air

VOC molecular weight = 86 lb / [lb mol]

Molar density of air = P/RT = 1 atm / (0.7302 [ft^3 * atm] / [lb mol * ºR]) / (68 + 459.67)ºR = 0.00260 lb mol / ft^3

Molar density of air based on standard pressure of 1 atm and standard temperature of 68ºF, as used by the National Institute of Standards and Technology (NIST).

P = pressure

R = gas constant

ºR = degrees Rankine

T = temperature

atm = atmosphere

lb mol = Pound per Mole

ft^3 = cubic feet

$$Mass\ Removal\ Rate = (flowrate\ [scfm] * 60\ [min] x\ 24\ [hr]) x\ (VOCs\ [ppmv] * 10^6 x\ 86\ \left[\frac{lbs}{mol}\right] x\ .0026\ [\frac{lbmol}{ft^3}])$$

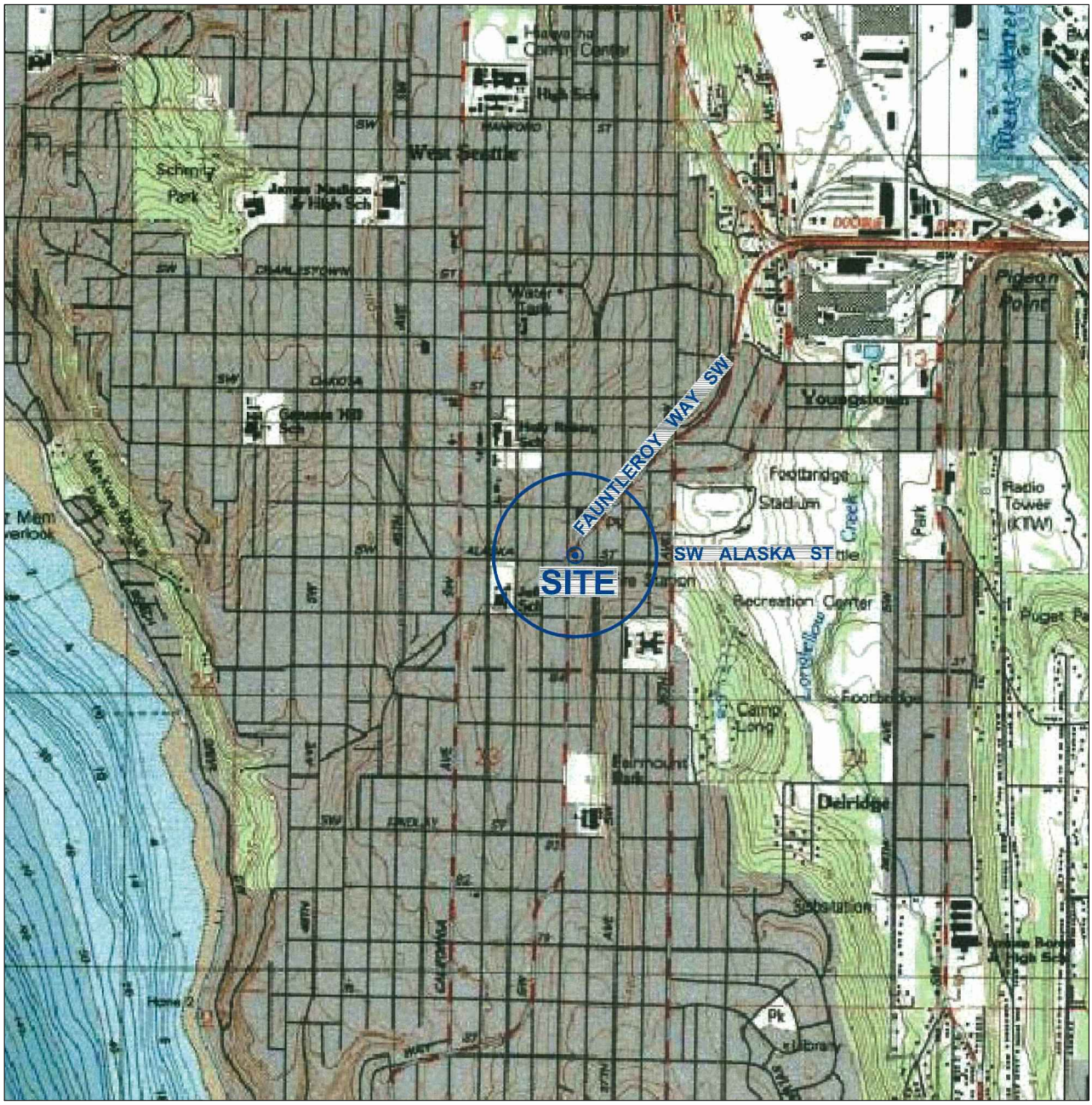
Table 4
Air Sparge and Soil Vapor Extraction - Analytical Data
WA-11060

4580 Fauntleroy Way SW, Seattle, WA 98126

Date	Influent Flowrate (scfm) [1]	Laboratory Analytical Influent Concentrations					Laboratory Analytical Effluent Concentrations					GRO Mass Removal		
		GRO (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	GRO (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Xylenes (ppmv)	Mass Removal Rate (lbs/day)	Mass Removal Rate (lbs/period)	Cumulative Mass Removal (lbs)
Permit Requirements	**<350**	**--**	**--**	**--**	**--**	**--**	**<200**	**<200**	**<200**	**<200**	**<200**	**--**	**--**	**--**

lbs = Pounds
lbs/day = pounds per day
Period = Length of time since the previous date that operational data was collected
lbs/period = Pounds per period
Cumulative mass removed = Previous mass removed + Removal rate * Elapsed time per period
J = estimated value – The result is greater than or equal to the Method Detection Limit (MDL) and less than the Limit of Quantitation (LOQ)
-- = Not collected/ not available
< = Analytical sample results below laboratory method detection limits
1 = Influent sample port is located post-dilution thus flow rate through cat ox is equal to exhaust flowrate and compliant with Puget Sound Clean Air Agency (PSCAA) permit #29664 subpart 7c

FIGURES



REFERENCE: BASE MAP USGS 7.5X15. MIN. TOPO. QUAD.,SEATTLE SOUTH, WA, 1983.

0 2000' 4000'

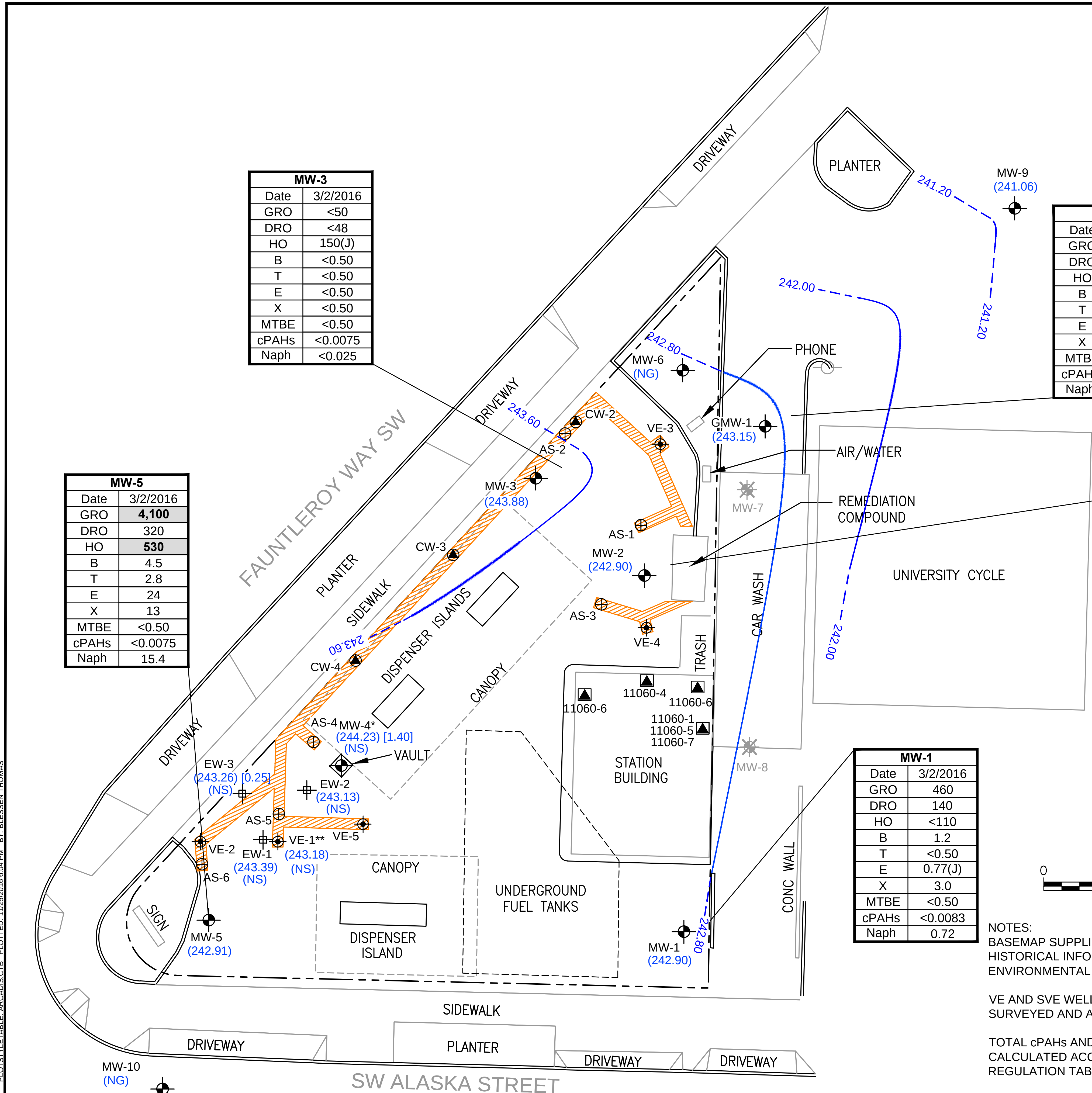
Approximate Scale: 1 in. = 2000 ft.

BP WEST COAST PRODUCTS LLC
FORMER BP STATION NO. 11060
4580 FAUNTLEROY WAY, SEATTLE, WASHINGTON
2016 ANNUAL SITE STATUS REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1



MW-3	
Date	3/2/2016
GRO	<50
DRO	<48
HO	150(J)
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
cPAHs	<0.0075
Naph	<0.025

MW-5	
Date	3/2/2016
GRO	**4,100**
DRO	320
HO	**530**
B	4.5
T	2.8
E	24
X	13
MTBE	<0.50
cPAHs	<0.0075
Naph	15.4

GMW-1	
Date	3/2/2016
GRO	**1,400**
DRO	<46
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
cPAHs	0.0486
Naph	0.264

MW-2	
Date	3/2/2016
GRO	**5,100**
DRO	**1,600**
HO	<100
B	**54**
T	5.3(J)
E	94
X	26
MTBE	<5.0
cPAHs	<0.0075
Naph	6.34

MW-1	
Date	3/2/2016
GRO	460
DRO	140
HO	<110
B	1.2
T	<0.50
E	0.77(J)
X	3.0
MTBE	<0.50
cPAHs	<0.0083
Naph	0.72

LEGEND

— — — —	APPROXIMATE PROPERTY LINE
CW-2	AS AND SVE COMBINATION WELL LOCATION
MW-2	MONITORING WELL LOCATION
MW-7	ABANDONED MONITORING WELL LOCATION
VE	VAPOR EXTRACTION WELL LOCATION (APPROXIMATE)
AS	AIR SPARGING WELL LOCATION (APPROXIMATE)
11060-1	PASSIVE VAPOR MONITORING LOCATION
EW-1	EXTRACTION WELL
	TRENCH LOCATION (APPROXIMATE)
243.60	GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED (FEET ABOVE NAVD 88)
(244.23)	GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
NAVD 88	NORTH AMERICAN VERTICAL DATUM 1988
<0.50	NOT DETECTED, VALUE SHOWN IS THE DETECTION LIMIT
(NS)	NOT SAMPLED
(NG)	NOT GAUGED
µg/L	MICROGRAMS PER LITER
*	WELL NOT USED FOR CONTOURING DUE TO INADEQUATE SURVEY
**	REMEDIATION WELL NOT USED FOR CONTOURING.
J	ESTIMATED VALUE, THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT AND LESS THEN THE LIMIT OF QUANTITATION.
[1.40]	NAPL THICKNESS (FEET)
NAPL	NON - AQUEOUS PHASE LIQUID
BOLD	CONSTITUENT DETECTED ABOVE MODEL TOXICS CONTROL ACT (MTCA) METHOD A CLEANUP LEVELS

SAMPLE ID	
Date	Sample Date
GRO	Total Petroleum Hydrocarbons (TPH) - Gasoline Range Organics (µg/L)
DRO	TPH - Diesel Range Organics (µg/L)
HO	TPH - Heavy Oil Range Organics (µg/L)
B	Benzene (µg/L)
T	Toluene (µg/L)
E	Ethylbenzene (µg/L)
X	Total Xylenes (µg/L)
MTBE	Methyl Tertiary Butyl Ether (µg/L)
cPAHs	Total Carcinogenic Polycyclic Aromatic Hydrocarbons (µg/L)
Naph	Total Naphthalenes (µg/L)

NOTES:
BASEMAP SUPPLIED BY OTAK, INC., IN 2010.
HISTORICAL INFORMATION SUPPLIED BY DELTA ENVIRONMENTAL CONSULTANTS, INC.

VE AND SVE WELL LOCATIONS HAVE NOT BEN SURVEYED AND ARE APPROXIMATE (EXCEPT FOR VE-1).

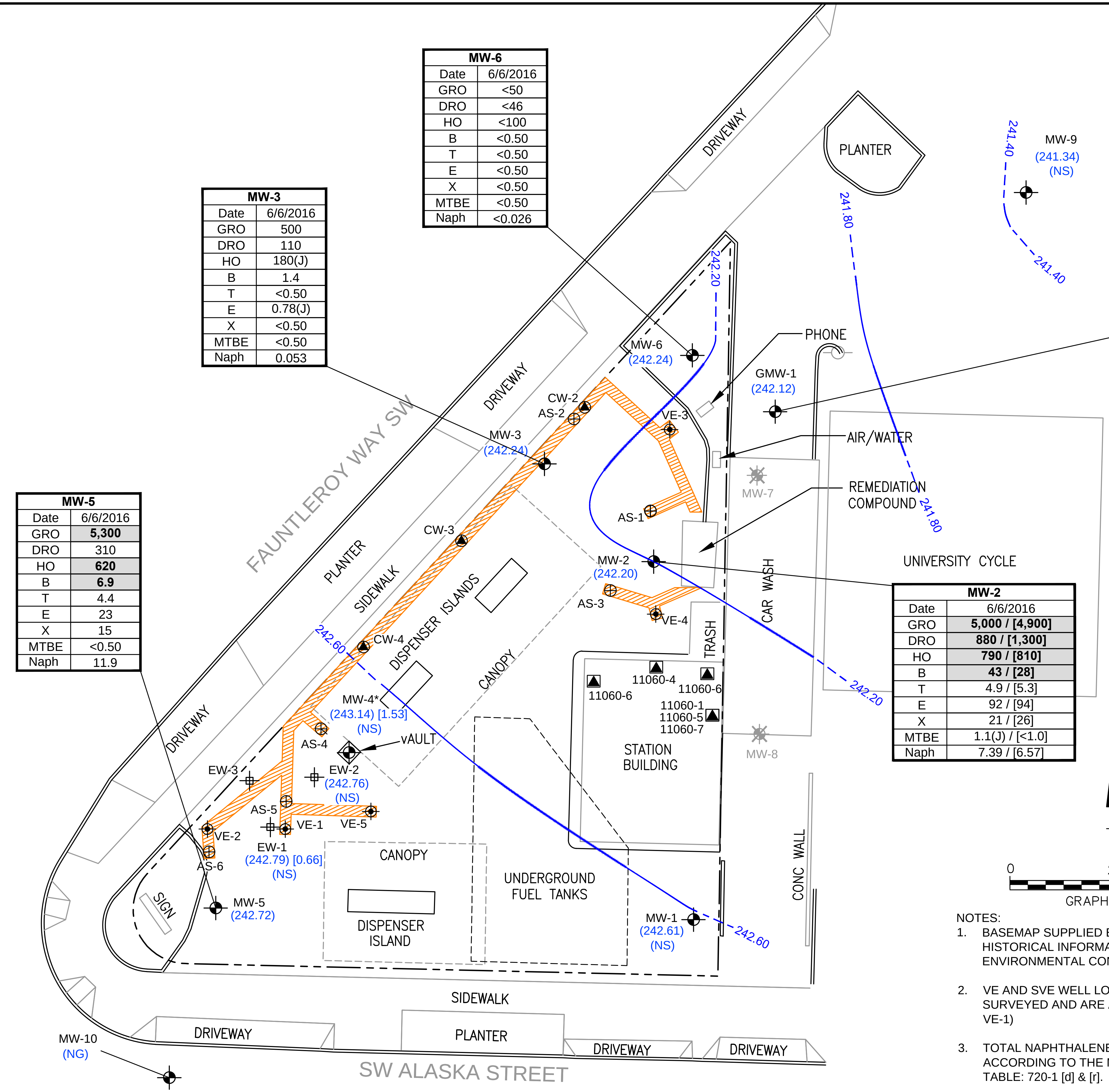
TOTAL cPAHs AND TOTAL NAPHTHALENES ARE CALCULATED ACCORDING TO THE MTCA CLEANUP REGULATION TABLE: 720-1 [d] & [r]

BP WEST COAST PRODUCTS LLC
FORMER BP STATION NO. 11060
4580 FAUNTLEROY WAY, SEATTLE, WASHINGTON
2016 ANNUAL SITE STATUS REPORT

GROUNDWATER ELEVATION CONTOUR MAP WITH ANALYTICAL RESULTS MARCH 2, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2



MW-6	
Date	6/6/2016
GRO	<50
DRO	<46
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
Naph	<0.026

MW-3	
Date	6/6/2016
GRO	500
DRO	110
HO	180(J)
B	1.4
T	<0.50
E	0.78(J)
X	<0.50
MTBE	<0.50
Naph	0.053

MW-5	
Date	6/6/2016
GRO	**5,300**
DRO	310
HO	**620**
B	**6.9**
T	4.4
E	23
X	15
MTBE	<0.50
Naph	11.9

GMW-1	
Date	6/6/2016
GRO	**3,300**
DRO	130
HO	<100
B	<0.50
T	<0.50
E	5.3
X	4.0
MTBE	<0.50
Naph	3.83

MW-2	
Date	6/6/2016
GRO	**5,000 / [4,900]**
DRO	**880 / [1,300]**
HO	**790 / [810]**
B	**43 / [28]**
T	4.9 / [5.3]
E	92 / [94]
X	21 / [26]
MTBE	1.1(J) / [<1.0]
Naph	7.39 / [6.57]

LEGEND

— — —	APPROXIMATE PROPERTY LINE
CW-2	AS AND SVE COMBINATION WELL LOCATION
MW-2	MONITORING WELL LOCATION
MW-7	ABANDONED MONITORING WELL LOCATION
VE	VAPOR EXTRACTION WELL LOCATION (APPROXIMATE)
AS	AIR SPARGE WELL LOCATION (APPROXIMATE)
11060-1	PASSIVE VAPOR MONITORING LOCATION
EW-1	EXTRACTION WELL
	TRENCH LOCATION (APPROXIMATE)
242.60	GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED (FEET ABOVE NAVD 88)
(242.79)	GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
NAVD 88	NORTH AMERICAN VERTICAL DATUM 1988
<0.50	NOT DETECTED, VALUE SHOWN IS THE DETECTION LIMIT
(NS)	NOT SAMPLED
(NG)	NOT GAUGED
µg/L	MICROGRAMS PER LITER
*	WELL NOT USED FOR CONTOURING DUE TO INADEQUATE SURVEY
J	ESTIMATED VALUE, THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT (MDL) AND LESS THEN THE LIMIT OF QUANTITATION.
[1.53]	NAPL THICKNESS (FEET)
NAPL	NON - AQUEOUS PHASE LIQUID
BOLD	CONSTITUENT DETECTED ABOVE MODEL TOXICS CONTROL ACT (MTCA) METHOD A CLEANUP LEVELS

SAMPLE ID	
Date	Sample Date
GRO	Total Petroleum Hydrocarbons (TPH) - Gasoline Range Organics (µg/L) / [Duplicate (µg/L)]
DRO	TPH- Diesel Range Organics (µg/L) / [Duplicate (µg/L)]
HO	TPH - Heavy Oil Range Organics (µg/L) / [Duplicate (µg/L)]
B	Benzene (µg/L) / [Duplicate (µg/L)]
T	Toluene (µg/L) / [Duplicate (µg/L)]
E	Ethylbenzene (µg/L) / [Duplicate (µg/L)]
X	Total Xylenes (µg/L) / [Duplicate (µg/L)]
MTBE	Methyl Tertiary Butyl Ether (µg/L) / [Duplicate (µg/L)]
Naph	Total Naphthalenes (µg/L) / [Duplicate (µg/L)]

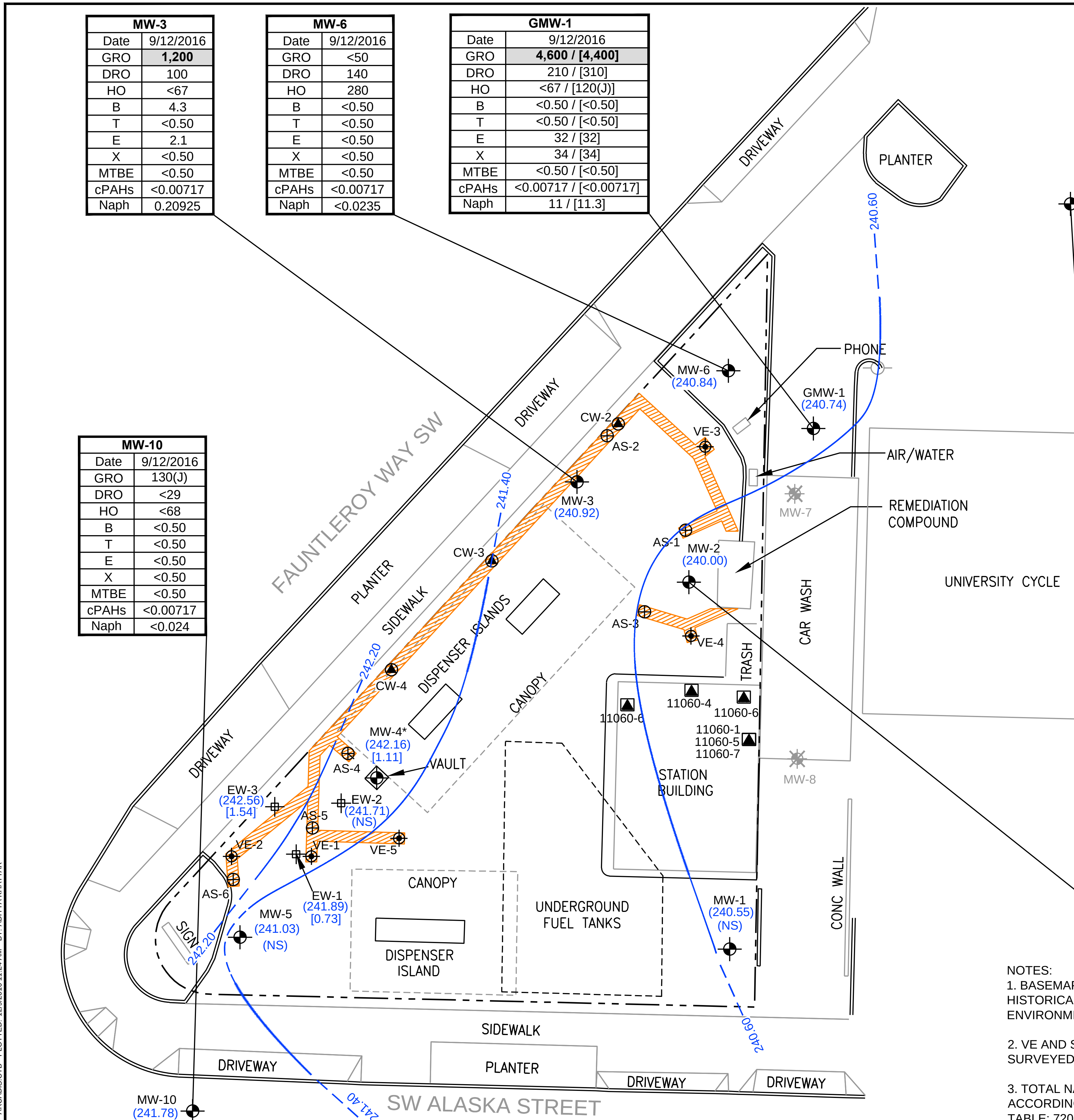
NOTES:
1. BASEMAP SUPPLIED BY OTAK, INC., IN 2010. HISTORICAL INFORMATION SUPPLIED BY DELTA ENVIRONMENTAL CONSULTANTS, INC.
2. VE AND SVE WELL LOCATIONS HAVE NOT BEEN SURVEYED AND ARE APPROXIMATE (EXCEPT FOR VE-1)
3. TOTAL NAPHTHALENES ARE CALCULATED ACCORDING TO THE MTCA CLEANUP REGULATION TABLE: 720-1 [d] & [r].

BP WEST COAST PRODUCTS LLC
FORMER BP STATION NO. 11060
4580 FAUNTLEROY WAY, SEATTLE, WASHINGTON
2016 ANNUAL SITE STATUS REPORT

GROUNDWATER ELEVATION CONTOUR MAP WITH ANALYTICAL RESULTS JUNE 6, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3



MW-3	
Date	9/12/2016
GRO	**1,200**
DRO	100
HO	<67
B	4.3
T	<0.50
E	2.1
X	<0.50
MTBE	<0.50
cPAHs	<0.00717
Naph	0.20925

MW-6	
Date	9/12/2016
GRO	<50
DRO	140
HO	280
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
cPAHs	<0.00717
Naph	<0.0235

GMW-1	
Date	9/12/2016
GRO	**4,600 / [4,400]**
DRO	210 / [310]
HO	<67 / [120(J)]
B	<0.50 / [<0.50]
T	<0.50 / [<0.50]
E	32 / [32]
X	34 / [34]
MTBE	<0.50 / [<0.50]
cPAHs	<0.00717 / [<0.00717]
Naph	11 / [11.3]

MW-10	
Date	9/12/2016
GRO	130(J)
DRO	<29
HO	<68
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
cPAHs	<0.00717
Naph	<0.024

MW-9	
Date	9/12/2016
GRO	<50
DRO	190
HO	170(J)
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50
cPAHs	<0.00717
Naph	<0.0235

MW-2	
Date	9/12/2016
GRO	**5,000**
DRO	**710**
HO	**660**
B	**130**
T	6.5
E	83
X	20
MTBE	2.2
cPAHs	NA
Naph	NA

LEGEND

- APPROXIMATE PROPERTY LINE
- CW-2 AS AND SVE COMBINATION WELL LOCATION
- MW-2 MONITORING WELL LOCATION
- MW-7 ABANDONED MONITORING WELL LOCATION
- VE VAPOR EXTRACTION WELL LOCATION (APPROXIMATE)
- AS AIR SPARGE WELL LOCATION (APPROXIMATE)
- 11060-1 PASSIVE VAPOR MONITORING LOCATION
- EW-1 EXTRACTION WELL
- TRENCH LOCATION (APPROXIMATE)
- 242.20 GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED (FEET ABOVE NAVD 88)
- (242.56) GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
- NAVD 88 NORTH AMERICAN VERTICAL DATUM 1988
- <0.50 NOT DETECTED, VALUE SHOWN IS THE DETECTION LIMIT
- (NS) NOT SAMPLED
- µg/L MICROGRAMS PER LITER
- * WELL NOT USED FOR CONTOURING DUE TO INADEQUATE SURVEY
- (J) ESTIMATED VALUE, THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT (MDL) AND LESS THEN THE LIMIT OF QUANTITATION.
- [1.11] NAPL THICKNESS (FEET)
- NAPL NON - AQUEOUS PHASE LIQUID
- NA NOT ANALYZED
- **BOLD** CONSTITUENT DETECTED ABOVE MODEL TOXICS CONTROL ACT METHOD A CLEANUP LEVELS

SAMPLE ID	
Date	Sample Date
GRO	Total Petroleum Hydrocarbons (TPH) - Gasoline Range Organics (µg/L) / [Duplicate (µg/L)]
DRO	TPH - Diesel Range Organics (µg/L) / [Duplicate (µg/L)]
HO	TPH - Heavy Oil Range Organics (µg/L) / [Duplicate (µg/L)]
B	Benzene (µg/L) / [Duplicate (µg/L)]
T	Toluene (µg/L) / [Duplicate (µg/L)]
E	Ethylbenzene (µg/L) / [Duplicate (µg/L)]
X	Total Xylenes (µg/L) / [Duplicate (µg/L)]
MTBE	Methyl Tertiary Butyl Ether (µg/L) / [Duplicate (µg/L)]
cPAHs	Total Carcinogenic Polycyclic Aromatic Hydrocarbons (µg/L) / [Duplicate (µg/L)]
Naph	Total Naphthalenes (µg/L) / [Duplicate (µg/L)]

0 20' 40'
GRAPHIC SCALE

NOTES:
1. BASEMAP SUPPLIED BY OTAK, INC., IN 2010. HISTORICAL INFORMATION SUPPLIED BY DELTA ENVIRONMENTAL CONSULTANTS, INC.

2. VE AND SVE WELL LOCATIONS HAVE NOT BEEN SURVEYED AND ARE APPROXIMATE (EXCEPT FOR VE-1).

3. TOTAL NAPHTHALENES ARE CALCULATED ACCORDING TO THE MTCA CLEANUP REGULATION TABLE: 720-1 [d] & [r].

BP WEST COAST PRODUCTS LLC
FORMER BP STATION NO. 11060
4580 FAUNTLEROY WAY, SEATTLE, WASHINGTON
2016 ANNUAL SITE STATUS REPORT

GROUNDWATER ELEVATION CONTOUR MAP WITH ANALYTICAL RESULTS SEPTEMBER 12, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

MW-3	
Date	12/12/2016
GRO	53(J)
DRO	210
HO	140(J)
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50

MW-6	
Date	12/12/2016
GRO	<50
DRO	<47
HO	<100
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50

GMW-1	
Date	12/12/2016
GRO	350
DRO	<50
HO	400
B	<0.50
T	<0.50
E	<0.50
X	<0.50
MTBE	<0.50

MW-4	
Date	12/12/2016
GRO	**25,000**
DRO	**2,100**
HO	380
B	**120**
T	37
E	57
X	1,000
MTBE	<2.5

MW-5	
Date	12/12/2016
GRO	**4,300**
DRO	**17,000**
HO	**<540**
B	1.7
T	1.8
E	9.0
X	4.5
MTBE	<0.50

MW-2	
Date	12/12/2016
GRO	**1,000 / [1,900]**
DRO	**590 /** [400]^{MB}
HO	<110 / **[860]**^{MB}
B	4.1 / [0.80(J)]
T	0.74(J) / [<0.50]
E	12 / [6.7]
X	10 / [1.9]
MTBE	<0.50 / [<0.50]

LEGEND

- APPROXIMATE PROPERTY LINE
- CW-2 — AS AND SVE COMBINATION WELL LOCATION
- MW-2 — MONITORING WELL LOCATION
- MW-7 — ABANDONED MONITORING WELL LOCATION
- VE — VAPOR EXTRACTION WELL LOCATION (APPROXIMATE)
- AS — AIR SPARGE WELL LOCATION (APPROXIMATE)
- 11060-1 — PASSIVE VAPOR MONITORING LOCATION
- EW-1 — EXTRACTION WELL
- TRENCH LOCATION (APPROXIMATE)
- 243.20 — GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED (FEET ABOVE NAVD 88)
- (244.51) — GROUNDWATER ELEVATION (FEET ABOVE NAVD 88)
- NAVD 88 — NORTH AMERICAN VERTICAL DATUM 1988
- <0.50 — NOT DETECTED, VALUE SHOWN IS THE DETECTION LIMIT
- (NS) — NOT SAMPLED
- (NG) — NOT GAUGED
- µg/L — MICROGRAMS PER LITER
- * — WELL NOT USED FOR CONTOURING DUE TO INADEQUATE SURVEY
- (J) — ESTIMATED VALUE, THE RESULT IS GREATER THAN OR EQUAL TO THE METHOD DETECTION LIMIT (MDL) AND LESS THEN THE LIMIT OF QUANTITATION
- [0.83] — NAPL THICKNESS (FEET)
- NAPL — NON - AQUEOUS PHASE LIQUID
- BOLD — CONSTITUENT DETECTED ABOVE MODEL TOXICS CONTROL ACT METHOD A CLEANUP LEVELS
- ^{MB} — HO AND DRO WERE DETECTED IN THE METHOD BLANK ASSOCIATED WITH THE DUPLICATE SAMPLE

SAMPLE ID	
Date	Sample Date
GRO	Total Petroleum Hydrocarbons (TPH) - Gasoline Range Organics (µg/L) / [Duplicate (µg/L)]
DRO	TPH - Diesel Range Organics (µg/L) / [Duplicate (µg/L)]
HO	TPH - Heavy Oil Range Organics (µg/L) / [Duplicate (µg/L)]
B	Benzene (µg/L) / [Duplicate (µg/L)]
T	Toluene (µg/L) / [Duplicate (µg/L)]
E	Ethylbenzene (µg/L) / [Duplicate (µg/L)]
X	Total Xylenes (µg/L) / [Duplicate (µg/L)]
MTBE	Methyl Tertiary Butyl Ether (µg/L) / [Duplicate (µg/L)]

0 20' 40'

GRAPHIC SCALE

NOTES:
1. BASEMAP SUPPLIED BY OTAK, INC., IN 2010.
HISTORICAL INFORMATION SUPPLIED BY DELTA ENVIRONMENTAL CONSULTANTS, INC.

2. VE AND SVE WELL LOCATIONS HAVE NOT BEEN SURVEYED AND ARE APPROXIMATE (EXCEPT FOR VE-1).

3. GROUNDWATER GRADIENT OBSERVED VARIES FROM USUAL GRADIENT DIRECTION OBSERVED AT THE SITE DUE TO ABSENCE OF GAUGING AT MW-9.

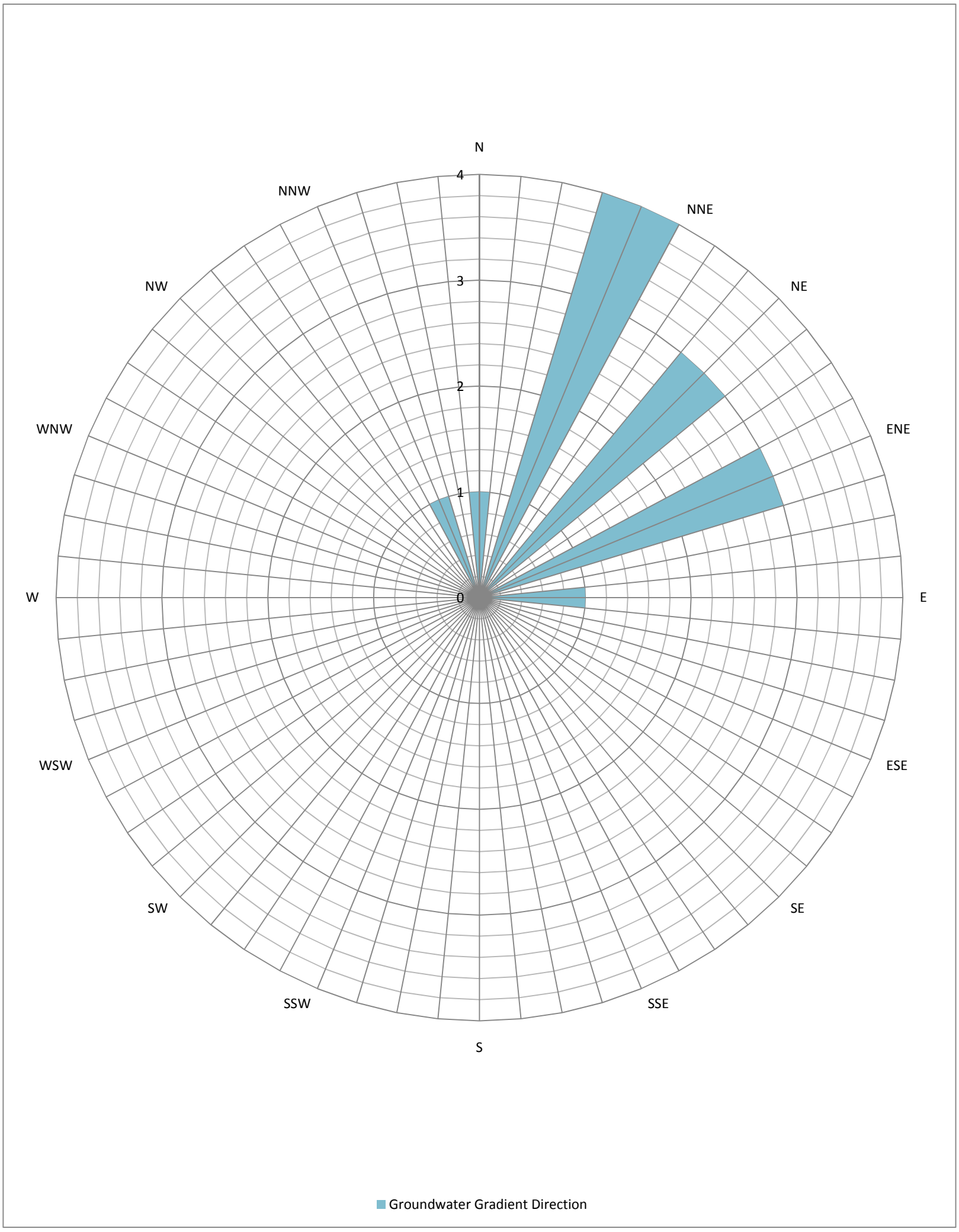
BP WEST COAST PRODUCTS LLC
FORMER ARCO FACILITY NO. 11060
4580 FAUNTLEROY WAY, SEATTLE, WASHINGTON
2016 ANNUAL SITE STATUS REPORT

GROUNDWATER ELEVATION CONTOUR MAP WITH ANALYTICAL RESULTS DECEMBER 12, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY:(EMERYVILLE) DIV/GROUP:(EMV) DB:(DCB) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF* E:\BP\16 Feb 2017\WA-11060\WA-11060 - Fig 5 - GW Map Q4 V1.dwg LAYOUT: 2 SAVED: 2/20/2017 2:33 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 2/20/2017 2:33 PM BY: ANNAPOORNA SHRUTHI BS



Legend

N=North
NNE= North Northeast
NE= Northeast
ENE= East Northeast
E= East
ESE= East Southeast
SE=Southeast
SSE= South Southeast
S= South
SW= Southwest
SSW= South Southwest
WSW= West South West
W= West
WNW= West Northwest
NW=Northwest
NNW= North Northwest

Note

Rose diagram based on gradient directions from groundwater monitoring events conducted by ARCADIS since top of casing survey in March 2010.

Number of Events Observed = 13

BP WEST COAST PRODUCTS LLC
FORMER ARCO FACILITY NO. 11060
4580 FAUNTLEROY WAY, SEATTLE, WASHINGTON

2016 ANNUAL SITE STATUS REPORT

HISTORICAL GROUNDWATER GRADIENT DIRECTION ROSE DIAGRAM

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

ATTACHMENT A

Groundwater Monitoring Field Data Sheets

ARCADIS Design & Consultancy for natural and built assets

Groundater Gauging Form

Project No.: 11060

Page 1 of 2

Site Location: 4580 Fauntleroy Way SW, Seattle WA

Prepared By: Ryan Brevchik Date: 3-2-16

Gauging Equipment: Water Probe / (Oil-Water Interface Probe) Other

Well ID	Time	Sheen or Odor	LNAPL Depth	LNAPL Thickness	DTW	TD	PID	Notes
AS-1	0814		—	—	23.31	27.32	~~114~~	water in well box
AS-2	0852		—	—	21.18	24.71	10.8	
AS-3	0832	HCLO	—	—	21.63	23.01 ~~19.68~~	99.4	water in well box
AS-4	0915		—	—	21.65	26.14	318	water in well box
AS-5	0920		—	—	—	24.20	1,033	Dry
AS-6	0933	HCLO	—	—	25.67	25.71	348	
EW-1	1030	HCLO	—	—	24.81	31.88	481	well lid damaged
EW-2	1036		—	—	24.80	32.59	465	
EW-3	1041	sheen	25.19'	~~1.4'~~ 0.25' see photo	~~26.59'~~ ~~25.19~~ 25.44'	31.43	601	well lid damaged
GMW-1	1007	sheen	—	—	22.48	34.79	123	water in well box
MW-1	1113		—	—	24.53	38.20	54.0	water in well box
MW-2	1001		—	—	23.79	28.73	460	
MW-3	0855		—	—	22.12	35.43	0.4	
MW-4	1046	Sheen	23.27'	1.4' see photo	~~24.67'~~ ~~23.27~~	28.01	745	
MW-5	1019	HCLO	—	—	25.55	28.75	449	

RCW 3-3-16

ARCADIS Design & Consultancy for natural and built assets

Groundater Gauging Form

Project No.: 11060

Site Location: 4580 Fauntleroy Way SW, Seattle WA

Prepared By: Ryan Brauchla Date: 3-2-16

Gauging Equipment: Water Probe / (Oil-Water Interface Probe) Other

Well ID	Time	Sheen or Odor	LNAPL Depth	LNAPL Thickness	DTW	TD	PID	Notes
MW-6				unable to locate				
MW-9	1012		—	—	22.29	35.52	0.0	
VE-1	0941	sheen	—	—	24.99	27.35	463	water in well box
VE-2	0927		—	—	13.84	14.39	22.2	water in well box
VE-3	0805		—	—	12.99	14.91	0.7	water in well box
VE-4	0824		—	—	14.45	14.90	27.6	NO water in well box
VE-5	0950		—	—	14.15	15.07	374	water in well box
~~AS-1~~	~~0814~~		~~—~~	~~—~~	~~23.31~~	~~27.32~~	~~144~~	~~water in well box~~
CW-2	0843		—	—	19.53	20.61	98.4	
CW-3	0905	HCLO	—	—	~~21.57~~ ~~22.57~~	22.32	337	water in well box
CW-4	0910				20.61	21.01	219	
~~unknown~~								
unknown	1025		—	—	25.46	47.75	0.9	located between VE-1 & VE-5

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Page 1 of 1

Project No. 11060 Well ID GWM-1 Date 3-2-16

Project Name/Location WA-11060/4580 Fauntleroy Way SW, Seattle WA Weather 55° overcast

Measuring Pt. Description T.O.C. Screen Setting (ft-bmp) — Casing Diameter (in.) 2" Well Material X PVC ___ SS

Static Water Level (ft-bmp) 22.46' Total Depth (ft-bmp) 34.79' Water Column/ Gallons in Well 12.31'/

MP Elevation — Pump Intake (ft-bmp) — Purge Method: No Purge Sample Method grab

Pump On/Off — Volumes Purged — Centrifugal ___ Submersible ___ Other bailer

Sample Time: Label 1200 Start ___ End ___ Replicate/ Code No. — Sampled by RJB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
1200	—	—	—	—	7.72	252.8	—	4.66	13.9	-89.0	clear	HC/O

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
DRO/HO	AMBER	2	HCl
BTEX/MTBE	VOA	3	HCl
cPAHs/Naphthalenes	AMBER	2	—

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: alley

Condition of Well: water in well box

Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Page 1 of 1

Project No. 11060 Well ID MW-1 Date 3-2-16

Project Name/Location 11060 / 4580 Fauntleroy Way SW Seattle WA Weather 55° overcast

Measuring Pt. Description t.o.c. Screen Setting (ft-bmp) — Casing Diameter (in.) 4' Well Material X PVC ___ SS

Static Water Level (ft-bmp) 24.53' Total Depth (ft-bmp) 38.20' Water Column/ Gallons in Well 13.67'

MP Elevation — Pump Intake (ft-bmp) — Purge Method: No Purge

Pump On/Off — Volumes Purged — Centrifugal ___ Submersible ___ Other bailer Sample Method grab

Sample Time: Label 1140 Replicate/ Code No. — Start ___ End ___ Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	~~Cond.~~ (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
1140	—	—	—	—	7.46	854	—	2.55	14.9	-65.7	cloudy	slight

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
DRO/HO	AMBER	2	HCl
BTEX/MTBE	VOA	3	HCl
cPAH/Naphthalene	AMBER	2	—

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

Well Information

Well Location: S of buildings

Condition of Well: water in well box

Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. 11060 Well ID MW-3 Date 3-2-16

Project Name/Location 11060 / 4580 Fauntleroy Way SW, Seattle, WA Weather 55° overcast

Measuring Pt. Description T.O.C. Screen Setting (ft-bmp) — Casing Diameter (in.) 4" Well Material X PVC ___ SS

Static Water Level (ft-bmp) 23.79' Total Depth (ft-bmp) 28.73' Water Column/ Gallons in Well 4.94'

MP Elevation — Pump Intake (ft-bmp) — Purge Method: NO PURGE Sample Method grab

Pump On/Off — Volumes Purged — Centrifugal ___ Submersible ___ Other bailer

Sample Time: Label 1310 Start ___ End ___ Replicate/ Code No. — Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1310	—	—	—	—	7.47	1257	—	1.58	14.4	-59.2		

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
DRO/HO	AMBER	2	HCl
BTEX/MTBE	VOA	3	HCl
cPAHs/Naphthalenes	AMBER	2	

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: in front of system

Condition of Well: good

Well Completion: (Flush Mount) / Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

ARCADIS Design & Consultancy for natural and built assets

GROUNDWATER SAMPLING LOG

Project No. 11060 Well ID MW-3 Date 3-2-16

Project Name/Location 11060 / 4580 Fauntleroy Way SW, Seattle WA Weather 55° overcast

Measuring Pt. Description t.o.c. Screen Setting (ft-bmp) — Casing Diameter (in.) 4" Well Material X PVC ___ SS

Static Water Level (ft-bmp) 22.12' Total Depth (ft-bmp) 35.43' Water Column/ Gallons in Well 13.31'/

MP Elevation — Pump Intake (ft-bmp) — Purge Method: No Purge Centrifugal ___ Submersible ___ Other ___ Sample Method grab

Pump On/Off — Volumes Purged —

Sample Time: Label 1240 Start ___ End ___ Replicate/ Code No. — Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance	
											Color	Odor
1240	—	—	—	—	7.67	486.3	—	5.16	13.9	77.4	clear	HC(O)

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
DRO/HO	AMBER	2	HCl
BTEX/MTBE	VOA	3	HCl
cPAHs/Naphthalenes	AMBER	2	—

Well Casing Volumes

Gallons/Foot: 1" = 0.04; 1.25" = 0.06; 1.5" = 0.09; 2" = 0.16; 2.5" = 0.26; 3" = 0.37; 3.5" = 0.50; 4" = 0.65; 6" = 1.47

Well Information

Well Location: in N entrance

Condition of Well: good

Well Completion: (Flush Mount) Stick Up

Well Locked at Arrival: Yes / (No)

Well Locked at Departure: Yes / (No)

Key Number To Well:

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GROUNDWATER SAMPLING LOG

Project No. 11060 Well ID MW-5 Date 3/2/16

Project Name/Location 11060/ 4860 Fauntleroy Way SW, Seattle WA Weather 35°F, overcast

Measuring Pt. Description T.O.C. Screen Setting (ft-bmp) — Casing Diameter (in.) 4" Well Material X PVC ___ SS

Static Water Level (ft-bmp) 25.55' Total Depth (ft-bmp) 28.75' Water Column/ Gallons in Well 3.2'

MP Elevation — Pump Intake (ft-bmp) — Purge Method: No Purge Centrifugal ___ Submersible ___ Other bailer Sample Method grab

Pump On/Off — Volumes Purged —

Sample Time: Label 1327 Start ___ End ___ Replicate/ Code No. — Sampled by RB

Time	Minutes Elapsed	Rate (gpm) (mL/min)	Depth to Water (ft)	Gallons Purged	pH	Cond. (mMhos) (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C) (°F)	Redox (mV)	Appearance Color	Appearance Odor
1327	—	—	—	—	7.46	1031	—	1.82	14.8	-155.2		

Constituents Sampled	Container	Number	Preservative
GRO	VOA	3	HCl
DRO/HO	AMBER	2	HCl
BTEX/MTBE	VOA	3	HCl
cPAHs/Naphthalene	AMBER	2	

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

Well Information

Well Location: west corner of site Well Locked at Arrival: Yes / (No)

Condition of Well: good Well Locked at Departure: Yes / (No)

Well Completion: (Flush Mount) / Stick Up Key Number To Well:

Groundwater Monitoring Field Data Form
Site: WA-11060

Gauging Data

Date 06/06/2016
Sampler Eric Krueger

Well	Date/Time	Depth To Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
EW-1	06/06/2016 09:10	25.94	30.00	25.28	17.0	
EW-2	06/06/2016 09:03	25.17	29.81		136.6	
EW-3	06/06/2016 08:55					Couldn't open well lid
GMW-1	06/06/2016 07:58	23.51	34.42		125.8	
MW-1	06/06/2016 07:45	24.82	27.85		25.8	
MW-2	06/06/2016 08:25	24.49	27.21		533.2	
MW-3	06/06/2016 08:10	23.76	33.40		0.1	
MW-4	06/06/2016 09:22	25.86	27.50	24.33	9.5	
MW-5	06/06/2016 08:38	25.74	27.55		397.9	
MW-6	06/06/2016 08:17	23.82	29.25		0.2	
MW-9	06/06/2016 08:45	22.01	35.01		0.1	

Sampler: Eric Krueger

Groundwater Monitoring Field Data Form
Site: WA-11060

GMW-1

Date	06/06/2016	Weather Conditions	Sunny	Depth to Water (ft bmp)	23.51
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	34.42
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	10.91
		Casing Diameter (in)	2	Gallons in Well	1.78
Purge Method	Volume Purge - Hand Bail	Pump Intake Depth (ft bmp)		Total Volume to Remove	
Purge Volume Units	Gal	Casing Volume to Remove			
Sampling Type	No Purge				
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp °C	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
11:36		17.5	7.30	416.5	-96.5	2.55		23.51	

Sampling Summary

Sample Date	06/06/2016	Odor	No
Sample Time	11:15	Analysis	NWTPH-GX, NWTPH-DX,SW8270C-SIM
Sample ID	WA-11060-GMW-1(2Q16)	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL
Dup Sample Time			
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well is Securable by Design	X			
Is Well ID Visible?	X			
Water in the well box	X			
Sleeve around the well box in good condition	X			

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-2

Date	06/06/2016	Weather Conditions	Sunny	Depth to Water (ft bmp)	24.49
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	27.21
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	2.72
		Casing Diameter (in)	4	Gallons in Well	1.78
Purge Method	Volume Purge - Hand Bail	Pump Intake Depth (ft bmp)		Total Volume to Remove	
Purge Volume Units	Gal	Casing Volume to Remove			
Sampling Type	No Purge				
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp °C	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
12:16		18.3	7.20	1129	-90.3	2.17		24.49	

Sampling Summary

Sample Date	06/06/2016	Odor	HCLO
Sample Time	11:45	Analysis	NWTPH-GX, NWTPH-DX,SW8270C-SIM
Sample ID	WA-11060-MW-2(2Q16)	COC	
Duplicate Sample ID	DUP -1	Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL
Dup Sample Time	11:45		
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well is Securable by Design	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			

ARCADIS Design & Consultancy for natural and built assets

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-3

Date	06/06/2016	Weather Conditions	Sunny	Depth to Water (ft bmp)	23.76
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	33.40
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	9.64
		Casing Diameter (in)	4	Gallons in Well	6.30
Purge Method	Volume Purge - Hand Bail	Pump Intake Depth (ft bmp)		Total Volume to Remove	
Purge Volume Units	Gal	Casing Volume to Remove			
Sampling Type	No Purge				
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp °C	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
12:43		18.0	7.23	742	-88.7	1.79		23.76	

Sampling Summary

Sample Date	06/06/2016	Odor	No
Sample Time	12:25	Analysis	NWTPH-GX, NWTPH-DX,SW8270C-SIM
Sample ID	WA-11060-MW-3(2Q16)	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL
Dup Sample Time			
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well is Securable by Design	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-5

Date	06/06/2016	Weather Conditions	Sunny	Depth to Water (ft bmp)	25.74
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	27.55
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	1.81
		Casing Diameter (in)	4	Gallons in Well	1.18
Purge Method	Volume Purge - Hand Bail	Pump Intake Depth (ft bmp)		Total Volume to Remove	
Purge Volume Units	Gal	Casing Volume to Remove			
Sampling Type	No Purge				
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp °C	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
13:12		18.5	7.26	444.6	-90.1	1.40		25.74	

Sampling Summary

Sample Date	06/06/2016	Odor	Slight HCLO
Sample Time	13:00	Analysis	NWTPH-GX, NWTPH-DX,SW8270C-SIM
Sample ID	WA-11060-MW-5(2Q16)	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL
Dup Sample Time			
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well is Securable by Design	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-6

Date	06/06/2016	Weather Conditions	Sunny	Depth to Water (ft bmp)	23.82
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	29.25
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	5.43
		Casing Diameter (in)	2	Gallons in Well	0.89
Purge Method	Volume Purge - Hand Bail	Pump Intake Depth (ft bmp)		Total Volume to Remove	
Purge Volume Units	Gal	Casing Volume to Remove			
Sampling Type	No Purge				
Comments					

Field Parameters

Time	Cuml Vol Purged	Temp °C	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
11:06		18.0	7.38	108.0	127.2	2.24		23.82	

Sampling Summary

Sample Date	06/06/2016	Odor	No
Sample Time	10:50	Analysis	NWTPH-GX,SW8270C-SIM
Sample ID	WA-11060-MW-6(2Q16)	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Naphthalenes, cPAHs 2x 250 ml amber unpreserved,Dx- 2x 250 ml amber glass HCL
Dup Sample Time			
		Remarks	

Sampler: Eric Krueger

Well Integrity Checklist

Item	Yes	No	NA	Notes
Well is Securable by Design	X			
Is Well ID Visible?	X			
Water in the well box	X			
Sleeve around the well box in good condition	X			

WELL GAUGING DATA

Project # 160912-LB2 Date 9/12/16 Client ARCADIS

Site 4580 FAUNTLEROY WAY SW, SEATTLE, WA

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Water/ SPH Meter	PID
EW-1	1004	6	ODOR	26.16	0.73	—	26.89	—	**	678
EW-2	1009	6	ODOR				26.22	29.81	**	13.3
EW-3	0956	6	ODOR	25.63	1.54	—	27.17	—	**	341
GMW-1	1052	2					24.89	34.12	*	0.0
MW-1	1149	4					26.88	27.00	*	0.0
MW-2	1243	4					26.69	27.71	*	9.6
MW-3	1122	4					25.08	33.96	*	0.0
MW-4	1012	4	ODOR	25.40	1.11	—	26.51	—	**	116.4
MW-5	1228	4					27.43	27.58	**	18.6
MW-6	1024	2					25.22	29.23	*	0.0
MW-9	1358	2					23.43	34.89	*	0.0
MW-10	1202	2					26.52	35.21	*	0.0

Instruments Used: Durham Geoslope Water Level Indicator* GeoTech Oil/Water Interface Probe** Other: _____

Survey Point - Top of casing at all wells

WELL MONITORING DATA SHEET

Project #: 160912-LB2	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: GMW-1	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 34.12	Depth to Water: 24.89
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Waterra
Disposable Bailer / Peristaltic
Positive Air Displacement / Extraction Pump
Electric Submersible
Other: ____
Model #: Screen Interval: ____

Sampling Method:
Bailer
(Disposable Bailer)
Extraction Port
Dedicated Tubing
Other: ____
Pump Depth: ____

Instruments Used:
Myron L Ultrameter / HACH (Turbidimeter)
Durham Geoslope Indicator / YSI 556 Flow-Thru Cell
GeoTech Interface Probe / YSI 550 DO Meter
MMC Interface Probe / Other: ____

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

____ (Gals.) X ____ = ____ Gals.
1 Case Volume / Specified Volumes / Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
	———	No	PURGE SAMPLE TAKEN		———	———
1100	66.0	6.73	453	>1000	———	

Did well dewater? Yes No Gallons actually evacuated: ———

Sampling Date: 9/12/16 Sampling Time: 1100 Depth to Water: 24.89

Sample I.D.: GMW-1-09122016 Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: BD-11060-09122016 Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	0.11	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-71	mV

WELL MONITORING DATA SHEET

Project #: 160912-L82	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-1	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: 27.00	Depth to Water: 26.88
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer
Disposable Bailer
Positive Air Displacement
Electric Submersible
Other: ___
Waterra
Peristaltic
Extraction Pump
Model #: Screen Interval: ___

Sampling Method:
Bailer
(Disposable Bailer)
Extraction Port
Dedicated Tubing
Other: ___
Pump Depth: ___

Instruments Used:
Myron L Ultrameter
Durham Geoslope Indicator
GeoTech Interface Probe
MMC Interface Probe
(HACH Turbidimeter)
YSI 556 Flow-Thru Cell
YSI 550 DO Meter
Other: ___

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___ (Gals.) X ___ = ___ Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
		—	INSUFFICIENT	WATER TO	SAMPLE	—
		—	NO SAMPLE	TAKEN	—	—

Did well dewater? Yes No Gallons actually evacuated:

Sampling Date: 9/12/16 Sampling Time: Depth to Water:

Sample I.D.: Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 160912-LB2	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-2	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: 27.71	Depth to Water: 26.69
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Waterra
Disposable Bailer / Peristaltic
Positive Air Displacement / Extraction Pump
Electric Submersible
Other: ___
Model #: Screen Interval: ___

Sampling Method:
Bailer
(Disposable) Bailer
Extraction Port
Dedicated Tubing
Other: ___
Pump Depth: ___

Instruments Used:
Myron L (Ultrameter) / HACH (Turbidimeter)
Durham Geoslope Indicator / YSI 556 Flow-Thru Cell
GeoTech Interface Probe / YSI 550 DO Meter
MMC Interface Probe / Other: ___

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___ (Gals.) X ___ = ___ Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
—	—	NO PURGE SAMPLE TAKEN			—	—
1315	67.1	6.62	1168	>1000	—	
	—	WELL DEWATERED AFTER 6 VOLS +			1 1L AMBER	—

Did well dewater? Yes No Gallons actually evacuated: —

Sampling Date: 9/12/16 Sampling Time: 1315 Depth to Water: 26.69

Sample I.D.: MW-2-09122016 Laboratory: Test America (Other): LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	0.14	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-13	mV

WELL MONITORING DATA SHEET

Project #: 160912-LB2	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-3	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: 33.96	Depth to Water: 25.08
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Waterra
Disposable Bailer / Peristaltic
Positive Air Displacement / Extraction Pump
Electric Submersible
Other: /
Model #: Screen Interval:

Sampling Method:
Bailer
Disposable Bailer
Extraction Port
Dedicated Tubing
Other:
Pump Depth:

Instruments Used:
Myron L Ultrameter / HACH Turbidimeter
Durham Geoslope Indicator / YSI 556 Flow-Thru Cell
GeoTech Interface Probe / YSI 550 DO Meter
MMC Interface Probe / Other:

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___ (Gals.) X ___ = ___ Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
	—	—	NO PURGE	SAMPLE TAKEN	—	—
1130	67.8	6.79	418	118	—	

Did well dewater? Yes (No) Gallons actually evacuated:

Sampling Date: 9/12/16 Sampling Time: 1130 Depth to Water: 25.08

Sample I.D.: MW-3-09122016 Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	0.19	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-49.6	mV

WELL MONITORING DATA SHEET

Project #: 160912-L82	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-4	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: —	Depth to Water: 26.51
Depth to Free Product: 25.40	Thickness of Free Product (feet): 1.11
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Other: ___
Waterra / Peristaltic / Extraction Pump
Model #: Screen Interval:___

Sampling Method:
Bailer / (Disposable) Bailer / Extraction Port / Dedicated Tubing / Other: ___
Pump Depth:___

Instruments Used:
Myron L (Ultrameter) / Durham Geoslope Indicator / GeoTech Interface Probe / MMC Interface Probe
(HACH) Turbidimeter / YSI 556 Flow-Thru Cell / YSI 550 DO Meter / Other: ___

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___ (Gals.) X ___ = ___ Gals.
1 Case Volume / Specified Volumes / Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
	—	1.11'	OF SPH DETECTED		W/	
			INTERFACE PROBE		—	
	—	—	NO SAMPLE TAKEN		—	—

Did well dewater? Yes (No) Gallons actually evacuated:

Sampling Date: 9/12/16 Sampling Time: Depth to Water:

Sample I.D.: Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 160912-L82	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-5	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: 27.58	Depth to Water: 27.43
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer
Disposable Bailer
Positive Air Displacement
Electric Submersible
Other: ___
Waterra
Peristaltic
Extraction Pump
Model #: Screen Interval: ___

Sampling Method:
Bailer
Disposable Bailer
Extraction Port
Dedicated Tubing
Other ___
Pump Depth: ___

Instruments Used:
Myron L Ultrameter
Durham Geoslope Indicator
GeoTech Interface Probe
MMC Interface Probe
HACH Turbidimeter
YSI 556 Flow-Thru Cell
YSI 550 DO Meter
Other: ___

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___ (Gals.) X ___ = ___ Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
		INSUFFICIENT WATER TO SAMPLE				
		NO SAMPLE TAKEN				

Did well dewater? Yes (No) Gallons actually evacuated:

Sampling Date: 9/12/16 Sampling Time: Depth to Water:

Sample I.D.: Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 160912-LB2	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-6	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 29.23	Depth to Water: 25.22
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Waterra
Disposable Bailer / Peristaltic
Positive Air Displacement / Extraction Pump
Electric Submersible
Other: _____
Model #: Screen Interval: _____

Sampling Method:
Bailer
(Disposable) Bailer
Extraction Port
Dedicated Tubing
Other: _____
Pump Depth: _____

Instruments Used:
Myron L (Ultrameter) / HACH (Turbidimeter)
Durham Geoslope Indicator / YSI 556 Flow-Thru Cell
GeoTech Interface Probe / YSI 550 DO Meter
MMC Interface Probe / Other: _____

_____(Gals.) X _____ = _____ Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond. (mS or (uS))	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
	—		NO PURGE	SAMPLE TAKEN	—	
1030	65.3	6.86	223	73	—	
	—	WELL	DEWATERED	@ 6 VOA'S	+3 1L	AMBERS —

Did well dewater? (Yes) No Gallons actually evacuated: —

Sampling Date: 9/12/16 Sampling Time: 1030 Depth to Water: 25.22

Sample I.D.: MW-6 · 09122016 Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-145 mV

WELL MONITORING DATA SHEET

Project #: 160912-LB2	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-9	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 34.89	Depth to Water: 23.43
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Waterra /
Disposable Bailer / Peristaltic /
Positive Air Displacement / Extraction Pump /
Electric Submersible
Other: /
Model #: Screen Interval:

Sampling Method:
Bailer
Disposable Bailer
Extraction Port
Dedicated Tubing
Other:
Pump Depth:

Instruments Used:
Myron L Ultrameter / HACH Turbidimeter
Durham Geoslope Indicator / YSI 556 Flow-Thru Cell
GeoTech Interface Probe / YSI 550 DO Meter
MMC Interface Probe / Other:

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___(Gals.) X ___ = ___Gals.
1 Case Volume / Specified Volumes / Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or (uS))	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
	———	No	PURGE SAMPLE TAKEN		———	———
1400	67.8	7.34	588	23	———	

Did well dewater? Yes No Gallons actually evacuated: ———

Sampling Date: 9/12/16 Sampling Time: 1400 Depth to Water: 23.43

Sample I.D.: MW-9-09122016 Laboratory: Test America Other: LANCASTER

Analyzed for: (GRO) BTEX OXYS ETHANOL Other: SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	0.54	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-7	mV

WELL MONITORING DATA SHEET

Project #: 160912-L82	Station #: 11060
Sampler: LB	Date: 9/12/16
Well I.D.: MW-10	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 38.21	Depth to Water: 26.52
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
Bailer / Waterra
Disposable Bailer / Peristaltic
Positive Air Displacement / Extraction Pump
Electric Submersible
Other: /
Model #: Screen Interval:

Sampling Method:
Bailer
Disposable Bailer
Extraction Port
Dedicated Tubing
Other:
Pump Depth:

Instruments Used:
Myron L Ultrameter / HACH Turbidimeter
Durham Geoslope Indicator / YSI 556 Flow-Thru Cell
GeoTech Interface Probe / YSI 550 DO Meter
MMC Interface Probe / Other:

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

___ (Gals.) X ___ = ___ Gals.
1 Case Volume / Specified Volumes / Calculated Volume

Time	Temp (°F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations/ DTW
	—	No Purge Sample Taken			—	—
1210	66.7	7.39	823	74	—	

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 9/12/16 Sampling Time: 1210 Depth to Water: 26.52

Sample I.D.: MW-10-09122016 Laboratory: Test America (Other) LANCASTER

Analyzed for: (GRO) (BTEX) OXYS ETHANOL (Other:) SEE COC

Duplicate I.D.: Analyzed for: GRO BTEX OXYS ETHANOL Other:

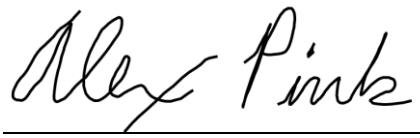
D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	0.09	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	-136	mV

Groundwater Monitoring Field Data Form
Site: WA-11060

Gauging Data

Date 12/12/2016
Sampler Alexander Pink

Well	Date/Time	Depth To Water (ft)	Well Depth (ft)	Depth to LNAPL (ft)	PID (ppmv)	Remarks
EW-1	12/12/2016 11:05	25.49	29.60		526.9	NS; NAPL
EW-2	12/12/2016 10:54	24.64	29.89		149.6	NS
EW-3	12/12/2016 11:28	25.58	29.79		399.3	NS; NAPL
GMW-1	12/12/2016 09:58	22.95	34.27		493.4	NP
MW-1	12/12/2016 09:45	24.76	27.31		99.2	NS
MW-2	12/12/2016 10:33	23.96	27.87		78.5	NP
MW-3	12/12/2016 10:23	22.42	34.20		3.1	NP
MW-4	12/12/2016 10:44	23.27	27.10		171.8	NP
MW-5	12/12/2016 11:40	25.36	27.71		426.3	NP
MW-6	12/12/2016 10:10	22.66	29.43		3.0	NP



Sampler: Alex Pink

Groundwater Monitoring Field Data Form
Site: WA-11060

GMW-1

Date	12/12/2016	Weather Conditions	Sunny	Depth to Water (ft bmp)	22.95
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	34.27
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	11.32
		Casing Diameter (in)	2	Gallons in Well	1.85
Purge Method	No Purge Device	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Purge Volume Units	ml	Casing Volume to Remove			
Sampling Type	No Purge				
Comments	NP				

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
13:37		13.7	7.36	1004	350.5	1.55			NP

Sampling Summary

Sample Date	12/12/2016	Odor	No
Sample Time	13:35	Analysis	SW8260B,NWTPH-Gx,NWTPH-Dx
Sample ID	GMW-1-Q416	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Dx- 2x 250 ml amber glass HCL
Dup Sample Time		Remarks	NP

Sampler: Alex Pink

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box	X			
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				
Remarks				

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-2

Date	12/12/2016	Weather Conditions	Cloudy	Depth to Water (ft bmp)	23.96
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	27.87
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	3.91
		Casing Diameter (in)	4	Gallons in Well	2.55
Purge Method	No Purge Device	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Purge Volume Units		Casing Volume to Remove			
Sampling Type	No Purge				
Comments	NP				

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
15:09		12.1	7.50	581.0	210.9	1.30			NP

Sampling Summary

Sample Date	12/12/2016	Odor	HCLO
Sample Time	15:05	Analysis	SW8260B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-2-Q416	COC	
Duplicate Sample ID	DUP-1	Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Dx- 2x 250 ml amber glass HCL
Dup Sample Time	15:05		
		Remarks	NP

Sampler: Alex Pink

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				
Remarks				

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-3

Date	12/12/2016	Weather Conditions	Cloudy	Depth to Water (ft bmp)	22.42
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	34.20
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	11.78
		Casing Diameter (in)	4	Gallons in Well	7.69
Purge Method	No Purge Device	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Purge Volume Units		Casing Volume to Remove			
Sampling Type	No Purge				
Comments	NP				

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
14:42		12.3	7.50	458.9	286.3	2.78			NP

Sampling Summary

Sample Date	12/12/2016	Odor	No
Sample Time	14:36	Analysis	SW8260B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-3-Q416	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Dx- 2x 250 ml amber glass HCL
Dup Sample Time		Remarks	NP

Sampler: Alex Pink

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				
Remarks				

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-4

Date	12/12/2016	Weather Conditions	Cloudy	Depth to Water (ft bmp)	23.27
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	27.10
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	3.83
		Casing Diameter (in)	4	Gallons in Well	2.5
Purge Method	No Purge Device	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Purge Volume Units		Casing Volume to Remove			
Sampling Type	No Purge				
Comments	NP				

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
16:33		13.2	7.58	697	116.8	1.41			NP

Sampling Summary

Sample Date	12/12/2016	Odor	HCLO
Sample Time	16:20	Analysis	SW8260B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-4-Q416	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Dx- 2x 250 ml amber glass HCL
Dup Sample Time			
		Remarks	NP

Sampler: Alex Pink

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Utility Vault
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				
Remarks				

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-5

Date	12/12/2016	Weather Conditions	Cloudy	Depth to Water (ft bmp)	25.36
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	27.71
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	2.35
		Casing Diameter (in)	4	Gallons in Well	1.53
Purge Method	No Purge Device	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Purge Volume Units		Casing Volume to Remove			
Sampling Type	No Purge				
Comments	NP				

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
15:58		11.7	7.35	1710	141.5	1.49			NP

Sampling Summary

Sample Date	12/12/2016	Odor	HCLO
Sample Time	15:51	Analysis	SW8260B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-5-Q416	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Dx- 2x 250 ml amber glass HCL
Dup Sample Time		Remarks	NP

Sampler: Alex Pink

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box		X		
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				
Remarks				

Groundwater Monitoring Field Data Form
Site: WA-11060

MW-6

Date	12/12/2016	Weather Conditions	Cloudy	Depth to Water (ft bmp)	22.66
Project Number	GP09BPNA.WA48	Water Quality Meter	YSI	Measured Well Depth (ft bmp)	29.43
Address	4580 Fauntleroy Way Southwest, Seattle, WA98126	Casing Material	PVC	Water Column in Well	6.77
		Casing Diameter (in)	2	Gallons in Well	1.1
Purge Method	No Purge Device	Pump Intake Depth (ft bmp)		Total Volume to Remove	0.0
Purge Volume Units		Casing Volume to Remove			
Sampling Type	No Purge				
Comments	NP				

Field Parameters

Time	Cuml Vol Purged	Temp ºC	pH	Conductivity (uS/cm)	ORP (mV)	DO (mg/L)	Turbidity (NTU)	DTW (ft)	Remarks
14:09		13.2	7.66	163.6	258.8	1.99			NP

Sampling Summary

Sample Date	12/12/2016	Odor	No
Sample Time	14:05	Analysis	SW8260B,NWTPH-Gx,NWTPH-Dx
Sample ID	MW-6-Q416	COC	
Duplicate Sample ID		Bottles	BTEX 3x of 40 ml - HCL,Gx 3x 40 ml - HCL,Dx- 2x 250 ml amber glass HCL
Dup Sample Time		Remarks	NP

Sampler: Alex Pink

Well Integrity Checklist

Item	Yes	No	NA	Notes
Type of well head				Round 12"
Well Secured on initial inspection	X			
Is Well ID Visible?	X			
Water in the well box	X			
Sleeve around the well box in good condition	X			
Any cleanup performed (explain)				
Any repairs/replacement (explain)				
Remarks				

ATTACHMENT B

Laboratory Report and Chain of Custody Documents

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: March 23, 2016

Project: WA-11060

Submittal Date: 03/04/2016
Group Number: 1637355
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
GMW-1 Grab Water	8270921
MW-1 Grab Water	8270922
MW-2 Grab Water	8270923
MW-3 Grab Water	8270924
MW-5 Grab Water	8270925
Trip Blank Water	8270926

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	Atlantic Richfield c/o ARCADIS	Attn: Ophelie Encelle
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Butt
Specialist

(717) 556-7236

Project Name: WA-11060
LL Group #: 1637355

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260B, GC/MS Volatiles

Sample #s: 8270923

Reporting limits were raised due to interference from the sample matrix.

Batch #: W160751AA (Sample number(s): 8270923, 8270925 UNSPK: P275202)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: Ethylbenzene

SW-846 8270C SIM, GC/MS Semivolatiles

Batch #: 16068WAI026 (Sample number(s): 8270921-8270925 UNSPK: P271614)

The recovery(ies) for the following analyte(s) in the MS and/or MSD was outside the acceptance window: 1-Methylnaphthalene, Naphthalene

Sample Description: GMW-1 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270921
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 12:00 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSG1

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	0.043	J	0.010	0.050	1
08357	Benzo(a)pyrene	50-32-8	0.029	J	0.010	0.050	1
08357	Benzo(b)fluoranthene	205-99-2	0.022	J	0.010	0.050	1
08357	Benzo(k)fluoranthene	207-08-9	0.031	J	0.010	0.050	1
08357	Chrysene	218-01-9	0.071		0.010	0.050	1
08357	Dibenz(a,h)anthracene	53-70-3	0.061		0.010	0.050	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.032	J	0.010	0.050	1
08357	1-Methylnaphthalene	90-12-0	0.079		0.010	0.050	1
08357	2-Methylnaphthalene	91-57-6	0.17		0.010	0.050	1
08357	Naphthalene	91-20-3	N.D.		0.030	0.060	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	1,400		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.		46	100	1
12899	DX HRO C24-C40	n.a.	N.D.		100	250	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	N160702AA	03/11/2016 02:25	Graham A Goulding	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N160702AA	03/11/2016 02:25	Graham A Goulding	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16068WAI026	03/15/2016 23:32	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16068WAI026	03/09/2016 02:15	Sherry L Morrow	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16067A94A	03/08/2016 15:43	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16067A94A	03/08/2016 15:43	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Sample Description: GMW-1 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270921
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 12:00 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSG1

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	160700024A	03/14/2016 16:19	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	160700024A	03/11/2016 09:30	Bradley W VanLeuven	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-1 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270922
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 11:40 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM1

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	1.2		0.50	1.0	1
10335	Ethylbenzene	100-41-4	0.77	J	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	3.0		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.011	0.057	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.011	0.057	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.011	0.057	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.011	0.057	1
08357	Chrysene	218-01-9	N.D.		0.011	0.057	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.011	0.057	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.011	0.057	1
08357	1-Methylnaphthalene	90-12-0	0.12		0.011	0.057	1
08357	2-Methylnaphthalene	91-57-6	0.20		0.011	0.057	1
08357	Naphthalene	91-20-3	0.40		0.034	0.068	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	460		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	140		51	110	1
12899	DX HRO C24-C40	n.a.	N.D.		110	290	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	N160702AA	03/11/2016 03:11	Graham A Goulding	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N160702AA	03/11/2016 03:11	Graham A Goulding	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16068WAI026	03/16/2016 00:01	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16068WAI026	03/09/2016 02:15	Sherry L Morrow	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16069A94A	03/10/2016 13:22	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16069A94A	03/10/2016 13:22	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-1 Grab Water**
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270922
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 11:40 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM1

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	160700024A	03/14/2016 16:43	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	160700024A	03/11/2016 09:30	Bradley W VanLeuven	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-2 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270923
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 13:10 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM2

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	54		5.0	10	10
10335	Ethylbenzene	100-41-4	94		5.0	10	10
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		5.0	10	10
10335	Toluene	108-88-3	5.3	J	5.0	10	10
10335	Xylene (Total)	1330-20-7	26		5.0	10	10
	Reporting limits were raised due to interference from the sample matrix.						
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.051	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.051	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.051	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.051	1
08357	Chrysene	218-01-9	N.D.		0.010	0.051	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.051	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.051	1
08357	1-Methylnaphthalene	90-12-0	1.7		0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	0.34		0.010	0.051	1
08357	Naphthalene	91-20-3	4.3		0.031	0.062	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	5,100		250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	1,600		46	100	1
12899	DX HRO C24-C40	n.a.	N.D.		100	260	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	W160751AA	03/15/2016 18:08	Nicole S Lamoreaux	10
01163	GC/MS VOA Water Prep	SW-846 5030B	1	W160751AA	03/15/2016 18:08	Nicole S Lamoreaux	10
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16068WAI026	03/16/2016 00:30	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16068WAI026	03/09/2016 02:15	Sherry L Morrow	1

*=This limit was used in the evaluation of the final result

Sample Description: **MW-2 Grab Water**
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270923
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 13:10 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM2

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16069A94A	03/10/2016 21:28	Brett W Kenyon	5
01146	GC VOA Water Prep	SW-846 5030B	1	16069A94A	03/10/2016 21:28	Brett W Kenyon	5
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	160700024A	03/14/2016 17:07	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	160700024A	03/11/2016 09:30	Bradley W VanLeuven	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270924
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 12:40 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM3

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.010	0.050	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.010	0.050	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.010	0.050	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.010	0.050	1
08357	Chrysene	218-01-9	N.D.		0.010	0.050	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.010	0.050	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.010	0.050	1
08357	1-Methylnaphthalene	90-12-0	N.D.		0.010	0.050	1
08357	2-Methylnaphthalene	91-57-6	N.D.		0.010	0.050	1
08357	Naphthalene	91-20-3	N.D.		0.030	0.060	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.		48	110	1
12899	DX HRO C24-C40	n.a.	150	J	110	270	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	N160702AA	03/10/2016 23:20	Graham A Goulding	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N160702AA	03/10/2016 23:20	Graham A Goulding	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16068WAI026	03/16/2016 01:00	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16068WAI026	03/09/2016 02:15	Sherry L Morrow	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16067A94A	03/08/2016 17:00	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16067A94A	03/08/2016 17:00	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270924
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 12:40 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM3

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	160700024A	03/14/2016 17:30	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	160700024A	03/11/2016 09:30	Bradley W VanLeuven	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-5 Grab Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270925
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 13:27 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM5

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	4.5	0.50	1.0	1
10335	Ethylbenzene	100-41-4	24	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	2.8	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	13	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	0.050	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	0.050	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	0.050	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	0.050	1
08357	Chrysene	218-01-9	N.D.	0.010	0.050	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	0.050	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	0.050	1
08357	1-Methylnaphthalene	90-12-0	2.7	0.010	0.050	1
08357	2-Methylnaphthalene	91-57-6	2.8	0.010	0.050	1
08357	Naphthalene	91-20-3	9.9	0.030	0.060	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	4,100	250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	320	46	100	1
12899	DX HRO C24-C40	n.a.	530	100	250	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	W160751AA	03/15/2016 16:32	Nicole S Lamoreaux	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	W160751AA	03/15/2016 16:32	Nicole S Lamoreaux	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16068WAI026	03/16/2016 01:29	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16068WAI026	03/09/2016 02:15	Sherry L Morrow	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16067A94A	03/08/2016 22:32	Brett W Kenyon	5

*=This limit was used in the evaluation of the final result

Sample Description: **MW-5 Grab Water**
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270925
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016 13:27 by RB

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM5

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01146	GC VOA Water Prep	SW-846 5030B	1	16067A94A	03/08/2016 22:32	Brett W Kenyon	5
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	160700024A	03/14/2016 17:54	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	160700024A	03/11/2016 09:30	Bradley W VanLeuven	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank Water
WA-11060 COC: R215907
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8270926
LL Group # 1637355
Account # 13255

Project Name: WA-11060

Collected: 03/02/2016

Submitted: 03/04/2016 09:45
Reported: 03/23/2016 12:47

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSTB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		ug/l	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1

General Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16067A94A	03/08/2016 13:35	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16067A94A	03/08/2016 13:35	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1637355
Reported: 03/23/2016 12:47

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: N160702AA	Sample number(s): 8270921-8270922,8270924		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: W160751AA	Sample number(s): 8270923,8270925		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: 16068WAI026	Sample number(s): 8270921-8270925		
Benzo(a)anthracene	N.D.	0.010	0.050
Benzo(a)pyrene	N.D.	0.010	0.050
Benzo(b)fluoranthene	N.D.	0.010	0.050
Benzo(k)fluoranthene	N.D.	0.010	0.050
Chrysene	N.D.	0.010	0.050
Dibenz(a,h)anthracene	N.D.	0.010	0.050
Indeno(1,2,3-cd)pyrene	N.D.	0.010	0.050
1-Methylnaphthalene	N.D.	0.010	0.050
2-Methylnaphthalene	N.D.	0.010	0.050
Naphthalene	N.D.	0.030	0.060
Batch number: 16067A94A	Sample number(s): 8270921,8270924-8270926		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 16069A94A	Sample number(s): 8270922-8270923		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 160700024A	Sample number(s): 8270921-8270925		
DX DRO C12-C24	N.D.	45	100
DX HRO C24-C40	N.D.	100	250

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: N160702AA	Sample number(s): 8270921-8270922,8270924								
Benzene	20	20.89			104		78-120		
Ethylbenzene	20	21.18			106		78-120		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 03/23/2016 12:47

Group Number: 1637355

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Methyl Tertiary Butyl Ether	20	19.23			96		75-120		
Toluene	20	21.3			106		80-120		
Xylene (Total)	60	63.69			106		80-120		
Batch number: W160751AA	Sample number(s): 8270923,8270925								
Benzene	20	18.76	20	18.61	94	93	78-120	1	30
Ethylbenzene	20	19.14	20	18.75	96	94	78-120	2	30
Methyl Tertiary Butyl Ether	20	16.54	20	16.74	83	84	75-120	1	30
Toluene	20	18.56	20	18.86	93	94	80-120	2	30
Xylene (Total)	60	57.36	60	56.66	96	94	80-120	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16068WAI026	Sample number(s): 8270921-8270925								
Benzo(a)anthracene	1.00	0.957			96		71-118		
Benzo(a)pyrene	1.00	0.942			94		70-120		
Benzo(b)fluoranthene	1.00	0.990			99		76-132		
Benzo(k)fluoranthene	1.00	0.947			95		69-126		
Chrysene	1.00	0.930			93		66-119		
Dibenz(a,h)anthracene	1.00	0.978			98		47-136		
Indeno(1,2,3-cd)pyrene	1.00	0.951			95		52-134		
1-Methylnaphthalene	1.00	0.940			94		68-112		
2-Methylnaphthalene	1.00	0.903			90		59-124		
Naphthalene	1.00	0.931			93		61-112		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16067A94A	Sample number(s): 8270921,8270924-8270926								
NWTPH-Gx water C7-C12	1100	1002.2			91		79-120		
Batch number: 16069A94A	Sample number(s): 8270922-8270923								
NWTPH-Gx water C7-C12	1100	965.37	1100	954.86	88	87	79-120	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 160700024A	Sample number(s): 8270921-8270925								
DX DRO C12-C24	600	370.78	600	320.44	62	53	32-115	15	20

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: N160702AA	Sample number(s): 8270921-8270922,8270924 UNSPK: P271614									
Benzene	N.D.	20	20.97	20	22.95	105	115	78-120	9	30
Ethylbenzene	N.D.	20	21.54	20	23.41	108	117	78-120	8	30
Methyl Tertiary Butyl Ether	N.D.	20	19.07	20	20.86	95	104	75-120	9	30
Toluene	N.D.	20	21.17	20	23.37	106	117	80-120	10	30
Xylene (Total)	N.D.	60	63.75	60	69.93	106	117	80-120	9	30
Batch number: W160751AA	Sample number(s): 8270923,8270925 UNSPK: P275202									
Benzene	665.1	400	1089.04	400	1093.12	106	107	78-120	0	30

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Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 03/23/2016 12:47

Group Number: 1637355

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Ethylbenzene	1079.84	400	1563.54	400	1570.85	121*	123*	78-120	0	30
Methyl Tertiary Butyl Ether	N.D.	400	350.57	400	334.75	88	84	75-120	5	30
Toluene	12.75	400	394.18	400	397.52	95	96	80-120	1	30
Xylene (Total)	504.61	1200	1764.01	1200	1762.7	105	105	80-120	0	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 16068WAI026	Sample number(s): 8270921-8270925 UNSPK: P271614									
Benzo(a)anthracene	N.D.	1.01	0.995	1.08	1.02	98	95	71-118	3	30
Benzo(a)pyrene	N.D.	1.01	0.900	1.08	0.906	89	84	70-120	1	30
Benzo(b)fluoranthene	N.D.	1.01	0.947	1.08	0.918	94	85	76-132	3	30
Benzo(k)fluoranthene	N.D.	1.01	0.855	1.08	0.893	84	83	69-126	4	30
Chrysene	N.D.	1.01	0.900	1.08	0.951	89	88	66-119	6	30
Dibenz(a,h)anthracene	N.D.	1.01	0.935	1.08	0.923	92	86	47-136	1	30
Indeno(1,2,3-cd)pyrene	N.D.	1.01	0.897	1.08	0.894	89	83	52-134	0	30
1-Methylnaphthalene	73.31	1.01	76.33	1.08	68.27	298 (2)	-467 (2)	68-112	11	30
2-Methylnaphthalene	0.0779	1.01	0.961	1.08	0.980	87	84	59-124	2	30
Naphthalene	N.D.	1.01	2.61	1.08	2.47	258*	229*	61-112	6	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 16067A94A	Sample number(s): 8270921,8270924-8270926 UNSPK: P271614									
NWTPH-Gx water C7-C12	762.51	1100	1939.76	1100	1828.92	107	97	79-120	6	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: N160702AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8270921	99	100	102	103
8270922	100	103	99	97
8270924	99	101	99	96
Blank	99	102	100	96
LCS	99	100	102	100
MS	100	100	101	99
MSD	99	101	101	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: W160751AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8270923	101	101	98	93
8270925	101	100	96	95
Blank	101	106	97	90
LCS	98	101	96	94
LCSD	100	99	99	97
MS	100	103	102	81

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1637355
Reported: 03/23/2016 12:47

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
MSD	96	102	94	97
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 16068WAI026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8270921	98	96	87
8270922	97	91	88
8270923	106	100	111
8270924	98	98	89
8270925	98	68	91
Blank	110	103	88
LCS	105	101	90
MS	115	98	97
MSD	118	92	95
Limits:	50-133	41-137	43-126

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16067A94A

	Trifluorotoluene-F
8270921	85
8270924	76
8270925	88
8270926	75
Blank	75
LCS	87
MS	89
MSD	84
Limits:	63-135

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16069A94A

	Trifluorotoluene-F
8270922	87
8270923	106
Blank	75
LCS	86
LCSD	87
Limits:	63-135

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 160700024A

	Orthoterphenyl
8270921	111
8270922	96
8270923	97
8270924	109
8270925	106
Blank	106

*- Outside of specification
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1637355
Reported: 03/23/2016 12:47

	Orthoterphenyl
LCS	106
LCSD	100
Limits:	50-150

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
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(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

13255 | 1637355 | 8270921 - 26

bp rm **Laboratory Management Program LaMP Chain of Custody Record** R215907

Page 1 of 1

BP Site Node Path: _____ Req Due Date (mm/dd/yy): STAT Rush TAT: Yes ___ No X

BP Facility No: 11060 Lab Work Order Number: _____

Lab Name: Eurofins Lancaster Labs Environmental	Facility Address: 4580 Fauntleroy Way SW	Consultant/Contractor: ARCADIS
Lab Address: 2425 New Holland Pike, Lancaster, PA 17601	City, State, ZIP Code: Seattle, WA 98126	Consultant/Contractor Project No: GP09BPNA.WA48
Lab PM: Stacy Hess	Lead Regulatory Agency: Ecology	Address: 1100 Olive Way, Suite 800, Seattle, WA 98101
Lab Phone: 717-556-7236	California Global ID No.:	Consultant/Contractor PM: Brian Marcum
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 503-220-8201 x1137 Email: brian.marcum@arcadis.com
Lab Bottle Order No:	Accounting Mode: Provision ___ OOC-BU ___ OOC-RM ___	Email EDD To: ryan.brauchla@arcadis.com richard.rodriguez@arcadis.com and to lab.enfosdoc@bp.com
Other Info:	Stage: Activity:	Invoice To: BP ___ Contractor X

BP Project Manager (PM):		
BP PM Phone:		
BP PM Email:		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Container:	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: GRO by NWTPH-Gx	DRO/HO by NWTPH-Dx	BTEX/MTBE by 8260B	cPAHs/Naphthalenes by 8270C SIM
	GMW-1	3-2-16	1200		X			10	2			8		X	X	X	X
	MW-1	3-2-16	1140		X			10	2			8		X	X	X	X
	MW-2	3-2-16	1310		X			10	2			8		X	X	X	X
	MW-3	3-2-16	1240		X			10	2			8		X	X	X	X
	MW-5	3-2-16	1327		X			10	2			8		X	X	X	X
	Trip Blank	—	—		X			2				2		X			

Report Type & QC Level: Standard X; Full Data Package ___

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Ryan Brauchla (RB)	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: ARCADIS	Ryan Brauchla / ARCADIS	3/3/16	11:18	[illegible] / OCLE	3/3/16	11:18
Shipment Method: Ship Date:						
Shipment Tracking No:				[illegible] / ELLE	3.4.16	945

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 1.6-1.7 °F/C | Trip Blank: (Yes) / No | MS/MSD Sample Submitted: Yes / (No)

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Sample Administration Receipt Documentation Log

Doc Log ID: 138367

Group Number(s): 1637355

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	SeaTac	Arrival Timestamp:	03/04/2016 9:45
Number of Packages:	2	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Timothy Cubberley (6520) at 11:44 on 03/04/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.6	DT	Wet	Y	Bagged	N
2	DT131	1.7	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: June 20, 2016

Project: WA-11060

Submittal Date: 06/08/2016
Group Number: 1669437
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
MW-6 Water	8414899
GMW-1 Water	8414900
MW-2 Water	8414901
MW-3 Water	8414902
MW-5 Water	8414903
DUP-1 Water	8414904
Trip Blank Water	8414905

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	Atlantic Richfield c/o ARCADIS	Attn: Ophelie Encelle
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

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Respectfully Submitted,

Stacy L. Butt
Specialist

(717) 556-7236

Project Name: WA-11060
LL Group #: 1669437

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260B, GC/MS Volatiles

Sample #s: 8414901, 8414904
Reporting limits were raised due to interference from the sample matrix.

SW-846 8270C SIM, GC/MS Semivolatiles

Sample #s: 8414904
The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.

Batch #: 16161WAI026 (Sample number(s): 8414899-8414904)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8414904

ECY 97-602 NWTPH-Gx, GC Volatiles

Batch #: 16166B53A (Sample number(s): 8414899-8414902, 8414905)

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8414900

Sample Description: MW-6 Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414899
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016 10:50 by EK

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM6

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	1-Methylnaphthalene	90-12-0	N.D.	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	N.D.	0.010	0.051	1
08357	Naphthalene	91-20-3	N.D.	0.031	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.	46	100	1
12899	DX HRO C24-C40	n.a.	N.D.	100	260	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P161662AA	06/14/2016 16:44	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P161662AA	06/14/2016 16:44	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16161WAI026	06/15/2016 20:05	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16161WAI026	06/10/2016 09:00	Jessica M Cook	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16166B53A	06/16/2016 03:28	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16166B53A	06/16/2016 03:28	Marie D Beamenderfer	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	161630008A	06/14/2016 18:30	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	161630008A	06/13/2016 08:00	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: GMW-1 Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414900
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016 11:15 by EK

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSG1

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	5.3	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	4.0	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		ug/l	ug/l	ug/l	
08357	1-Methylnaphthalene	90-12-0	0.53	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	1.1	0.010	0.051	1
08357	Naphthalene	91-20-3	2.2	0.030	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		ug/l	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	3,300	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		ug/l	ug/l	ug/l	
12899	DX DRO C12-C24	n.a.	130	46	100	1
12899	DX HRO C24-C40	n.a.	N.D.	100	250	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P161662AA	06/14/2016 17:10	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P161662AA	06/14/2016 17:10	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16161WAI026	06/15/2016 20:36	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16161WAI026	06/10/2016 09:00	Jessica M Cook	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16166B53A	06/16/2016 03:55	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16166B53A	06/16/2016 03:55	Marie D Beamenderfer	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	161630008A	06/14/2016 18:53	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	161630008A	06/13/2016 08:00	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-2 Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414901
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016 11:45 by EK

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM2

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	43		1.0	2.0	2
10335	Ethylbenzene	100-41-4	92		1.0	2.0	2
10335	Methyl Tertiary Butyl Ether	1634-04-4	1.1	J	1.0	2.0	2
10335	Toluene	108-88-3	4.9		1.0	2.0	2
10335	Xylene (Total)	1330-20-7	21		1.0	2.0	2
Reporting limits were raised due to interference from the sample matrix.							
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	1-Methylnaphthalene	90-12-0	2.5		0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	0.29		0.010	0.051	1
08357	Naphthalene	91-20-3	4.6		0.031	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	5,000		250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	880		46	100	1
12899	DX HRO C24-C40	n.a.	790		100	260	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	N161684AA	06/17/2016 05:20	Kevin Kelly	2
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N161684AA	06/17/2016 05:20	Kevin Kelly	2
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16161WAI026	06/15/2016 21:07	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16161WAI026	06/10/2016 09:00	Jessica M Cook	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16166B53A	06/16/2016 07:35	Marie D Beamenderfer	5
01146	GC VOA Water Prep	SW-846 5030B	1	16166B53A	06/16/2016 07:35	Marie D Beamenderfer	5
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	161630008A	06/14/2016 20:02	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	161630008A	06/13/2016 08:00	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3 Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414902
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016 12:25 by EK

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM3

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	1.4		0.50	1.0	1
10335	Ethylbenzene	100-41-4	0.78	J	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	1-Methylnaphthalene	90-12-0	0.032	J	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	N.D.		0.010	0.051	1
08357	Naphthalene	91-20-3	N.D.		0.031	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	500		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	110		46	100	1
12899	DX HRO C24-C40	n.a.	180	J	100	250	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P161662AA	06/14/2016 18:28	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P161662AA	06/14/2016 18:28	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16161WAI026	06/15/2016 21:38	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16161WAI026	06/10/2016 09:00	Jessica M Cook	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16166B53A	06/16/2016 04:23	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16166B53A	06/16/2016 04:23	Marie D Beamenderfer	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	161630008A	06/14/2016 20:25	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	161630008A	06/13/2016 08:00	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-5 Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414903
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016 13:00 by EK

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSM5

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	6.9	0.50	1.0	1
10335	Ethylbenzene	100-41-4	23	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	4.4	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	15	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		ug/l	ug/l	ug/l	
08357	1-Methylnaphthalene	90-12-0	2.3	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	2.3	0.010	0.051	1
08357	Naphthalene	91-20-3	7.3	0.031	0.061	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		ug/l	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	5,300	250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		ug/l	ug/l	ug/l	
12899	DX DRO C12-C24	n.a.	310	46	100	1
12899	DX HRO C24-C40	n.a.	620	100	260	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P161662AA	06/14/2016 18:55	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P161662AA	06/14/2016 18:55	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16161WAI026	06/15/2016 22:09	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16161WAI026	06/10/2016 09:00	Jessica M Cook	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16168A53A	06/18/2016 02:36	Marie D Beamenderfer	5
01146	GC VOA Water Prep	SW-846 5030B	1	16168A53A	06/18/2016 02:36	Marie D Beamenderfer	5
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	161630008A	06/14/2016 20:48	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	161630008A	06/13/2016 08:00	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414904
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016 by EK

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSD1

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	28	1.0	2.0	2
10335	Ethylbenzene	100-41-4	94	1.0	2.0	2
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	1.0	2.0	2
10335	Toluene	108-88-3	5.3	1.0	2.0	2
10335	Xylene (Total)	1330-20-7	26	1.0	2.0	2
	Reporting limits were raised due to interference from the sample matrix.					
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	1-Methylnaphthalene	90-12-0	1.9	0.010	0.051	1
08357	2-Methylnaphthalene	91-57-6	0.17	0.010	0.051	1
08357	Naphthalene	91-20-3	4.5	0.030	0.061	1
	The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.					
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	4,900	250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	1,300	46	100	1
12899	DX HRO C24-C40	n.a.	810	100	260	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P161662AA	06/14/2016 19:47	Daniel H Heller	2
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P161662AA	06/14/2016 19:47	Daniel H Heller	2
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16161WAI026	06/15/2016 22:40	Catherine E Bachman	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16161WAI026	06/10/2016 09:00	Jessica M Cook	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16168A53A	06/18/2016 03:03	Marie D Beamenderfer	5
01146	GC VOA Water Prep	SW-846 5030B	1	16168A53A	06/18/2016 03:03	Marie D Beamenderfer	5
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	161680030A	06/20/2016 11:15	Christine E Dolman	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	161680030A	06/17/2016 08:00	Kayla Yuditsky	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank Water
WA-11060 COC: R215933
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8414905
LL Group # 1669437
Account # 13255

Project Name: WA-11060

Collected: 06/06/2016

Submitted: 06/08/2016 09:45
Reported: 06/20/2016 15:35

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

FWSTB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC Volatiles	**ECY 97-602 NWTPH-Gx**		ug/l	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16166B53A	06/15/2016 23:19	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	16166B53A	06/15/2016 23:19	Marie D Beamenderfer	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1669437
Reported: 06/20/2016 15:35

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: N161684AA	Sample number(s): 8414901		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: P161662AA	Sample number(s): 8414899-8414900,8414902-8414904		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: 16161WAI026	Sample number(s): 8414899-8414904		
1-Methylnaphthalene	N.D.	0.010	0.050
2-Methylnaphthalene	N.D.	0.010	0.050
Naphthalene	N.D.	0.030	0.060
Batch number: 16166B53A	Sample number(s): 8414899-8414902,8414905		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 16168A53A	Sample number(s): 8414903-8414904		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 161630008A	Sample number(s): 8414899-8414903		
DX DRO C12-C24	N.D.	45	100
DX HRO C24-C40	N.D.	100	250
Batch number: 161680030A	Sample number(s): 8414904		
DX DRO C12-C24	N.D.	45	100
DX HRO C24-C40	N.D.	100	250

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: N161684AA	Sample number(s): 8414901								
Benzene	20	21.52	20	21.27	108	106	78-120	1	30
Ethylbenzene	20	19.41	20	19.43	97	97	78-120	0	30
Methyl Tertiary Butyl Ether	20	20.68	20	20.41	103	102	75-120	1	30
Toluene	20	19.3	20	19.23	96	96	80-120	0	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1669437
Reported: 06/20/2016 15:35

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Xylene (Total)	60	57.22	60	57.02	95	95	80-120	0	30
Batch number: P161662AA	Sample number(s): 8414899-8414900,8414902-8414904								
Benzene	20	19.04			95		78-120		
Ethylbenzene	20	17.63			88		78-120		
Methyl Tertiary Butyl Ether	20	18.17			91		75-120		
Toluene	20	18.55			93		80-120		
Xylene (Total)	60	55.73			93		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16161WAI026	Sample number(s): 8414899-8414904								
1-Methylnaphthalene	1.00	0.939	1.00	0.912	94	91	68-112	3	30
2-Methylnaphthalene	1.00	0.941	1.00	0.914	94	91	59-124	3	30
Naphthalene	1.00	0.916	1.00	0.898	92	90	61-112	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16166B53A	Sample number(s): 8414899-8414902,8414905								
NWTPH-Gx water C7-C12	1100	1105.9	1100	1066.8	101	97	79-120	4	30
Batch number: 16168A53A	Sample number(s): 8414903-8414904								
NWTPH-Gx water C7-C12	1100	983.75	1100	1037.75	89	94	79-120	5	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 161630008A	Sample number(s): 8414899-8414903								
DX DRO C12-C24	600	389.67	600	428.66	65	71	32-115	10	20
Batch number: 161680030A	Sample number(s): 8414904								
DX DRO C12-C24	600	421.87	600	399.6	70	67	32-115	5	20

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: P161662AA	Sample number(s): 8414899-8414900,8414902-8414904 UNSPK: P414883									
Benzene	N.D.	20	21.16	20	20.73	106	104	78-120	2	30
Ethylbenzene	N.D.	20	19.89	20	19.75	99	99	78-120	1	30
Methyl Tertiary Butyl Ether	N.D.	20	19.21	20	18.88	96	94	75-120	2	30
Toluene	N.D.	20	20.63	20	20.02	103	100	80-120	3	30
Xylene (Total)	N.D.	60	61.83	60	61.03	103	102	80-120	1	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1669437
Reported: 06/20/2016 15:35

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: N161684AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8414901	108	103	96	100
Blank	108	104	95	98
LCS	107	103	97	103
LCSD	107	99	97	102
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: P161662AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8414899	97	103	103	104
8414900	98	102	100	105
8414902	98	104	101	104
8414903	98	98	99	104
8414904	98	103	101	104
Blank	96	101	102	103
LCS	98	105	97	98
MS	98	107	95	97
MSD	99	107	95	97
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 16161WAI026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8414899	84	84	87
8414900	74	69	84
8414901	82	73	118
8414902	74	91	88
8414903	73	78	82
8414904	63	69	155*
Blank	92	89	89
LCS	85	91	89
LCSD	83	91	85
Limits:	50-133	41-137	43-126

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16166B53A

	Trifluorotoluene-F
8414899	112
8414900	148*
8414901	129
8414902	108
8414905	120
Blank	114

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1669437
Reported: 06/20/2016 15:35

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

	Trifluorotoluene-F
LCS	116
LCSD	111
Limits:	63-135

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16168A53A

	Trifluorotoluene-F
8414903	111
8414904	121
Blank	112
LCS	110
LCSD	109
Limits:	63-135

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 161630008A

	Orthoterphenyl
8414899	98
8414900	100
8414901	106
8414902	108
8414903	103
Blank	98
LCS	106
LCSD	114
Limits:	50-150

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 161680030A

	Orthoterphenyl
8414904	113
Blank	118
LCS	106
LCSD	108
Limits:	50-150

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

13255 | 1669437 | 8414899-905

bp rm

Laboratory Management Program LaMP Chain of Custody Record R215933

Page 1 of 1

BP Site Node Path: _____ Req Due Date (mm/dd/yy): STAT Rush TAT: Yes ___ No X

BP Facility No: 11060 Lab Work Order Number: _____

Lab Name: Eurofins Lancaster Labs Environmental	Facility Address: 4580 Fauntleroy Way	Consultant/Contractor: Arcadis
Lab Address: 2425 New Holland Pike, Lancaster, PA, 17601	City, State, ZIP Code: Seattle, WA 98124	Consultant/Contractor Project No: GP09BPNA.WA48
Lab PM: Stacy Hess	Lead Regulatory Agency: Ecology	Address: 1100 Olive Way, Suite 800, Seattle, WA
Lab Phone: 717-556-7236	California Global ID No.:	Consultant/Contractor PM: Brian Marcum
Lab Shipping Accnt:	Enfos Proposal No:	Phone: 503-220-8201 x1137 Email: brian.marcum@arcadis.com
Lab Bottle Order No:	Accounting Mode: Provision ___ OOC-BU ___ OOC-RM ___	Email EDD To: and to lab.enfosdoc@bp.com
Other Info:	Stage: Activity:	Invoice To: BP ___ Contractor X

BP Project Manager (PM):

BP PM Phone:

BP PM Email:

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Container:	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: GRO NWTPH-Gx	DRO/HO NWTPH-Dx	BTEX/MTBE 8260B	Naphthalenes 8270C SIM	Report Type & QC Level
	MW-6	6/6/16	1050		X			10	2			8						Standard X
	GMW-1	6/6/16	1115		↓			↓	↓			↓		↓	↓	↓	↓	Full Data Package ___
	MW-2	6/6/16	1145		↓			↓	↓			↓		↓	↓	↓	↓	
	MW-3	6/6/16	1225		↓			↓	↓			↓		↓	↓	↓	↓	
	MW-5	6/6/16	1300		↓			↓	↓			↓		↓	↓	↓	↓	
	DUP-1	6/6/16	—		↓			↓	↓			↓		↓	↓	↓	↓	
	Trip Blank	—	—		X			2				2		↓				

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Eric Krueger (EK)	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Arcadis	Ryan Brauchla	6/7/16	1150	[signature] / ECLE	6/7/16	11:50
Shipment Method: Ship Date:						
Shipment Tracking No:				[signature] / ECLE	6-8-16	945

Special Instructions: Any questions contact Ryan Brauchla 509-438-9828

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt 2.4 1.0 °F/C | Trip Blank: (Yes) / No | MS/MSD Sample Submitted: Yes / (No)

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Sample Administration Receipt Documentation Log

Doc Log ID: 149437

Group Number(s): 1669437

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	SeaTac	Arrival Timestamp:	06/08/2016 9:45
Number of Packages:	2	Number of Projects:	2
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Joseph Huber (7831) at 11:40 on 06/08/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.4	DT	Wet	Y	Bagged	N
2	DT121	1.0	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: September 29, 2016

Project: WA-11060

Submittal Date: 09/15/2016
Group Number: 1708706
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
GMW-1-09122016 Grab Water	8588715
MW-2-09122016 Grab Water	8588716
MW-3-09122016 Grab Water	8588717
MW-6-09122016 Grab Water	8588718
MW-9-09122016 Grab Water	8588719
MW-10-09122016 Grab Water	8588720
BD-11060-09122016 Grab Water	8588721

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ryan Brauchla
Electronic Copy To	Atlantic Richfield c/o ARCADIS	Attn: Ophelie Encelle
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

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Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1708706

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8270C SIM, GC/MS Semivolatiles

Sample #s: 8588718

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Sufficient sample was not available to repeat the analysis.

Sample #s: 8588715, 8588717, 8588719, 8588720, 8588721

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

Batch #: 16263WAA026 (Sample number(s): 8588715, 8588717-8588721)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD were below the acceptance window: 2-Methylnaphthalene

Sample Description: GMW-1-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588715
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 11:00

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45801

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	32	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	34	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.0095	0.047	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.0095	0.047	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.0095	0.047	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.0095	0.047	1
08357	Chrysene	218-01-9	N.D.	0.0095	0.047	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.0095	0.047	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.0095	0.047	1
08357	1-Methylnaphthalene	90-12-0	1.4	0.0095	0.047	1
08357	2-Methylnaphthalene	91-57-6	2.8	0.0095	0.047	1
08357	Naphthalene	91-20-3	6.8	0.028	0.057	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.					
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	4,600	250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	210	29	96	1
08271	Heavy Range Organics C24-C40	n.a.	N.D.	67	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162652AA	09/21/2016 12:48	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162652AA	09/21/2016 12:48	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16263WAA026	09/20/2016 12:25	Joseph M Gambler	1

*=This limit was used in the evaluation of the final result

Sample Description: GMW-1-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588715
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 11:00

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45801

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16263WAA026	09/19/2016 22:45	Nicholas W Shroyer	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16266A20A	09/22/2016 17:55	Brett W Kenyon	5
01146	GC VOA Water Prep	SW-846 5030B	1	16266A20A	09/22/2016 17:55	Brett W Kenyon	5
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 00:30	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-2-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588716
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 13:15

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45802

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	130	0.50	1.0	1
10335	Ethylbenzene	100-41-4	83	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	2.2	0.50	1.0	1
10335	Toluene	108-88-3	6.5	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	20	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	5,000	500	2,500	10
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	710	29	97	1
08271	Heavy Range Organics C24-C40	n.a.	660	68	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162661AA	09/22/2016 11:17	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162661AA	09/22/2016 11:17	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16266A20A	09/22/2016 18:23	Brett W Kenyon	10
01146	GC VOA Water Prep	SW-846 5030B	1	16266A20A	09/22/2016 18:23	Brett W Kenyon	10
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 00:51	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588717
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 11:30

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45803

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	4.3	0.50	1.0	1
10335	Ethylbenzene	100-41-4	2.1	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.0095	0.048	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.0095	0.048	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.0095	0.048	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.0095	0.048	1
08357	Chrysene	218-01-9	N.D.	0.0095	0.048	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.0095	0.048	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.0095	0.048	1
08357	1-Methylnaphthalene	90-12-0	0.19	0.0095	0.048	1
08357	2-Methylnaphthalene	91-57-6	N.D.	0.0095	0.048	1
08357	Naphthalene	91-20-3	N.D.	0.029	0.057	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	1,200	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	100	29	96	1
08271	Heavy Range Organics C24-C40	n.a.	N.D.	67	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162652AA	09/21/2016 13:14	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162652AA	09/21/2016 13:14	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16263WAA026	09/20/2016 12:58	Joseph M Gambler	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588717
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 11:30

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45803

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16263WAA026	09/19/2016 22:45	Nicholas W Shroyer	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16266A20A	09/22/2016 12:25	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16266A20A	09/22/2016 12:25	Brett W Kenyon	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 01:13	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-6-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588718
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 10:30

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45804

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**	**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.	0.0095	0.047	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.0095	0.047	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.0095	0.047	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.0095	0.047	1
08357	Chrysene	218-01-9	N.D.	0.0095	0.047	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.0095	0.047	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.0095	0.047	1
08357	1-Methylnaphthalene	90-12-0	N.D.	0.0095	0.047	1
08357	2-Methylnaphthalene	91-57-6	N.D.	0.0095	0.047	1
08357	Naphthalene	91-20-3	N.D.	0.028	0.057	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Sufficient sample was not available to repeat the analysis.					
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	140	29	96	1
08271	Heavy Range Organics C24-C40	n.a.	280	67	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162652AA	09/21/2016 13:40	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162652AA	09/21/2016 13:40	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16263WAA026	09/20/2016 13:33	Joseph M Gambler	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16263WAA026	09/19/2016 22:45	Nicholas W Shroyer	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-6-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588718
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 10:30

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45804

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16264B53A	09/21/2016 18:00	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	16264B53A	09/21/2016 18:00	Jeremy C Giffin	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 01:35	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588719
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 14:00

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45805

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.0095	0.047	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.0095	0.047	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.0095	0.047	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.0095	0.047	1
08357	Chrysene	218-01-9	N.D.		0.0095	0.047	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.0095	0.047	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.0095	0.047	1
08357	1-Methylnaphthalene	90-12-0	N.D.		0.0095	0.047	1
08357	2-Methylnaphthalene	91-57-6	N.D.		0.0095	0.047	1
08357	Naphthalene	91-20-3	N.D.		0.028	0.057	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.						
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	190		29	96	1
08271	Heavy Range Organics C24-C40	n.a.	170	J	67	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162652AA	09/21/2016 14:06	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162652AA	09/21/2016 14:06	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16263WAA026	09/20/2016 14:06	Joseph M Gambler	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-9-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588719
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 14:00

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45805

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16263WAA026	09/19/2016 22:45	Nicholas W Shroyer	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16264B53A	09/21/2016 18:28	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	16264B53A	09/21/2016 18:28	Jeremy C Giffin	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 01:56	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-10-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588720
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 12:10

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45806

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.0095	0.048	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.0095	0.048	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.0095	0.048	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.0095	0.048	1
08357	Chrysene	218-01-9	N.D.		0.0095	0.048	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.0095	0.048	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.0095	0.048	1
08357	1-Methylnaphthalene	90-12-0	N.D.		0.0095	0.048	1
08357	2-Methylnaphthalene	91-57-6	N.D.		0.0095	0.048	1
08357	Naphthalene	91-20-3	N.D.		0.029	0.057	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.						
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	130	J	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	N.D.		29	97	1
08271	Heavy Range Organics C24-C40	n.a.	N.D.		68	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162661AA	09/22/2016 12:08	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162661AA	09/22/2016 12:08	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16263WAA026	09/20/2016 14:40	Joseph M Gambler	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-10-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588720
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016 12:10

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45806

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16263WAA026	09/19/2016 22:45	Nicholas W Shroyer	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16264B53A	09/21/2016 18:55	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	16264B53A	09/21/2016 18:55	Jeremy C Giffin	1
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 02:18	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Sample Description: BD-11060-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588721
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45807

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	32		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	34		0.50	1.0	1
GC/MS Semivolatiles	**SW-846 8270C SIM**		**ug/l**		**ug/l**	**ug/l**	
08357	Benzo(a)anthracene	56-55-3	N.D.		0.0095	0.048	1
08357	Benzo(a)pyrene	50-32-8	N.D.		0.0095	0.048	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.		0.0095	0.048	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.		0.0095	0.048	1
08357	Chrysene	218-01-9	N.D.		0.0095	0.048	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.		0.0095	0.048	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.0095	0.048	1
08357	1-Methylnaphthalene	90-12-0	1.4		0.0095	0.048	1
08357	2-Methylnaphthalene	91-57-6	2.8		0.0095	0.048	1
08357	Naphthalene	91-20-3	7.1		0.029	0.057	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken: The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. Similar results were obtained in both trials.

GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	4,400		250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
08271	Diesel Range Organics C12-C24	n.a.	310		29	96	1
08271	Heavy Range Organics C24-C40	n.a.	120	J	67	240	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P162661AA	09/22/2016 12:34	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P162661AA	09/22/2016 12:34	Daniel H Heller	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	16263WAA026	09/20/2016 17:01	Joseph M Gambler	1

*=This limit was used in the evaluation of the final result

Sample Description: BD-11060-09122016 Grab Water
WA-11060 COC:
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8588721
LL Group # 1708706
Account # 13255

Project Name: WA-11060

Collected: 09/12/2016

Submitted: 09/15/2016 09:40
Reported: 09/29/2016 10:21

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

45807

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	16263WAA026	09/19/2016 22:45	Nicholas W Shroyer	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16266A20A	09/22/2016 18:51	Brett W Kenyon	5
01146	GC VOA Water Prep	SW-846 5030B	1	16266A20A	09/22/2016 18:51	Brett W Kenyon	5
08271	NWTPH-Dx water	ECY 97-602 NWTPH-Dx modified	1	162610018A	09/20/2016 02:40	Christine E Dolman	1
11197	WA DRO NW DX Ext (Non SG)	ECY 97-602 NWTPH-Dx 06/97	1	162610018A	09/19/2016 09:00	Jessica M Cook	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1708706
Reported: 09/29/2016 10:21

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: P162652AA	Sample number(s): 8588715,8588717-8588719		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: P162661AA	Sample number(s): 8588716,8588720-8588721		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: 16263WAA026	Sample number(s): 8588715,8588717-8588721		
Benzo(a)anthracene	N.D.	0.010	0.050
Benzo(a)pyrene	N.D.	0.010	0.050
Benzo(b)fluoranthene	N.D.	0.010	0.050
Benzo(k)fluoranthene	N.D.	0.010	0.050
Chrysene	N.D.	0.010	0.050
Dibenz(a,h)anthracene	N.D.	0.010	0.050
Indeno(1,2,3-cd)pyrene	N.D.	0.010	0.050
1-Methylnaphthalene	N.D.	0.010	0.050
2-Methylnaphthalene	N.D.	0.010	0.050
Naphthalene	N.D.	0.030	0.060
Batch number: 16264B53A	Sample number(s): 8588718-8588720		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 16266A20A	Sample number(s): 8588715-8588717,8588721		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 162610018A	Sample number(s): 8588715-8588721		
Diesel Range Organics C12-C24	N.D.	30	100
Heavy Range Organics C24-C40	N.D.	70	250

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: P162652AA	Sample number(s): 8588715,8588717-8588719								

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Group Number: 1708706
Reported: 09/29/2016 10:21

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Benzene	20	21.28	20	20.95	106	105	78-120	2	30
Ethylbenzene	20	19.78	20	19.34	99	97	78-120	2	30
Methyl Tertiary Butyl Ether	20	19.56	20	19.56	98	98	75-120	0	30
Toluene	20	20.72	20	20.38	104	102	80-120	2	30
Xylene (Total)	60	60.99	60	60.21	102	100	80-120	1	30
Batch number: P162661AA	Sample number(s): 8588716,8588720-8588721								
Benzene	20	19.74	20	19.12	99	96	78-120	3	30
Ethylbenzene	20	18.62	20	18.18	93	91	78-120	2	30
Methyl Tertiary Butyl Ether	20	18.93	20	18.42	95	92	75-120	3	30
Toluene	20	19.19	20	18.78	96	94	80-120	2	30
Xylene (Total)	60	57.48	60	56.45	96	94	80-120	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16263WAA026	Sample number(s): 8588715,8588717-8588721								
Benzo(a)anthracene	1.00	1.03	1.00	0.995	103	99	66-111	4	30
Benzo(a)pyrene	1.00	1.00	1.00	0.996	100	100	66-111	1	30
Benzo(b)fluoranthene	1.00	1.07	1.00	1.04	107	104	69-117	3	30
Benzo(k)fluoranthene	1.00	0.931	1.00	0.942	93	94	65-111	1	30
Chrysene	1.00	1.01	1.00	0.994	101	99	66-105	1	30
Dibenz(a,h)anthracene	1.00	1.00	1.00	0.997	100	100	52-122	1	30
Indeno(1,2,3-cd)pyrene	1.00	0.937	1.00	0.933	94	93	55-115	0	30
1-Methylnaphthalene	1.00	0.714	1.00	0.678	71	68	68-112	5	30
2-Methylnaphthalene	1.00	0.673	1.00	0.629	67	63*	66-109	7	30
Naphthalene	1.00	0.705	1.00	0.672	71	67	61-112	5	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16264B53A	Sample number(s): 8588718-8588720								
NWTPH-Gx water C7-C12	1100	1089.11	1100	1054.6	99	96	79-120	3	30
Batch number: 16266A20A	Sample number(s): 8588715-8588717,8588721								
NWTPH-Gx water C7-C12	1100	1057.09	1100	1028.88	96	94	79-120	3	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 162610018A	Sample number(s): 8588715-8588721								
Diesel Range Organics C12-C24	1600	1224.28	1600	1303.93	77	81	50-113	6	20

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1708706
Reported: 09/29/2016 10:21

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: P162652AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8588715	97	104	104	109
8588717	99	103	103	109
8588718	100	107	105	104
8588719	99	106	104	106
Blank	98	103	105	104
LCS	98	105	99	101
LCSD	101	109	97	101
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: P162661AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8588716	98	104	103	108
8588720	99	106	105	106
8588721	98	102	103	110
Blank	98	107	104	104
LCS	101	106	98	100
LCSD	100	107	98	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAHs in waters by SIM
Batch number: 16263WAA026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
8588715	98	80	55
8588717	86	90	59
8588718	99	78	65
8588719	94	78	68
8588720	94	69	63
8588721	96	72	56
Blank	103	102	60
LCS	105	102	69
LCSD	102	101	65
Limits:	51-128	34-130	45-119

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16264B53A

	Trifluorotoluene-F
8588718	101
8588719	101
8588720	98
Blank	100
LCS	110
LCSD	108

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1708706
Reported: 09/29/2016 10:21

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Limits: 63-135

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16266A20A

	Trifluorotoluene-F
8588715	94
8588716	103
8588717	110
8588721	96
Blank	88
LCS	96
LCSD	95
Limits:	63-135

Analysis Name: NWTPH-Dx water
Batch number: 162610018A

	Orthoterphenyl
8588715	97
8588716	100
8588717	95
8588718	80
8588719	99
8588720	96
8588721	91
Blank	104
LCS	106
LCSD	113
Limits:	50-150

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

13255 / 1708706 / 8588715-22

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	ARCADIS	Report To:	Ryan Brauchla	Attention:	Ryan Brauchla
Address:	1100 Olive Way Suite 800	Copy To:		Company Name:	ARCADIS
	Seattle, WA 98101			Address:	1100 Olive Way Ste. 800, Seattle, WA 98101
Email To:	ryan.brauchla@arcadis-us.com	Purchase Order No.		Lancaster Quote Reference:	
Phone:	206-726-4720 Fax 206-325-8218	Client Project ID:	ARCO 11060	Lancaster Project Manager:	Stacy Butt
Requested Due Date/TAT:	10 Day (Default)	Project Number:	GP09BPNA.WA48.N0000	Lancaster Profile #:	

Regulatory Agency
Washington State Department of Ecology
State / Location
WA

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; TS

ITEM#	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	GRO (NWTPH-Gx)	MTBE/BTEX (8260B)	DRO/HO (NWTPH-Dx) - WITHOUT SGC	cPAHs / Total Naphthalenes (8270C SIM)	**Dissolved Lead (6010)	Total Lead (6010)	Residual Chlorine (Y/N)	** Dissolved lead to be lab filtered. Collected in NP bottle.
	GMW-1-09122016	WT	6			9/12/16	1100		10	X			X						X	X	X	X				
	MW-2-09122016	WT	6				1315		7				X						X	X	X	X				LINCED VOLUME
	MW-3-09122016	WT	6				1130		10	X			X						X	X	X	X				
	MW-6-09122016	WT	6				1030		9	X			X						X	X	X	X				
	MW-9-09122016	WT	6				1400		10	X			X						X	X	X	X				
	MW-10-09122016	WT	6				1210		10	X			X						X	X	X	X				
	BD-11060-09122016	WT	6				—		10	X			X						Y	X	X	Y				
	TB-11060-09122016	WT	6				1000		2				X						X	X						ON HOLD

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
		9/12/16			9/14/16	16:00				
				ELLE	9.15.16	940	08-26	X	X	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: LEE BURES

SIGNATURE of SAMPLER:

DATE Signed: 9/12/16

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 162154

Group Number(s): 1708706

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	09/15/2016 9:40
Number of Packages:	4	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Timothy Cubberley (6520) at 12:33 on 09/15/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.1	DT	Wet	Y	Bagged	N
2	DT131	0.8	DT	Wet	Y	Bagged	N
3	DT131	1.3	DT	Wet	Y	Bagged	N
4	DT131	3.0	DT	Wet	Y	Bagged	N

2425 New Holland Pike
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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: January 12, 2017

Project: WA-11060

Submittal Date: 12/14/2016
Group Number: 1745121
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
GMW-1 Water	8747659
MW-2 Water	8747660
MW-3 Water	8747661
MW-4 Water	8747662
MW-5 Water	8747663
MW-6 Water	8747664
DUP-1 Water	8747665
Trip Blank Water	8747666

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Atlantic Richfield c/o ARCADIS	Attn: Ophelie Encelle
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ryan Brauchla

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Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1745121

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

SW-846 8260B, GC/MS Volatiles

Sample #s: 8747662
Reporting limits were raised due to interference from the sample matrix.

ECY 97-602 NWTPH-Dx modified, GC Petroleum Hydrocarbons

Sample #s: 8747659, 8747660, 8747661, 8747662, 8747663, 8747664
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample #s: 8747665
The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. The results for the second trial are DX DRO C12-24 540 ug/l and DX HRO C24-C40 non-detect.

Batch #: 163560018A (Sample number(s): 8747659-8747663)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD were below the acceptance window: DX DRO C12-C24

Batch #: 163570036A (Sample number(s): 8747664-8747665)

The recovery(ies) for the following analyte(s) in the LCS and/or LCSD were below the acceptance window: DX DRO C12-C24

The recovery(ies) for one or more surrogates were outside of the QC window for sample(s) 8747665

Sample Description: GMW-1 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747659
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 13:35 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEAG1

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	350	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.	50	110	1
12899	DX HRO C24-C40	n.a.	400	110	280	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163541AA	12/19/2016 13:01	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163541AA	12/19/2016 13:01	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16351A53A	12/16/2016 23:16	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	16351A53A	12/16/2016 23:16	Jeremy C Giffin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163560018A	12/23/2016 02:27	Thomas C Wildermuth	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163560018A	12/21/2016 17:00	Kate E Lutte	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-2 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747660
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 15:05 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEA02

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	4.1		0.50	1.0	1
10335	Ethylbenzene	100-41-4	12		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	0.74	J	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	10		0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	1,000		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	590		51	110	1
12899	DX HRO C24-C40	n.a.	N.D.		110	280	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163541AA	12/19/2016 14:18	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163541AA	12/19/2016 14:18	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16351A53A	12/16/2016 23:44	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	16351A53A	12/16/2016 23:44	Jeremy C Giffin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163560018A	12/23/2016 02:50	Thomas C Wildermuth	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163560018A	12/21/2016 17:00	Kate E Lutte	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-3 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747661
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 14:36 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEA03

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.		0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.		0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	53	J	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	210		53	120	1
12899	DX HRO C24-C40	n.a.	140	J	120	290	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163542AA	12/19/2016 14:31	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163542AA	12/19/2016 14:31	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16351A53A	12/17/2016 00:12	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	16351A53A	12/17/2016 00:12	Jeremy C Giffin	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163560018A	12/23/2016 04:21	Thomas C Wildermuth	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163560018A	12/21/2016 17:00	Kate E Lutte	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-4 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747662
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 16:20 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEA04

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	120	2.5	5.0	5
10335	Ethylbenzene	100-41-4	57	2.5	5.0	5
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	2.5	5.0	5
10335	Toluene	108-88-3	37	2.5	5.0	5
10335	Xylene (Total)	1330-20-7	1,000	2.5	5.0	5
	Reporting limits were raised due to interference from the sample matrix.					
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	25,000	1,000	5,000	20
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	2,100	48	110	1
12899	DX HRO C24-C40	n.a.	380	110	270	1
	The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.					

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163542AA	12/19/2016 14:57	Daniel H Heller	5
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163542AA	12/19/2016 14:57	Daniel H Heller	5
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16354C20A	12/19/2016 22:01	Brett W Kenyon	20
01146	GC VOA Water Prep	SW-846 5030B	1	16354C20A	12/19/2016 22:01	Brett W Kenyon	20
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163560018A	12/23/2016 04:45	Thomas C Wildermuth	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163560018A	12/21/2016 17:00	Kate E Lutte	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-5 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747663
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 15:51 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEA05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	1.7	0.50	1.0	1
10335	Ethylbenzene	100-41-4	9.0	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	1.8	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	4.5	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	4,300	250	1,300	5
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	17,000	240	540	5
12899	DX HRO C24-C40	n.a.	N.D.	540	1,300	5

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163542AA	12/19/2016 15:48	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163542AA	12/19/2016 15:48	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 19:42	Brett W Kenyon	5
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 19:42	Brett W Kenyon	5
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163560018A	12/29/2016 12:26	Thomas C Wildermuth	5
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163560018A	12/21/2016 17:00	Kate E Lutte	1

*=This limit was used in the evaluation of the final result

Sample Description: MW-6 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747664
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 14:05 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEA06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**	**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**	**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	N.D.	47	100	1
12899	DX HRO C24-C40	n.a.	N.D.	100	260	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163542AA	12/19/2016 16:40	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163542AA	12/19/2016 16:40	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16356A20A	12/21/2016 12:04	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16356A20A	12/21/2016 12:04	Brett W Kenyon	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163570036A	12/28/2016 11:58	Amy Lehr	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163570036A	12/23/2016 17:00	Ryan J Dowdy	1

*=This limit was used in the evaluation of the final result

Sample Description: DUP-1 Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747665
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016 by AP

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEAFD

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	0.80	J	0.50	1.0	1
10335	Ethylbenzene	100-41-4	6.7		0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.50	1.0	1
10335	Toluene	108-88-3	N.D.		0.50	1.0	1
10335	Xylene (Total)	1330-20-7	1.9		0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		**ug/l**		**ug/l**	**ug/l**	
08273	NWTPH-Gx water C7-C12	n.a.	1,900		50	250	1
GC Petroleum Hydrocarbons	**ECY 97-602 NWTPH-Dx modified**		**ug/l**		**ug/l**	**ug/l**	
12899	DX DRO C12-C24	n.a.	400		48	110	1
12899	DX HRO C24-C40	n.a.	860		110	270	1

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.
Target analytes were detected in the method blank associated with the samples as noted on the QC Summary. The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial. The results for the second trial are DX DRO C12-24 540 ug/l and DX HRO C24-C40 non-detect.

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163542AA	12/19/2016 17:06	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163542AA	12/19/2016 17:06	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16354C20A	12/19/2016 15:49	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16354C20A	12/19/2016 15:49	Brett W Kenyon	1
12899	DRO/DX Mini-extraction Master	ECY 97-602 NWTPH-Dx modified	1	163570036A	12/28/2016 12:21	Amy Lehr	1
12907	Mini-extraction DRO DX (water)	ECY 97-602 NWTPH-Dx 06/97	1	163570036A	12/23/2016 17:00	Ryan J Dowdy	1

*=This limit was used in the evaluation of the final result

Sample Description: Trip Blank Water
WA-11060 COC: R215977
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # WW 8747666
LL Group # 1745121
Account # 13255

Project Name: WA-11060

Collected: 12/12/2016

Submitted: 12/14/2016 08:30
Reported: 01/12/2017 09:14

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

SEATB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		ug/l	ug/l	ug/l	
10335	Benzene	71-43-2	N.D.	0.50	1.0	1
10335	Ethylbenzene	100-41-4	N.D.	0.50	1.0	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.50	1.0	1
10335	Toluene	108-88-3	N.D.	0.50	1.0	1
10335	Xylene (Total)	1330-20-7	N.D.	0.50	1.0	1
GC Volatiles	**ECY 97-602 NWTPH-Gx**		ug/l	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	250	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	VOCs 8260 BTEX/MTBE	SW-846 8260B	1	P163542AA	12/19/2016 12:48	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P163542AA	12/19/2016 12:48	Daniel H Heller	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	16354C20A	12/19/2016 12:01	Brett W Kenyon	1
01146	GC VOA Water Prep	SW-846 5030B	1	16354C20A	12/19/2016 12:01	Brett W Kenyon	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1745121
Reported: 01/12/2017 09:14

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: P163541AA	Sample number(s): 8747659-8747660		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: P163542AA	Sample number(s): 8747661-8747666		
Benzene	N.D.	0.50	1.0
Ethylbenzene	N.D.	0.50	1.0
Methyl Tertiary Butyl Ether	N.D.	0.50	1.0
Toluene	N.D.	0.50	1.0
Xylene (Total)	N.D.	0.50	1.0
Batch number: 16351A53A	Sample number(s): 8747659-8747661		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 16354C20A	Sample number(s): 8747662,8747665-8747666		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 16356A20A	Sample number(s): 8747663-8747664		
NWTPH-Gx water C7-C12	N.D.	50	250
Batch number: 163560018A	Sample number(s): 8747659-8747663		
DX DRO C12-C24	N.D.	45	100
DX HRO C24-C40	N.D.	100	250
Batch number: 163570036A	Sample number(s): 8747664-8747665		
DX DRO C12-C24	130	45	100
DX HRO C24-C40	350	100	250

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: P163541AA	Sample number(s): 8747659-8747660								
Benzene	20	20.61			103		78-120		
Ethylbenzene	20	20.96			105		78-120		
Methyl Tertiary Butyl Ether	20	21.77			109		75-120		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 01/12/2017 09:14

Group Number: 1745121

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Toluene	20	21.21			106		80-120		
Xylene (Total)	60	61.2			102		80-120		
Batch number: P163542AA	Sample number(s): 8747661-8747666								
Benzene	20	21.13			106		78-120		
Ethylbenzene	20	21.38			107		78-120		
Methyl Tertiary Butyl Ether	20	22.6			113		75-120		
Toluene	20	21.16			106		80-120		
Xylene (Total)	60	61.99			103		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16351A53A	Sample number(s): 8747659-8747661								
NWTPH-Gx water C7-C12	1100	1069.04	1100	1077.07	97	98	79-120	1	30
Batch number: 16354C20A	Sample number(s): 8747662,8747665-8747666								
NWTPH-Gx water C7-C12	1100	1056.18	1100	1051.3	96	96	79-120	0	30
Batch number: 16356A20A	Sample number(s): 8747663-8747664								
NWTPH-Gx water C7-C12	1100	999.5			91		79-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163560018A	Sample number(s): 8747659-8747663								
DX DRO C12-C24	600	300.46	600	312.64	50*	52*	70-130	4	20
Batch number: 163570036A	Sample number(s): 8747664-8747665								
DX DRO C12-C24	600	349.77	600	322.26	58*	54*	70-130	8	20

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: P163541AA	Sample number(s): 8747659-8747660 UNSPK: 8747659									
Benzene	N.D.	20	20.53	20	21.62	103	108	78-120	5	30
Ethylbenzene	N.D.	20	20.95	20	22.1	105	110	78-120	5	30
Methyl Tertiary Butyl Ether	N.D.	20	20.53	20	22.16	103	111	75-120	8	30
Toluene	N.D.	20	21.07	20	22.03	105	110	80-120	4	30
Xylene (Total)	N.D.	60	60.37	60	63.56	101	106	80-120	5	30
Batch number: P163542AA	Sample number(s): 8747661-8747666 UNSPK: P747667									
Benzene	N.D.	20	21.25	20	21.05	106	105	78-120	1	30
Ethylbenzene	N.D.	20	21.92	20	21.53	110	108	78-120	2	30
Methyl Tertiary Butyl Ether	N.D.	20	21.29	20	21.31	106	107	75-120	0	30

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 01/12/2017 09:14

Group Number: 1745121

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Toluene	N.D.	20	21.69	20	21.5	108	107	80-120	1	30
Xylene (Total)	N.D.	60	62.76	60	62.07	105	103	80-120	1	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 16356A20A	Sample number(s): 8747663-8747664 UNSPK: P753059									
NWTPH-Gx water C7-C12	N.D.	1100	1145.48	1100	1101.41	104	100	79-120	4	30

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: P163541AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8747659	101	103	111	113
8747660	101	102	111	113
Blank	101	103	111	111
LCS	101	105	104	104
MS	102	104	106	108
MSD	102	105	105	107
Limits:	80-116	77-113	80-113	78-113

Analysis Name: VOCs 8260 BTEX/MTBE
Batch number: P163542AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8747661	101	99	108	112
8747662	103	103	107	113
8747663	101	100	108	113
8747664	100	98	108	111
8747665	101	99	107	112
8747666	105	105	106	113
Blank	102	102	107	113
LCS	102	103	100	105
MS	101	99	101	105
MSD	103	102	101	105
Limits:	80-116	77-113	80-113	78-113

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16351A53A

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1745121
Reported: 01/12/2017 09:14

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16351A53A

	Trifluorotoluene-F
8747659	97
8747660	132
8747661	100
Blank	110
LCS	107
LCSD	108
Limits:	63-135

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16354C20A

	Trifluorotoluene-F
8747662	87
8747665	124
8747666	81
Blank	78
LCS	94
LCSD	91
Limits:	63-135

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 16356A20A

	Trifluorotoluene-F
8747663	96
8747664	88
Blank	88
LCS	98
MS	99
MSD	98
Limits:	63-135

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 163560018A

	Orthoterphenyl
8747659	89
8747660	96
8747661	82
8747662	79
8747663	71
Blank	91
LCS	97
LCSD	92

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1745121
Reported: 01/12/2017 09:14

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 163560018A

Limits: 50-150

Analysis Name: DRO/DX Mini-extraction Master
Batch number: 163570036A

	Orthoterphenyl
8747664	80
8747665	48*
Blank	87
LCS	88
LCSD	83

Limits: 50-150

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

13255 1745121 8747659-66

bp rm

Laboratory Management Program LaMP Chain of Custody Record R215977

Page ____ of ____

BP Site Node Path: ____ **Req Due Date (mm/dd/yy):** ____ **Rush TAT:** Yes ___ No ___

BP Facility No: WA-11060 SAA 12/18/16 **Lab Work Order Number:** ____

Lab Name:	Eurofins Lancaster Labs Env.	Facility Address:	4580 Fauntleroy Way SW, AA	Consultant/Contractor:	Arcadis
Lab Address:	2425 New Holland Pike, Lancaster, PA 17601	City, State, ZIP Code:	Seattle, WA	Consultant/Contractor Project No:	GP09BPNA.WA98
Lab PM:	Stacy Hess	Lead Regulatory Agency:	Ecology	Address:	1100 Olive Way, Suite 800, Seattle WA 98101
Lab Phone:	717-656-2300	California Global ID No.:		Consultant/Contractor PM:	Brian Marcum
Lab Shipping Accnt:		Enfos Proposal No:		Phone: 503-220-8201	Email: brian.marcum@arcadis.com
Lab Bottle Order No:		Accounting Mode:	Provision ___ OOC-BU ___ OOC-RM ___	Email EDD To:	ryan.bracchia@arcadis.com, richard.rodriguez@arcadis.com and to lab.enfosdoc@bp.com
Other Info:		Stage:	Activity:	Invoice To:	BP ___ Contractor ✓
BP Project Manager (PM):				Report Type & QC Level	Standard ✓
BP PM Phone:					Full Data Package ___
BP PM Email:					

Lab No.	Sample Description	Date	Time	Soil / Solid	(Water) / Liquid	Air / Vapor	Is this location a well?	Total Number of Container	Unpreserved	H2SO4	HNO3	HCl	Methanol	GRO by NWTPH-Gx	DRO/HO by NWTPH-Dx	BTEX/MTBE by 8260B							Comments
	GMW-1	12/13/16	1335		X		Y	8				8		X	X	X							
	MW-2	↓	1505		X		Y	8				8		X	X	X							
	MW-3	↓	1436		X		Y	8				8		X	X	X							
	MW-4	↓	1620		X		Y	8				8		X	X	X							
	MW-5	↓	1551		X		Y	8				8		X	X	X							
	MW-6	↓	1405		X		Y	8				8		X	X	X							
	DUP-1	↓	—		X		Y	8				8		X	X	X							
	Trip Blank	—	—		X			2						X		X							

Comments — Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	Alex Pink	Alex Pink	12/13/16	1150	[signature] /ELLE	12/13/16	11:50
Sampler's Company:	Arcadis						
Shipment Method:	Ship Date:						
Shipment Tracking No:					[signature]	12.14.16	8:30

Special Instructions: questions or concerns call Alex Pink - 906-440-8394

THIS LINE - LAB USE ONLY: Custody Seals In Place: (Yes) / No | Temp Blank: (Yes) / No | Cooler Temp on Receipt: 0.2 °F/(C) | Trip Blank: (Yes) / No | MS/MSD Sample Submitted: Yes / (No)

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 170709

Group Number(s): 174512(

Client: ARCADIS

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	12/14/2016 8:30
Number of Packages:	1	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Porsha Hill (12046) at 10:38 on 12/14/2016

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.2	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425
T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ATTACHMENT C

PSCAA Permit No 29664

pscleanair.org
Puget Sound Clean Air Agency

Puget Sound Clean Air Agency

Notice of Construction No. **10813**

HEREBY ISSUES AN ORDER OF APPROVAL TO CONSTRUCT, INSTALL, OR ESTABLISH

Registration No. **29664**

Date

Soil remediation project at the former Atlantic Richfield Company (ARCO) Facility No. 11060. The project includes an air sparge and soil vapor extraction (AS/SVE) treatment unit equipped with a catalytic oxidizer.

APPLICANT

Arti Patel
ARCADIS U.S., Inc
2929 Briarpark Drive, Suite 300
Houston, TX 77042

OWNER

Arti Patel
ARCADIS U.S., Inc
2929 Briarpark Drive, Suite 300
Houston, TX 77042

INSTALLATION ADDRESS

Former Arco #11060 Remediation, 4580 Fauntleroy Way SW, Seattle, WA 98126-2740

THIS ORDER IS ISSUED SUBJECT TO THE FOLLOWING RESTRICTIONS AND CONDITIONS

1. Approval is hereby granted as provided in Article 6 of Regulation I of the Puget Sound Clean Air Agency to the applicant to install or establish the equipment, device or process described hereon at the INSTALLATION ADDRESS in accordance with the plans and specifications on file in the Engineering Division of the Puget Sound Clean Air Agency.

2. This approval does not relieve the applicant or owner of any requirement of any other governmental agency.

3. All vapors from the remediation extraction system shall be vented to a catalytic oxidizer until the criteria in Condition No. 8 of this Order of Approval have been met.

4. The maximum influent flow rate to the catalytic oxidizer shall not exceed 120 standard cubic feet per minute.

5. The control efficiency of the catalytic oxidizer shall be maintained at a minimum of 98% by weight when the TPH influent concentration to the catalytic oxidizer is greater than or equal to 200 ppmv.

6. The catalyst inlet temperature shall be at least 625 degrees Fahrenheit.

7. To determine compliance with Conditions 4, 5 and 6 of this Order of Approval, the owner or operator shall conduct monthly monitoring on the catalytic oxidizer as specified below:

   a. Measure the catalyst inlet temperature;

   b. Analyze inlet gas stream to determine the flow rate and the concentration of total petroleum hydrocarbon (TPH);

   c. Analyze exhaust gas to determine the flow rate and the concentration of TPH; and

   d. Calculate the control efficiency based on the inlet and exhaust gas analysis.

Initial monitoring shall be performed no later than 15 days after start-up of the catalytic oxidizer. Gas concentration shall be determined using a photoionization detector (PID) or other equivalent method approved by the Agency.

8. The owner or operator may operate the air sparge and soil vapor extraction treatment unit without the catalytic oxidizer when sampling data for two or more consecutive months demonstrates the following criteria are met:

   a. The pre-control total petroleum hydrocarbon (TPH) emissions are less than 2.5 pounds per day; and

   b. The pre-control benzene emissions are less than 0.018 pounds per day.

   Written approval from the Puget Sound Clean Air Agency must be obtained prior to removal of the catalytic oxidizer. Approval is based on review of monitoring data submitted in writing to the Agency, including measured flow rate and concentrations of TPH and benzene and an estimate of daily emissions for TPH and benzene.

9. The owner or operator shall maintain the following records on-site for at least two years and shall make them available to Agency personnel upon request:

   a. All monitoring results showing the concentration of TPH at the inlet and outlet to the catalytic oxidizer, including the date monitoring was conducted;

   b. Calculations showing the control efficiency of the catalytic oxidizer based on monitoring results;

   c. All monitoring results showing the pre-control concentration of TPH and benzene are below the criteria in Condition 8 of this Order of Approval, including the date the monitoring was conducted;

   d. All measurements of the influent flow rate to the catalytic oxidizer; and

   e. All measurements of the catalyst inlet temperature.

10. The owner or operator shall report any non-compliance with Condition No. 5 of this Order of Approval to the Agency no later than 30 days after it is first discovered. The owner or operator shall detail the corrective action taken and include the data showing the exceedance as well as the time of occurrence in the submittal.

APPEAL RIGHTS

Pursuant to Puget Sound Clean Air Agency's Regulation I, Section 3.17 and RCW 43.21B.310, this Order may be appealed to the Pollution Control Hearings Board (PCHB). To appeal to the PCHB, a written notice of appeal must be filed with the PCHB and a copy served upon Puget Sound Clean Air Agency within 30 days of the date the applicant receives this Order.

Margaret L. Corbin
Reviewing Engineer

Carole Cenci
Compliance Manager

ATTACHMENT D

Soil Vapor Extraction - Laboratory Report and Chain-of-Custody Documentation

eurofins | Lancaster Laboratories Environmental

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: April 29, 2016

Project: WA-11060

Submittal Date: 04/22/2016
Group Number: 1653238
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-Effluent-042116 Air	8345582
11060-Influent-042116 Air	8345583

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	Atlantic Richfield c/o ARCADIS	Attn: Casey Sanders
Electronic Copy To	Atlantic Richfield c/o ARCADIS	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Butt
Specialist

(717) 556-7236

Project Name: WA-11060
LL Group #: 1653238

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

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Analysis Report

Sample Description: 11060-Effluent-042116 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8345582
LL Group # 1653238
Account # 13255

Project Name: WA-11060

Collected: 04/21/2016 13:20 by JL

Submitted: 04/22/2016 09:45
Reported: 04/29/2016 12:42

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1611330AA	04/22/2016 19:54	Jeffrey B Smith	1

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Analysis Report

Sample Description: 11060-Influent-042116 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8345583
LL Group # 1653238
Account # 13255

Project Name: WA-11060

Collected: 04/21/2016 13:30 by JL

Submitted: 04/22/2016 09:45
Reported: 04/29/2016 12:42

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result		MDL	Final Result		MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)		ppm(v)	mg/m3		mg/m3	
07090	Benzene	71-43-2	0.82	J	0.50	2.6	J	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	760		5.0	2,700		18	1
07090	Ethylbenzene	100-41-4	0.68	J	0.40	3.0	J	1.7	1
07090	Toluene	108-88-3	0.93	J	0.80	3.5	J	3.0	1
07090	Xylene (total)	1330-20-7	1.8	J	0.70	7.8	J	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1611330AA	04/22/2016 20:23	Jeffrey B Smith	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Group Number: 1653238
Reported: 04/29/2016 12:42

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ppm(v)	ppm(v)
Batch number: M1611330AA	Sample number(s): 8345582-8345583	
Benzene	N.D.	0.50
>C4-C10 Hydrocarbons hexane	N.D.	5.0
Ethylbenzene	N.D.	0.40
Toluene	N.D.	0.80
Xylene (total)	N.D.	0.70

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1611330AA	Sample number(s): 8345582-8345583								
Benzene	10.1	8.91	10.1	8.97	88	89	71-116	1	30
Ethylbenzene	10	7.02	10	7.38	70	74	59-144	5	30
Toluene	10	9.47	10	9.89	95	99	77-143	4	30
Xylene (total)	29.8	19.75	29.8	21.36	66	72	58-148	8	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1653238 For Eurofins Lancaster Laboratories Environmental use only Sample # 8345582-83 Bottle Order (SCR) # ______

Instructions on reverse side correspond with circled numbers.

(1) Client Information

Client: Arcadis
Account #:
Project Name/#: 11060
Project Manager: Brian Arrowy
P.O. #: 6109 BPNAWAUS
Sampler: Jason Litta
Quote #:
Name of state where samples were collected: Washington

(3) Turnaround Time Requested (TAT) (circle one)

Standard (circled) Rush (specify) ______

(4) Data Package Required?

Yes No

(5) EDD Required?

Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	70	60	—	—
Maximum	—	—	—	—
Minimum	—	—	—	—

(2) Sample Information

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18 ☐ MTBE ☑ BTEX	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
11060-effluent-042116	4-21/1320	4-21/1320	TEDLAR	—	70	70	—		1	—	✓	✓				
11060-influent-042116	4-21/1330	4-21/1330	TEDLAR	—	70	70	—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						
							—		1	—						

(7) Instructions/QC Requirements & Comments

EPA 25 (check one)

☐ C1 - C4 ☐ C2 - C10
☐ C1 - C10 ☑ C4 - C10 (GRO)
☐ C2 - C4

(8)

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
FedEx	4-21/1620						
Relinquished by: [signature]	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 4/22/16 09:45

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Sample Administration Receipt Documentation Log

Doc Log ID: 143917

Group Number(s):

Client: Arcadis

11060 165238

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	04/22/2016 9:45
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Katie Hartlove (2114) at 10:29 on 04/22/2016

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: May 17, 2016

Project: WA-11060

Submittal Date: 05/12/2016
Group Number: 1659800
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-Influent-051016 Grab Air	8376454
11060--Effluent-051016 Grab Air	8376455

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Casey Sanders
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Butt
Specialist

(717) 556-7236

Project Name: WA-11060
LL Group #: 1659800

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

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Analysis Report

Sample Description: 11060-Influent-051016 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8376454
LL Group # 1659800
Account # 13255

Project Name: WA-11060

Collected: 05/10/2016 11:30 by JL

Submitted: 05/12/2016 09:30
Reported: 05/17/2016 12:24

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	590	5.0	2,100	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1613430AA	05/13/2016 19:46	Alexander D Sechrist	1

Sample Description: 11060--Effluent-051016 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8376455
LL Group # 1659800
Account # 13255

Project Name: WA-11060

Collected: 05/10/2016 11:40 by JL

Submitted: 05/12/2016 09:30
Reported: 05/17/2016 12:24

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1613430AA	05/13/2016 20:16	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Group Number: 1659800
Reported: 05/17/2016 12:24

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ppm(v)	ppm(v)
Batch number: M1613430AA	Sample number(s): 8376454-8376455	
Benzene	N.D.	0.50
>C4-C10 Hydrocarbons hexane	N.D.	5.0
Ethylbenzene	N.D.	0.40
Toluene	N.D.	0.80
Xylene (total)	N.D.	0.70

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1613430AA	Sample number(s): 8376454-8376455								
Benzene	10.1	8.08	10.1	7.64	80	76	71-116	6	30
Ethylbenzene	10	8.41	10	7.75	84	77	59-144	8	30
Toluene	10	9.93	10	9.13	99	91	77-143	8	30
Xylene (total)	29.8	25.61	29.8	22.79	86	76	58-148	12	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

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Summa Canister Field Test Data/Chain of Custody

Acct. # 13255 Group # ______ For Eurofins Lancaster Laboratories Environmental use only Sample # 8376454-55 Bottle Order (SCR) # ______

1659800

Instructions on reverse side correspond with circled numbers

(1) **Client Information**

Client: Arcadis Account #:

Project Name/#: 11060

Project Manager: Brian Marcum P.O. #: G709BPNAWA.48

Sampler: Jason Little Quote #:

Name of state where samples were collected: Washington

(3) **Turnaround Time Requested (TAT)** (circle one)

Standard (circled) Rush (specify) ______

(4) **Data Package Required?** Yes No

(5) **EDD Required?** Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	72	72	—	—
Maximum	—	—	—	—
Minimum	—	—	—	—

(2)

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
11060-influent-051016	5-10/1130	5-10/1130	TEDLAR	TEDLAR			—			—		✓	✓			
11060-effluent-051016	5-10/1140	5-10/1140	TEDLAR	TEDLAR			—			—						

(6) Analyses Requested: EPA 18: ☐ MTBE ☑ BTEX

(7) **Instructions/QC Requirements & Comments**

any questions call Jason Little 206-492-7735

EPA 25 (check one)

☐ C1 - C4 ☐ C2 - C10

☐ C1 - C10 ☑ C4 - C10 (GRO)

☐ C2 - C4

Canisters Shipped by: Fed EX	Date/Time: 5-10-16	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by: [signature]	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 5/12/16

(8)

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7056 0713

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Sample Administration Receipt Documentation Log

Doc Log ID: 146263

Group Number(s):

Client: Arcadis

1659800

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	05/12/2016 9:30
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	No	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Katie Hartlove (2114) at 11:15 on 05/12/2016

Samples Not Intact Details

Sample ID on Label	Bottle Code	Bottle Quantity	Container Salvageable?	Comments
11060-Effluent-051016	Tedlar bag - None	1	N	rcvd empty. No visible tears.

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: June 17, 2016

Project: WA-11060

Submittal Date: 06/15/2016
Group Number: 1672186
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-Influent-061316 Air	8426776
11060-Effluent-061316 Air	8426777

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Casey Sanders
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Butt
Specialist

(717) 556-7236

Project Name: WA-11060
LL Group #: 1672186

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

Sample Description: 11060-Influent-061316 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8426776
LL Group # 1672186
Account # 13255

Project Name: WA-11060

Collected: 06/13/2016 15:50 by JL

Submitted: 06/15/2016 09:30
Reported: 06/17/2016 12:52

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1616730AA	06/15/2016 19:14	Alexander D Sechrist	1

Sample Description: 11060-Effluent-061316 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8426777
LL Group # 1672186
Account # 13255

Project Name: WA-11060

Collected: 06/13/2016 16:00 by JL

Submitted: 06/15/2016 09:30
Reported: 06/17/2016 12:52

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	0.93 J	0.50	3.0 J	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	1,100	5.0	4,000	18	1
07090	Ethylbenzene	100-41-4	1.0	0.40	4.5	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	2.1	0.70	9.3	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1616730AA	06/15/2016 19:44	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Group Number: 1672186
Reported: 06/17/2016 12:52

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	ppm(v)	ppm(v)
Batch number: M1616730AA	Sample number(s): 8426776-8426777	
Benzene	N.D.	0.50
>C4-C10 Hydrocarbons hexane	N.D.	5.0
Ethylbenzene	N.D.	0.40
Toluene	N.D.	0.80
Xylene (total)	N.D.	0.70

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1616730AA	Sample number(s): 8426776-8426777								
Benzene	10	10.59	10	10.4	106	104	71-116	2	30
Ethylbenzene	10	11.23	10	10.9	112	109	59-144	3	30
Toluene	10	13.83	10	13.73	138	137	77-143	1	30
Xylene (total)	30	36.76	30	33.11	123	110	58-148	10	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1672186 For Eurofins Lancaster Laboratories Environmental use only Sample # 542677-77 Bottle Order (SCR) # ____

Instructions on reverse side correspond with circled numbers

(1) Client Information

Client: Arcadis | Account #:
Project Name/#: 4060 | P.O. #:
Project Manager: Brian Mercer | Quote #:
Sampler: Jason Little
Name of state where samples were collected: WA

(3) Turnaround Time Requested (TAT) (circle one): (Standard) Rush (specify) ____

(4) Data Package Required? Yes / No

(5) EDD Required? Yes / No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	66	66	—	—
Maximum	—	—	—	—
Minimum	—	—	—	—

(6) Analyses Requested

(2) Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18 ☐ / BTEX ☑ / MTBE ☐	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
4060-influent-061316	6-13 / 1550	—	TEDLAR	—	66	66	—		1	—		✓	✓			
4060-effluent-061316	6-13 / 1600	—	TEDLAR	—	66	66	—		1	—		✓	✓			

(7) Instructions/QC Requirements & Comments

Any questions call Jason Little 206-992-7715

EPA 25 (check one): ☐ C1 - C4 ☐ C2 - C10 ☐ C1 - C10 ☑ C4 - C10 (GRO) ☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by	Date/Time:	Received by:	Date/Time (8)
Fed Ex	6-14-16						
Relinquished by	Date/Time: 6-14 1545	Received by:	Date/Time:	Relinquished by	Date/Time:	Received by:	Date/Time:
Relinquished by	Date/Time:	Received by:	Date/Time:	Relinquished by	Date/Time:	Received by:	Date/Time:

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Sample Administration Receipt Documentation Log

Doc Log ID: 150440

Group Number(s):

Client: Arcadis

1672186

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	06/15/2016 9:30
Number of Packages:	1	Number of Projects:	1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	No
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Katie Hartlove (2114) at 13:13 on 06/15/2016

Sample ID Discrepancy Details

Sample ID on COC	Sample ID on Label	Comments
11060-Influent	11060-Effluent	Sample labels for 11060 say Influent @ 1600, effluent @ 1550.

2425 New Holland Pike
Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: September 08, 2016

Project: WA-11060

Submittal Date: 08/26/2016
Group Number: 1699971
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060- Influent-082416 Air	8549846
11060- Effluent-082416 Air	8549847

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ .

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Casey Sanders
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1699971

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

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Analysis Report

Sample Description: 11060- Influent-082416 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8549846
LL Group # 1699971
Account # 13255

Project Name: WA-11060

Collected: 08/24/2016 11:45 by SW

Submitted: 08/26/2016 09:35
Reported: 09/08/2016 13:46

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result		MDL	Final Result		MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)		ppm(v)	mg/m3		mg/m3	
07090	Benzene	71-43-2	N.D.		0.50	N.D.		1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	560		5.0	2,000		18	1
07090	Ethylbenzene	100-41-4	0.77	J	0.40	3.3	J	1.7	1
07090	Toluene	108-88-3	N.D.		0.80	N.D.		3.0	1
07090	Xylene (total)	1330-20-7	1.6	J	0.70	6.8	J	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1623930AA	08/26/2016 15:10	Alexander D Sechrist	1

Sample Description: 11060- Effluent-082416 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8549847
LL Group # 1699971
Account # 13255

Project Name: WA-11060

Collected: 08/24/2016 12:00 by SW

Submitted: 08/26/2016 09:35
Reported: 09/08/2016 13:46

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1623930AA	08/26/2016 15:40	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1699971
Reported: 09/08/2016 13:46

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1623930AA	Sample number(s): 8549846-8549847			
Benzene	N.D.	0.50	N.D.	1.6
>C4-C10 Hydrocarbons hexane	N.D.	5.0	N.D.	18
Ethylbenzene	N.D.	0.40	N.D.	1.7
Toluene	N.D.	0.80	N.D.	3.0
Xylene (total)	N.D.	0.70	N.D.	3.0

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1623930AA	Sample number(s): 8549846-8549847								
Benzene	10	10.03	10	10.26	100	103	71-116	2	30
Ethylbenzene	10	10.58	10	10.79	106	108	59-144	2	30
Toluene	10	13.08	10	13.27	131	133	77-143	1	30
Xylene (total)	30	31.26	30	32.18	104	107	58-148	3	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1699911 For Eurofins Lancaster Laboratories Environmental use only Sample # 8549846-47 Bottle Order (SCR) # _____

Instructions on reverse side correspond with circled numbers.

(1) Client Information

Client: Arcadis — Account #:

Project Name/#: BP-11060 GP09BPNA.WA48

Project Manager: Brian Marcum — P.O. #:

Sampler: Scott Wenning — Quote #:

Name of state where samples were collected: Washington

(3) Turnaround Time Requested (TAT) (circle one): Standard / Rush (specify) _____

(4) Data Package Required? Yes / No

(5) EDD Required? Yes / No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient				
Maximum				
Minimum				

(6) Analyses Requested

(2) Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18 / ☒ BTEX ☐ MTBE	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search	
11060 - Influent-092416	8/24/16 1145	—	—	—	—	—	—		1	—		X	X				
11060 - Effluent-092417	8/24/16 1200	—	—	—	—	—	—		1	—		X	X				
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							

(7) Instructions/QC Requirements & Comments

Any Questions call 206-992-7735
Jason Link

EPA 25 (check one): ☐ C1 - C4 ☐ C2 - C10 ☐ C1 - C10 ☑ C4 - C10 (GRO) ☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time: (8)
Fed Ex	8/24/16						
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
							8/26/16 9:35

7056 0713
SMA 8/31/16

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Sample Administration Receipt Documentation Log

Doc Log ID: 160371

Group Number(s):

Client: Arcadis

169971

11060

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	08/26/2016 9:35
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Katie Hartlove (2114) at 11:58 on 08/26/2016

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: September 27, 2016

Project: WA-11060

Submittal Date: 09/21/2016
Group Number: 1709996
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-Influent-092016 Air	8594664
11060-Effluent-092016 Air	8594665

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Casey Sanders
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1709996

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

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Analysis Report

Sample Description: 11060-Influent-092016 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8594664
LL Group # 1709996
Account # 13255

Project Name: WA-11060

Collected: 09/20/2016 11:00 by JL

Submitted: 09/21/2016 09:30
Reported: 09/27/2016 15:03

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	670	5.0	2,400	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	0.88 J	0.70	3.8 J	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1626730AA	09/23/2016 13:38	Alexander D Sechrist	1

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Analysis Report

Sample Description: 11060-Effluent-092016 Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8594665
LL Group # 1709996
Account # 13255

Project Name: WA-11060

Collected: 09/20/2016 11:15 by JL

Submitted: 09/21/2016 09:30
Reported: 09/27/2016 15:03

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1626730AA	09/23/2016 14:07	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1709996
Reported: 09/27/2016 15:03

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1626730AA	Sample number(s): 8594664-8594665			
Benzene	N.D.	0.50	N.D.	1.6
>C4-C10 Hydrocarbons hexane	N.D.	5.0	N.D.	18
Ethylbenzene	N.D.	0.40	N.D.	1.7
Toluene	N.D.	0.80	N.D.	3.0
Xylene (total)	N.D.	0.70	N.D.	3.0

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1626730AA	Sample number(s): 8594664-8594665								
Benzene	10	8.44	10	8.30	84	83	71-116	2	30
Ethylbenzene	10	8.56	10	8.49	86	85	59-144	1	30
Toluene	10	10.95	10	10.41	110	104	77-143	5	30
Xylene (total)	30	25.39	30	24.94	85	83	58-148	2	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1709916 For Eurofins Lancaster Laboratories Environmental use only Sample # 8594664-65 Bottle Order (SCR) # ______

Instructions on reverse side correspond with circled numbers

(1) **Client Information**

Client: Arcadis
Account #:
Project Name/#: 11060
Project Manager: Brian Mossum
P.O.#: GP09BPNA WA.48 Moam
Sampler: Jason Litty
Quote #:
Name of state where samples were collected: WA

(3) **Turnaround Time Requested (TAT)** (circle one)

Standard (circled) Rush (specify) ______

(4) **Data Package Required?** Yes No

(5) **EDD Required?** Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	61	61	—	—
Maximum	—	—	—	—
Minimum	—	—	—	—

(2)

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search
11060 - influent - 092016	1100/9-20	—	TEDLAR	—			—			—			✓			
11060 - effluent - 092016	1115/9-20	—	TEDLAR	—			—			—						

(6) **Analyses Requested**: EPA TO-15; EPA 18 (☑ BTEX ☐ MTBE); EPA 25 (select range below); Helium as tracer; O2/CO2; Library Search

(7) **Instructions/QC Requirements & Comments**

Any Questions call Jason Litty 206-492-7735

EPA 25 (check one)

☐ C1 - C4 ☐ C2 - C10
☐ C1 - C10 ☑ C4 - C10 (GRO)
☐ C2 - C4

Canisters Shipped by: Fed-Ex	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by: [signature]	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: [signature]	Date/Time: 9/21/16 09:30

(8)

eurofins

Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 162742

Group Number(s):

Client: Arcadis

1709996

11060

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	09/21/2016 9:30
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	No	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Katie Hartlove (2114) at 11:19 on 09/21/2016

Samples Not Intact Details: 11060

Sample ID on Label	Bottle Code	Bottle Quantity	Container Salvageable?	Comments
11060-influent-092016	1 Liter Tedlar Bag - None	1	N	Also rcvd one intact.

2425 New Holland Pike
Lancaster, PA 17605-2425

T 717-656-2300
F 717-656-2681

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: November 03, 2016

Project: WA-11060

Submittal Date: 10/28/2016
Group Number: 1726331
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-INF-102716 Grab Air	8667535
11060-EFF-102716 Grab Air	8667536

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ryan Brauchla

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1726331

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

Sample Description: 11060-INF-102716 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8667535
LL Group # 1726331
Account # 13255

Project Name: WA-11060

Collected: 10/27/2016 13:15 by SW

Submitted: 10/28/2016 09:30
Reported: 11/03/2016 11:54

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result		MDL	Final Result		MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)		ppm(v)	mg/m3		mg/m3	
07090	Benzene	71-43-2	N.D.		0.50	N.D.		1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	280		5.0	1,000		18	1
07090	Ethylbenzene	100-41-4	0.54	J	0.40	2.4	J	1.7	1
07090	Toluene	108-88-3	N.D.		0.80	N.D.		3.0	1
07090	Xylene (total)	1330-20-7	1.8	J	0.70	7.9	J	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1630330AA	10/29/2016 17:13	Alexander D Sechrist	1

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Analysis Report

Sample Description: 11060-EFF-102716 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8667536
LL Group # 1726331
Account # 13255

Project Name: WA-11060

Collected: 10/27/2016 13:00 by SW

Submitted: 10/28/2016 09:30
Reported: 11/03/2016 11:54

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1630330AA	10/29/2016 17:42	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 11/03/2016 11:54

Group Number: 1726331

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1630330AA	Sample number(s): 8667535-8667536			
Benzene	N.D.	0.50	N.D.	1.6
>C4-C10 Hydrocarbons hexane	N.D.	5.0	N.D.	18
Ethylbenzene	N.D.	0.40	N.D.	1.7
Toluene	N.D.	0.80	N.D.	3.0
Xylene (total)	N.D.	0.70	N.D.	3.0

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1630330AA	Sample number(s): 8667535-8667536								
Benzene	10	10.23	10	10.32	102	103	71-116	1	30
Ethylbenzene	10	11.24	10	10.92	112	109	59-144	3	30
Toluene	10	13.63	10	13.12	136	131	77-143	4	30
Xylene (total)	30	34.4	30	32.57	115	109	58-148	5	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1726331 For Eurofins Lancaster Laboratories Environmental use only Sample # 866735-36 Bottle Order (SCR) # _____

Instructions on reverse side correspond with circled numbers.

(1) Client Information

Client: Arcadis | Account #:

Project Name/#: 11060

Project Manager: Brian Marcum | P.O. #: GP09BPWA.WA48

Sampler: Scott Wenning | Quote #:

Name of state where samples were collected: Washington

(3) Turnaround Time Requested (TAT) (circle one)

(Standard) Rush (specify) _____

(4) Data Package Required?

Yes No

(5) EDD Required?

Yes No

	Temperature (F)		Pressure ("Hg)	
	Start	Stop	Start	Stop
Ambient	58.0	58.0	—	—
Maximum	—	—	—	—
Minimum	—	—	—	—

(6) Analyses Requested

(2) Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18 ☐ MTBE ☒ BTEX	EPA 25 (select range below)	Helium as tracer	O2/CO2	Library Search	
11060-INF-102716	10-27/1315		TEDLAR		75.0		—		1	—		X	X				
11060-Eff-102716	10-27/1300		TEDLAR		58.0		—		1	—		X	X				
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							
							—		1	—							

(7) Instructions/QC Requirements & Comments

Questions: Scott.Wenning@arcadis.com or ~~Brian~~ Ross.LaGrandeur@arcadis.com

EPA 25 (check one)

☐ C1 - C4 ☐ C2 - C10

☐ C1 - C10 ☒ C4 - C10 (GRO)

☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time: (8)
UPS	10/27/16						
Relinquished by:	Date/Time: 10/27/16	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: Jeff Kber	Date/Time: 10-28-16 930

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Sample Administration Receipt Documentation Log

Doc Log ID: 166569

Group Number(s): 1726331

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	UPS	Arrival Timestamp:	10/28/2016 9:30
Number of Packages:	1	Number of Projects:	2
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	N/A	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	Yes
Missing Samples:	No	Air Quality Flow Controllers Present:	No
Extra Samples:	No	Air Quality Returns:	No
Discrepancy in Container Qty on COC:	No		

Unpacked by Joseph Huber (7831) at 09:32 on 10/28/2016

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: November 21, 2016

Project: WA-11060

Submittal Date: 11/17/2016
Group Number: 1734262
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-Influent-111616 Grab Air	8701301
11060-Effluent-111616 Grab Air	8701302

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Casey Sanders
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1734262

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

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Analysis Report

Sample Description: 11060-Influent-111616 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8701301
LL Group # 1734262
Account # 13255

Project Name: WA-11060

Collected: 11/16/2016 14:50 by JL

Submitted: 11/17/2016 09:30
Reported: 11/21/2016 14:33

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	1,500	50	5,400	180	10
07090	Ethylbenzene	100-41-4	2.6	0.40	11	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	3.3	0.70	14	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1632230AA	11/18/2016 00:40	Alexander D Sechrist	1
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1632330AA	11/18/2016 12:12	Alexander D Sechrist	10

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Analysis Report

Sample Description: 11060-Effluent-111616 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8701302
LL Group # 1734262
Account # 13255

Project Name: WA-11060

Collected: 11/16/2016 15:05 by JL

Submitted: 11/17/2016 09:30
Reported: 11/21/2016 14:33

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1632230AA	11/18/2016 01:09	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS
Reported: 11/21/2016 14:33

Group Number: 1734262

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1632230AA	Sample number(s): 8701301-8701302			
Benzene	N.D.	0.50	N.D.	1.6
>C4-C10 Hydrocarbons hexane	N.D.	5.0	N.D.	18
Ethylbenzene	N.D.	0.40	N.D.	1.7
Toluene	N.D.	0.80	N.D.	3.0
Xylene (total)	N.D.	0.70	N.D.	3.0
Batch number: M1632330AA	Sample number(s): 8701301			
>C4-C10 Hydrocarbons hexane	N.D.	5.0	N.D.	18

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1632230AA	Sample number(s): 8701301-8701302								
Benzene	10	9.99	10	9.91	100	99	71-116	1	30
Ethylbenzene	10	10.05	10	11.18	101	112	59-144	11	30
Toluene	10	12.65	10	12.71	126	127	77-143	1	30
Xylene (total)	30	29.92	30	33.91	100	113	58-148	13	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1734262 Sample # 8701301-02 Bottle Order (SCR) #

Client Information

Client: Arcadis
Account #:
Project Name/#: 11060
Project Manager: Brian Marum
P.O. #: 6109BPNAWA.4 8
Sampler: Jason Link
Quote #:
Name of state where samples were collected: WA

Turnaround Time Requested (TAT) (circle one)

Standard (circled) Rush (specify) ______

Data Package Required? Yes No

EDD Required? Yes No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	55	55	—	—
Maximum	—	—	—	
Minimum	—	—	—	—

Analyses Requested

EPA TO - 15; EPA 18 (☐ MTBE, ☑ BTEX); EPA 25 (select range below); Helium as tracer; O2/CO2; Library Search

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO - 15	EPA 18	EPA 25	Helium as tracer	O2/CO2	Library Search
11060-influent-111616	11/16/1450	—	TEDLAR	—	57	58	—	—	—	—		✓	✓			
11060-effluent-111616	11-16/1505	—	TEDLAR	—	57	—	—	—	—	—		✓	✓			

Instructions/QC Requirements & Comments

Any Questions call Jason Link 206-992-773

EPA 25 (check one)
☐ C1 - C4 ☐ C2 - C10
☐ C1 - C10 ☑ C4 - C10 (GRO)
☐ C2 - C4

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Fed EX	11/16/16/1540						
Relinquished by: [signature]	Date/Time: 11/16/1540	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: Anneliese H. Owen	Date/Time: 11/17/16 0930

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7056 1015

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Sample Administration Receipt Documentation Log

Doc Log ID: 168436

Group Number(s): 1734262

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	11/17/2016 9:30
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	No	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Anneliese Owen (210) at 10:23 on 11/17/2016

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Lancaster, PA 17605-2425

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

Report Date: December 28, 2016

Project: WA-11060

Submittal Date: 12/16/2016
Group Number: 1745511
PO Number: GP09BPNA.WA48
State of Sample Origin: WA

Client Sample Description	Lancaster Labs (LL) #
11060-Influent-121516 Grab Air	8749359
11060-Effluent-121516 Grab Air	8749360

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	ARCADIS U.S., Inc.	Attn: Richard Rodriguez
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Casey Sanders
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Jason Little
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Brian Marcum
Electronic Copy To	ARCADIS U.S., Inc.	Attn: Ross LaGrandeur

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Project Name: WA-11060
LL Group #: 1745511

General Comments:

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client. The compliance signature is located on the cover page of the Analysis Reports.

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

EPA 18 mod/EPA 25 mod, Volatiles in Air

Batch #: M1635130AA (Sample number(s): 8749359-8749360)

The relative percent difference(s) for the following analyte(s) in the LCS/LCSD were outside acceptance windows: Xylene (total)

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Analysis Report

Sample Description: 11060-Influent-121516 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8749359
LL Group # 1745511
Account # 13255

Project Name: WA-11060

Collected: 12/15/2016 13:20 by JL

Submitted: 12/16/2016 10:00
Reported: 12/28/2016 14:02

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	1,400	5.0	4,900	18	1
07090	Ethylbenzene	100-41-4	2.3	0.40	10	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1635130AA	12/16/2016 16:04	Alexander D Sechrist	1

Sample Description: 11060-Effluent-121516 Grab Air
WA-11060
4580 Fauntleroy Way SW - Seattle, WA

LL Sample # AQ 8749360
LL Group # 1745511
Account # 13255

Project Name: WA-11060

Collected: 12/15/2016 14:10 by JL

Submitted: 12/16/2016 10:00
Reported: 12/28/2016 14:02

Atlantic Richfield c/o ARCADIS
Suite 600
630 Plaza Drive
Highlands Ranch CO 80129

CAT No.	Analysis Name	CAS Number	Final Result	MDL	Final Result	MDL	DF
Volatiles in Air	**EPA 18 mod/EPA 25 mod**		ppm(v)	ppm(v)	mg/m3	mg/m3	
07090	Benzene	71-43-2	N.D.	0.50	N.D.	1.6	1
07090	>C4-C10 Hydrocarbons hexane	n.a.	N.D.	5.0	N.D.	18	1
07090	Ethylbenzene	100-41-4	N.D.	0.40	N.D.	1.7	1
07090	Toluene	108-88-3	N.D.	0.80	N.D.	3.0	1
07090	Xylene (total)	1330-20-7	N.D.	0.70	N.D.	3.0	1

MDL = Method Detection Limit

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07090	>C4-C10 + BTEX	EPA 18 mod/EPA 25 mod	1	M1635130AA	12/16/2016 16:33	Alexander D Sechrist	1

Quality Control Summary

Client Name: Atlantic Richfield c/o ARCADIS Group Number: 1745511
Reported: 12/28/2016 14:02

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ppm(v)	MDL ppm(v)	Result mg/m3	MDL mg/m3
Batch number: M1635130AA	Sample number(s): 8749359-8749360			
Benzene	N.D.	0.50	N.D.	1.6
>C4-C10 Hydrocarbons hexane	N.D.	5.0	N.D.	18
Ethylbenzene	N.D.	0.40	N.D.	1.7
Toluene	N.D.	0.80	N.D.	3.0
Xylene (total)	N.D.	0.70	N.D.	3.0

LCS/LCSD

Analysis Name	LCS Spike Added ppm(v)	LCS Conc ppm(v)	LCSD Spike Added ppm(v)	LCSD Conc ppm(v)	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: M1635130AA	Sample number(s): 8749359-8749360								
Benzene	10	8.79	10	9.78	88	98	71-116	11	30
Ethylbenzene	10	7.97	10	10.44	80	104	59-144	27	30
Toluene	10	10.82	10	12.85	108	129	77-143	17	30
Xylene (total)	30	23.29	30	31.96	78	107	58-148	31*	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Summa Canister Field Test Data/Chain of Custody

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Acct. # 13255 Group # 1745511 Sample # 8749359-60 Bottle Order (SCR) # ______

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Instructions on reverse side correspond with circled numbers.

(1) Client Information

Client: Arcadis   Account #:

Project Name/#: 11060   GM9BPNAWA.48

Project Manager: Brian Marvin   P.O. #:

Sampler: Jason Little   Quote #:

Name of state where samples were collected: WA

(3) Turnaround Time Requested (TAT) (circle one): Standard (circled)   Rush (specify) ______

(4) Data Package Required? Yes   No

(5) EDD Required? Yes   No

	Temperature (F) Start	Temperature (F) Stop	Pressure ("Hg) Start	Pressure ("Hg) Stop
Ambient	38	38	—	—
Maximum	—	—	—	—
Minimum	—	—	—	—

(6) Analyses Requested: EPA TO-15; EPA 18 (☐ BTEX ☐ MTBE); EPA 25 (select range below); Helium as tracer; O2/CO2; Library Search

(2)

Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Reg. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)	EPA TO-15	EPA 18	EPA 25	Helium as tracer	O2/CO2	Library Search
11060 - influent - 121516	12-15 / 1320	—	TEDLAR	—			—		1	—		✓	✓			
11060 - effluent - 121516	12-15 / 1410	—	TEDLAR	—			—		1	—		✓	✓			

(7) Instructions/QC Requirements & Comments

Any Questions call Jason Little 206-492-7721

EPA 25 (check one): ☐ C1 - C4   ☐ C2 - C10   ☐ C1 - C10   ☑ C4 - C10 (GRO)   ☐ C2 - C4

(8)

Canisters Shipped by:	Date/Time:	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:
FedEx	12/15/1530						
Relinquished by:	**Date/Time:**	**Received by:**	**Date/Time:**	**Relinquished by:**	**Date/Time:**	**Received by:**	**Date/Time:**
[signature]	12/15/1530						
Relinquished by:	**Date/Time:**	**Received by:**	**Date/Time:**	**Relinquished by:**	**Date/Time:**	**Received by:**	**Date/Time:**
						Annaliese H. Owen	12/16/16 1000

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Sample Administration Receipt Documentation Log

Doc Log ID: 171065

Group Number(s): 1745511

Client: Arcadis

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	12/16/2016 10:00
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	WA		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	No	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Anneliese Owen (210) at 12:25 on 12/16/2016

General Comments: 2 tedlar bags received deflated: Effluent from 12/14/16 at 1630 and Effluent from 12/15/16 at 1410. Back-up bag available for both.

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

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