



Remediation Management Services Company

4 Centerpointe Drive, Suite 200
La Palma, CA 90623
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August 8, 2019

Washington Department of Ecology
Southwest Regional Office
Attn: Mr. Tim Mullin
300 Desmond Drive SE
Lacey, WA 98503

Dear Mr. Mullin:

Please find the enclosed Semi-Annual Status Report - First Half of 2019, that documents the results at OPLC Tacoma Junction located at 2660 Frank Albert Road East, Fife, Washington.

Sincerely yours,

A handwritten signature in blue ink, appearing to read 'Wade Melton', on a light blue background.

Wade Melton
Operations Project Manager
Remediation Management Services Company
An affiliate of Atlantic Richfield Company

cc: File, Antea Group



Semi-Annual Status Report

First Half of 2019

OPLC Tacoma Junction

2660 Frank Albert Road East, Fife, Washington

Antea[®]Group

Understanding today.
Improving tomorrow.

PREPARED FOR

Remediation Management Services
Company

An affiliate of Atlantic Richfield Company
4 Centerpointe Drive, Suite 200
La Palma, CA 90623

and

BP Pipelines and Logistics
Olympic District

600 SW 39th Street, Suite 275
Renton, WA 98057

August 8, 2019

Antea Group Project No. WATJUAA191

us.anteagroup.com



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Appendix

Appendix A	Analytical Lab Reports and Chain-of-Custody Documentation
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Reporting Period.:	January 2019 – June 2019
Agency Contact:	Tim Mullin, Toxics Cleanup Program (360) 407-6265
Ecology Site ID No.:	24529
RM Contact:	Wade Melton, (360) 594-7978
Olympic Contact:	Alexandria Crooks, (425) 981-2590
Antea Group Contact:	Megan Richard, (425) 498-7711

1.0 Site History

- This site is an active OPLC facility that has been operating since 1965.
- In August 2015, OPLC personnel directed an excavation associated with a facility upgrade project. While excavating OPLC personnel noted petroleum odors and soil staining. Soil and water samples indicated concentrations of petroleum hydrocarbons in excess of Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A Cleanup Levels. Upon completing the planned excavation, over-excavating was performed to remove contaminated soil to the maximum extent without comprising onsite structures. A total of 302.49 tons of petroleum impacted soil was removed from the Site for disposal. A total of 1,200 gallons of water was removed from the excavation and transported off-site for disposal. Additional information regarding soil excavation and sampling activities can be found in Antea Group's October 12, 2015 *Site Discovery and Independent Remedial Action Report*.
- The Site was listed on Ecology's *Confirmed and Suspected Contaminated Sites List* on October 15, 2015.
- In June 2016, monitoring wells MW-1 through MW-5 were installed at the Site. Due to the presence of quarry spalls down to groundwater, only one soil sample was collected during well installation. Groundwater analytical results indicated the presence of total petroleum hydrocarbons as gasoline (TPH-G), total petroleum hydrocarbons as diesel (TPH-D), and benzene in MW- 2 in excess of Ecology's MTCA Method A Cleanup Levels at concentrations of 2,300 µg/L, 810 µg/L, and 100 µg/L, respectively. Additional information can be found in Antea Group's November 17, 2016 *Subsurface Investigation Report*.

2.0 Work Performed During the Reporting Period

- Quarterly groundwater monitoring and sampling events were conducted on January 30, 2019 and April 24, 2019. Groundwater samples were collected from monitoring wells MW-1 through MW-5. Due to the presence of light non-aqueous phase liquids (LNAPL), a sample was not collected from MW-2 during the second quarter 2019 sampling event.
- This semi-annual groundwater monitoring report was prepared.

3.0 Project Status

- Quarterly groundwater sample collection from MW-1 through MW-5.
- Semi-annual reporting.

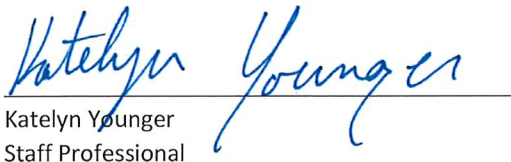
4.0 Data Review and Recommendations

- Groundwater analytical data from the first and second quarter sampling events did not indicate concentrations of petroleum hydrocarbons in excess of MTCA Method A Cleanup Levels in monitoring wells MW-1, and MW-3 through MW-5. MW-2 had concentrations of benzene, TPH-G, and TPH-D in excess of MTCA Method A Cleanup Levels in the first quarter 2019 sampling event.
- During the second quarter 2019 sampling event, LNAPL was measured in MW-2 at a thickness of 0.01 feet and the absorbent sock was replaced.
- Groundwater gauging data and analytical data are presented in Tables 1 and 2, respectively. The first and second quarter Groundwater Elevation Contour Maps are presented as Figures 3 and 4, respectively. The Groundwater Analytical Data Map is presented as Figure 5. The groundwater laboratory analytical reports are presented as Appendix A.
- Antea Group is scheduled to conduct the next quarterly groundwater sampling and monitoring events in July 2019.

5.0 Remarks

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Prepared by



Katelyn Younger
Staff Professional

Date: August 8, 2019

Reviewed by:



Date: August 8, 2019

Megan Richard, LG
Project Manager

cc: Mr. Tim Mullin, Department of Ecology Southwest Regional Office (Hardcopy, Electronic Copy)
Ms. Alexandria Crooks, OPLC, Renton, WA (Electronic Copy)
Mr. Wade Melton, Remediation Management Services Company (Electronic Copy - RMO Upload)
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Tables

Table 1	Groundwater Gauging Data
Table 2	Groundwater Analytical Data



TABLE 1
Groundwater Gauging Data
Tacoma Junction
2660 Frank Albert Road E
Fife, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-1	6/29/2016	100.00	1.82	NP	--	98.18	--
MW-1	9/8/2016	100.00	1.95	NP	--	98.05	--
MW-1	12/1/2016	100.00	0.76	NP	--	99.24	--
MW-1	2/22/2017	100.00	0.90	NP	--	99.10	--
MW-1	5/10/2017	100.00	1.52	NP	--	98.48	--
MW-1	8/16/2017	100.00	2.04	NP	--	97.96	--
MW-1	10/31/2017	100.00	1.22	NP	--	98.78	--
MW-1	2/13/2018	100.00	1.05	NP	--	98.95	--
MW-1	5/2/2018	100.00	1.36	NP	--	98.64	--
MW-1	8/8/2018	100.00	2.15	NP	--	97.85	--
MW-1	10/23/2018	100.00	1.87	NP	--	98.13	--
MW-1	1/30/2019	100.00	0.96	NP	--	99.04	--
MW-1	4/24/2019	100.00	1.50	NP	--	98.50	--
MW-2	6/29/2016	99.59	2.49	NP	--	97.10	--
MW-2	9/8/2016	99.59	3.44	3.42	0.02	96.17	--
MW-2	12/1/2016	99.59	1.73	NP	--	97.86	--
MW-2	2/22/2017	99.59	1.13	NP	--	98.46	--
MW-2	5/10/2017	99.59	1.39	NP	--	98.20	--
MW-2	8/16/2017	99.59	2.85	2.82	0.03	96.76	--
MW-2	10/31/2017	99.59	1.79	1.70	0.09	97.87	--
MW-2	2/13/2018	99.59	1.63	NP	--	97.96	--
MW-2	5/2/2018	99.59	1.83	NP	--	97.76	--
MW-2	8/8/2018	99.59	3.35	NP	--	96.24	--
MW-2	10/23/2018	99.59	2.96	2.95	0.01	96.64	--
MW-2	1/30/2019	99.59	2.20	NP	--	97.39	--
MW-2	4/24/2019	99.59	1.53	1.52	0.01	98.06	--
MW-3	6/29/2016	99.91	1.98	NP	--	97.93	--
MW-3	9/8/2016	99.91	2.61	NP	--	97.30	--
MW-3	12/1/2016	99.91	1.02	NP	--	98.89	--
MW-3	2/22/2017	99.91	1.11	NP	--	98.80	--
MW-3	5/10/2017	99.91	1.32	NP	--	98.59	--
MW-3	8/16/2017	99.91	2.26	NP	--	97.65	--
MW-3	10/31/2017	99.91	1.51	NP	--	98.40	--
MW-3	2/13/2018	99.91	1.00	NP	--	98.91	--
MW-3	5/2/2018	99.91	1.28	NP	--	98.63	--
MW-3	8/8/2018	99.91	2.46	NP	--	97.45	--
MW-3	10/23/2018	99.91	2.11	NP	--	97.80	--
MW-3	1/30/2019	99.91	1.09	NP	--	98.82	--
MW-3	4/24/2019	99.91	1.33	NP	--	98.58	--

TABLE 1
Groundwater Gauging Data
Tacoma Junction
2660 Frank Albert Road E
Fife, WA

Well I.D.	Date	GROUNDWATER ELEVATION DATA					
		TOC Elevation (ft)	Water Level Depth (ft)	LNAPL Depth (ft)	LNAPL Thickness (ft)	Water Level Elevation* (ft)	Qualifiers
MW-4	6/29/2016	99.70	2.20	NP	--	97.50	--
MW-4	9/8/2016	99.70	2.75	NP	--	96.95	--
MW-4	12/1/2016	99.70	1.00	NP	--	98.70	--
MW-4	2/22/2017	99.70	1.05	NP	--	98.65	--
MW-4	5/10/2017	99.70	1.34	NP	--	98.36	--
MW-4	8/16/2017	99.70	2.44	NP	--	97.26	--
MW-4	10/31/2017	99.70	1.35	NP	--	98.35	--
MW-4	2/13/2018	99.70	1.02	NP	--	98.68	--
MW-4	5/2/2018	99.70	1.29	NP	--	98.41	--
MW-4	8/8/2018	99.70	3.63	NP	--	96.07	--
MW-4	10/23/2018	99.70	2.20	NP	--	97.50	--
MW-4	1/30/2019	99.70	1.05	NP	--	98.65	--
MW-4	4/24/2019	99.70	1.35	NP	--	98.35	--
MW-5	6/29/2016	99.60	1.49	NP	--	98.11	--
MW-5	9/8/2016	99.60	1.57	NP	--	98.03	--
MW-5	12/1/2016	99.60	0.61	NP	--	98.99	--
MW-5	2/22/2017	99.60	0.77	NP	--	98.83	--
MW-5	5/10/2017	99.60	1.27	NP	--	98.33	--
MW-5	8/16/2017	99.60	1.70	NP	--	97.90	--
MW-5	10/31/2017	99.60	1.02	NP	--	98.58	--
MW-5	2/13/2018	99.60	0.82	NP	--	98.78	--
MW-5	5/2/2018	99.60	1.12	NP	--	98.48	--
MW-5	8/8/2018	99.60	1.80	NP	--	97.80	--
MW-5	10/23/2018	99.60	1.52	NP	--	98.08	--
MW-5	1/30/2019	99.60	0.73	NP	--	98.87	--
MW-5	4/24/2019	99.60	1.20	NP	--	98.40	--

Notes:

TOC - Top of Casing

ft - feet

NP - No Product

LNAPL - Light Non-Aqueous Phase Liquid

* - Corrected for LNAPL if present (assumes LNAPL specific gravity = 0.75)

-- No Information Available

Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E
Fife, WA

CONSTITUENT		B	T	E	X	TPH-G	TPH-D	TPH-O
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		5	1000	700	1000	800	500	500
Well ID	Date							
MW-1	6/29/2016	< 20	< 20	< 30	< 30	< 50	160	< 250
MW-1	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	150	< 250
MW-1	12/1/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	120	< 250
MW-1	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-1	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	< 100	< 260
MW-1	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 100	140	330
MW-1	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 100	< 260
MW-1	2/13/2018	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	5/2/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	130	< 350
MW-1	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-1	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0*	< 250	< 100	< 100
MW-2	6/29/2016	100	6.9	56	92	2300	810	< 250
MW-2	12/1/2016	170	8.7	280	250	7000	1700	< 260
MW-2	2/22/2017	90	< 20	120	110	6500	1300	< 250
MW-2	5/10/2017	85	6.4	220	150	6000	990	< 250
MW-2	2/13/2018	180	8.3	130	150	5000	2100	< 350
MW-2	5/2/2018	170 *	6.3 *	130	110	4200	1100	< 360
MW-2	8/8/2018	63	5.0	140	120	4400	4900	350
MW-2	1/30/2019	130	7.2	74	94	4500	1800	< 350
MW-3	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-3	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-3	12/1/2016	< 2.0	88	< 3.0	< 3.0	100	180	< 260
MW-3	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 260
MW-3	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	< 100	< 250
MW-3	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 100	< 100	< 250
MW-3	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 100	< 260
MW-3	2/13/2018	< 2.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	5/2/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	120	< 350
MW-3	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-3	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0*	< 250	< 100	< 100
MW-4	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	110	< 250
MW-4	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-4	12/1/2016	< 2.0	< 2.0	< 3.0	< 3.0	< 50	140	< 260

Table 2
Groundwater Analytical Data
Tacoma Junction
2660 Frank Albert Road E
Fife, WA

CONSTITUENT		B	T	E	X	TPH-G	TPH-D	TPH-O
UNIT		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
MTCA METHOD A CLEANUP LEVELS		5	1000	700	1000	800	500	500
MW-4	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 50	< 110	< 250
MW-4	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	120	< 250
MW-4	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	< 100	< 100	< 250
MW-4	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	100	< 250
MW-4	2/13/2018	< 2.0	< 2.0	< 3.0	< 3.0	< 250	130	< 350
MW-4	5/2/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	< 110	< 350
MW-4	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	130	< 350
MW-4	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	200	< 350
MW-4	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	110	< 350
MW-4	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0*	< 250	< 100	< 100
MW-5	6/29/2016	< 2.0	< 2.0	< 3.0	< 3.0	300	230	< 250
MW-5	9/8/2016	< 2.0	< 2.0	< 3.0	< 3.0	270	250	< 250
MW-5	12/1/2016	< 2.0	< 2.0	< 3.0	< 3.0	89	180	< 250
MW-5	2/22/2017	< 2.0	< 2.0	< 3.0	< 3.0	97	< 110	< 250
MW-5	5/10/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 500	220	< 250
MW-5	8/16/2017	< 1.0	< 1.0	< 1.0	< 3.0	240	150	< 250
MW-5	10/31/2017	< 2.0	< 2.0	< 3.0	< 3.0	< 250	120	< 260
MW-5	2/13/2018	3.4	< 2.0	7.4	< 3.0	330	250	< 370
MW-5	5/2/2018	< 3.0*	< 2.0*	< 3.0	< 3.0	< 250	< 110	< 350
MW-5	8/8/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	210	< 350
MW-5	10/23/2018	< 3.0	< 2.0	< 3.0	< 3.0	< 250	200	< 350
MW-5	1/30/2019	< 3.0	< 2.0	< 3.0	< 3.0	< 250	150	< 350
MW-5	4/24/2019	< 3.0	< 2.0	< 3.0	< 3.0*	< 250	130	< 100

Notes:

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylenes, Total

TPH-G = Total petroleum hydrocarbons as gasoline by Northwest Method NWTPH-Gx

TPH-D = Total petroleum hydrocarbons as diesel by Northwest Method NWTPH-Dx

TPH-O = Total petroleum hydrocarbons as oil by Northwest Method NWTPH-Dx

1,000/800¹ ug/L if no detectable levels of Benzene in the sample - otherwise 800 ug/L

<1.0 = Concentrations were not detected above the laboratory method reporting limit.

ug/L = Micrograms per liter (ppb)

-- = No value given/Not analyzed/Not applicable

MTCA = Model Toxics Control Act

Results in **bold** indicate concentrations in excess of MTCA Method A Cleanup Levels

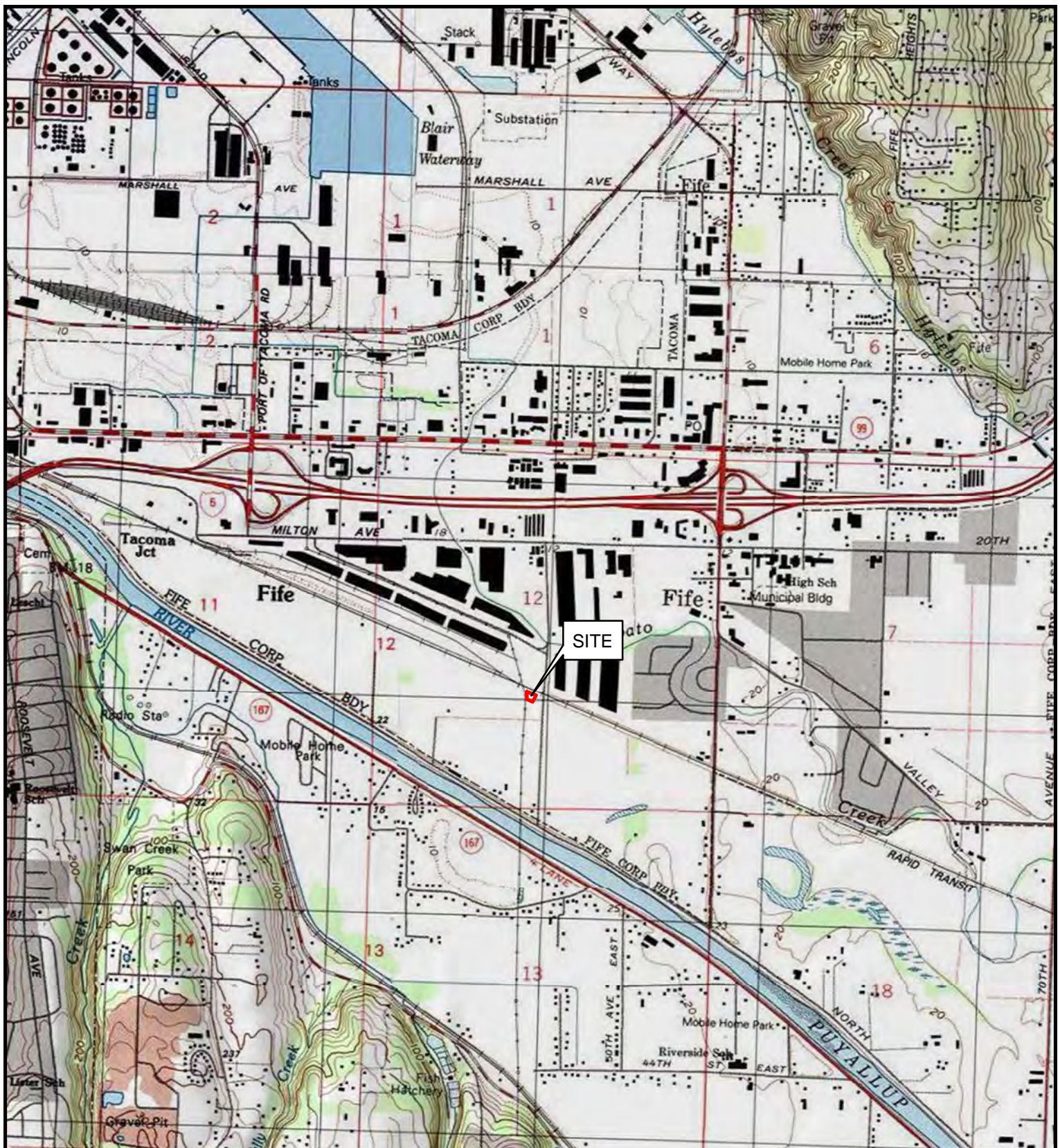
* = RPD of the LCS and LCSD exceeds the control limits. LCS or LCSD is outside acceptance limits.



Figures

- | | |
|----------|---|
| Figure 1 | Site Location Map |
| Figure 2 | Site Map |
| Figure 3 | Groundwater Elevation Contour Map – January 30, 2019 |
| Figure 4 | Groundwater Elevation Contour Map – April 24, 2019 |
| Figure 5 | Groundwater Analytical Data Map – January 30, 2019 and April 24, 2019 |





USGS 7.5-minute Series
Topographic Series
Puyallup, WA, 2013

0 500 1,000 2,000 3,000 4,000 Feet



FIGURE 1

SITE LOCATION MAP
OLYMPIC PIPE LINE COMPANY - TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WA

PROJECT NO.

WATACIUSA181

PREPARED BY

MB

REF SCALE

1:24,000

DATE

1/24/2019

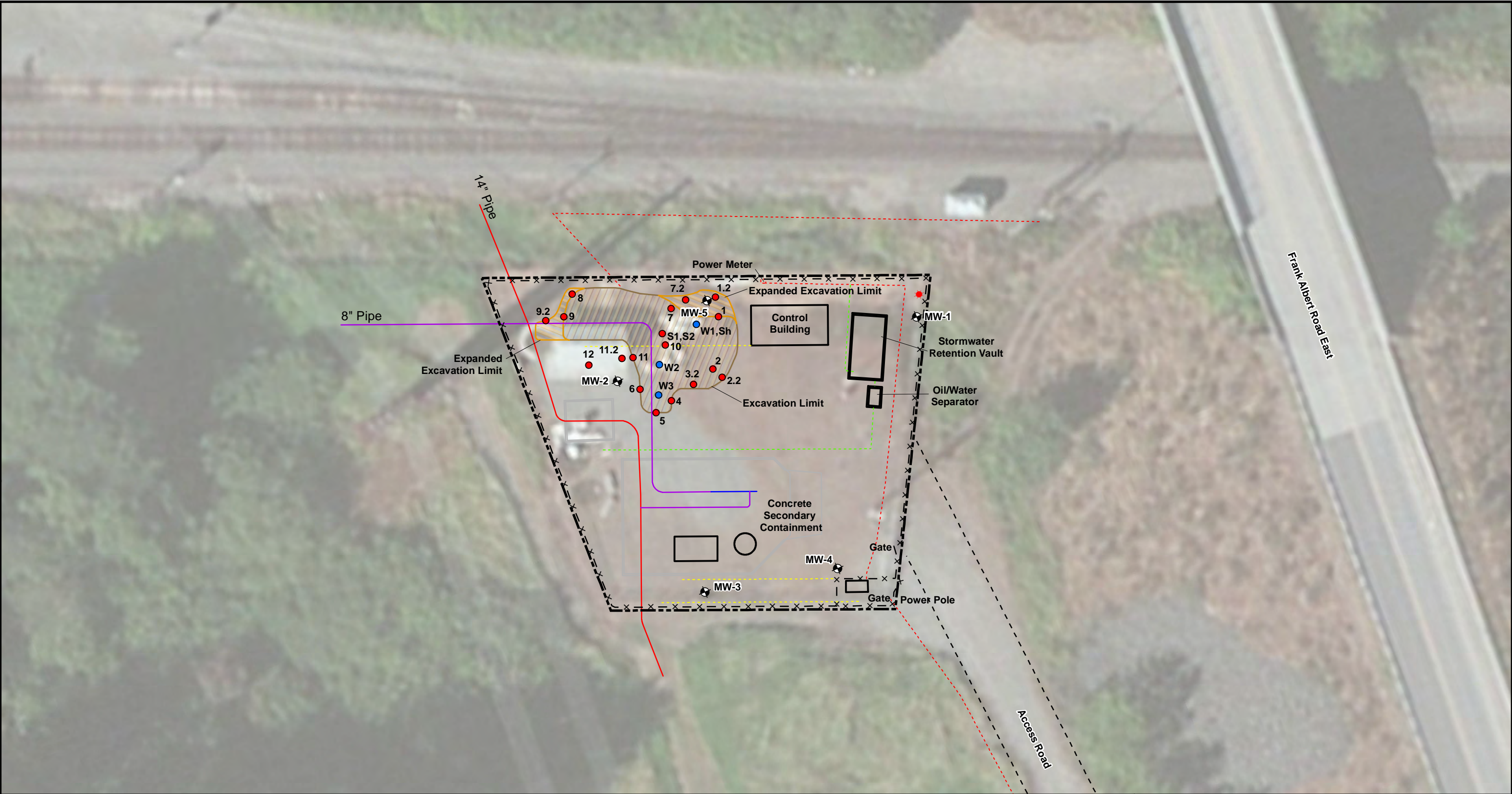
REVIEWED BY

FS

MAP SCALE

1 INCH = 2,000 FEET





Legend

- | | | |
|--------------------------|--------------------|-----------------------|
| Monitoring Well Location | Property Boundary | Utility - Storm Water |
| Light Pole | Fence | Groundwire |
| Soil Sample Location | 14" Pipeline | |
| Water Sample Location | 10" Pipeline | |
| Original Excavation | 8" Pipeline | |
| Expanded Excavation | Utility - Electric | |

Sources: 2013, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

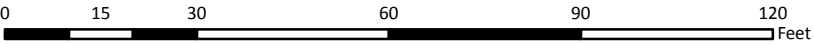
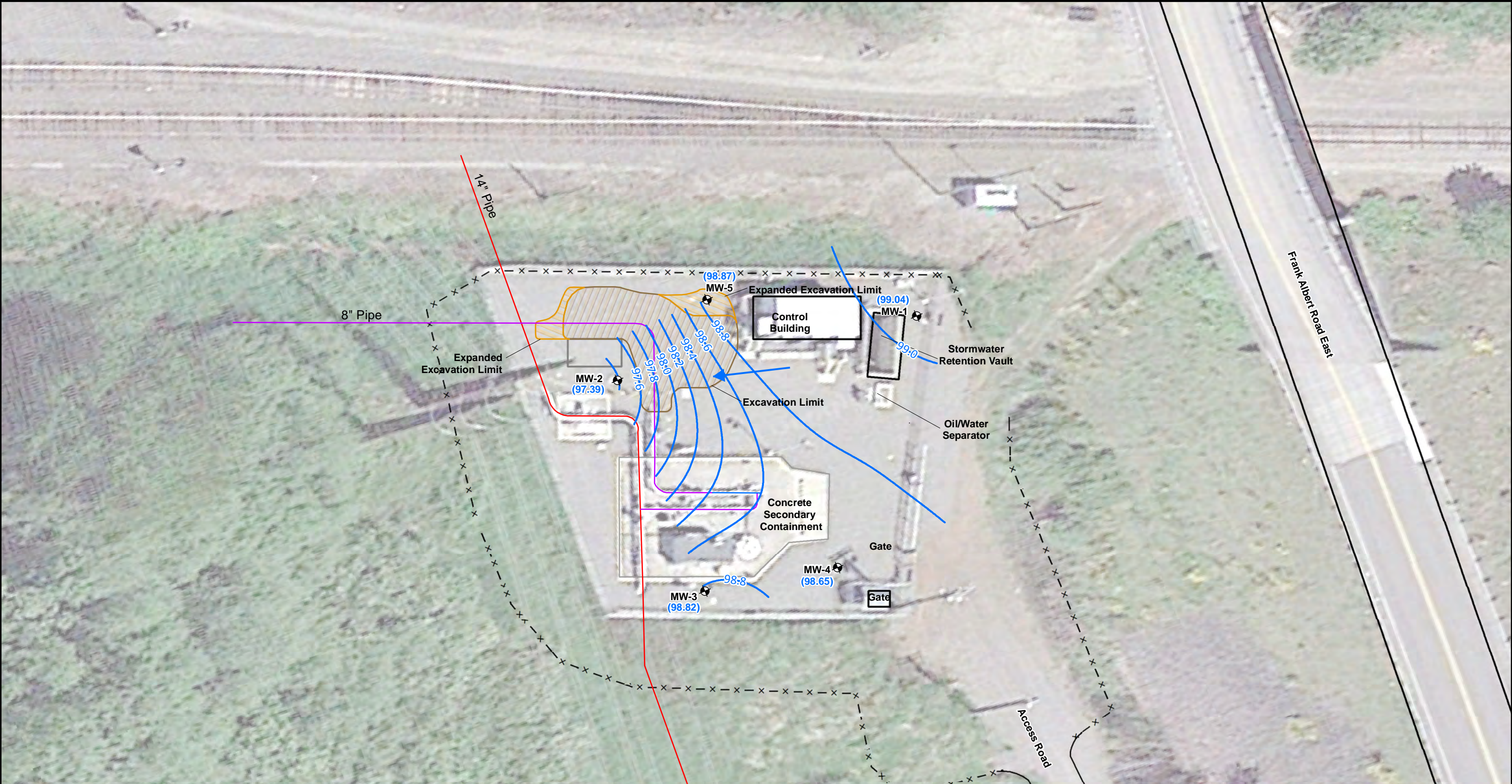


FIGURE 2

SITE MAP

OLYMPIC PIPE LINE COMPANY - TACOMA JUNCTION
2660 FRANK ALBERT ROAD EAST
FIFE, WA

PROJECT NO. WATAC/USA181	PREPARED BY MB	REF SCALE 1:360	
DATE 1/24/2019	REVIEWED BY FS	MAP SCALE 1 INCH = 30 FEET	



Legend

- Property Boundary
- x - x Fence
- Monitoring Well Location
- 14" Pipeline
- 10" Pipeline
- 8" Pipeline
- Original Excavation
- Expanded Excavation
- Groundwater Elevation Contour (ft)
- Inferred Groundwater Flow Direction
- (98.50) Groundwater Elevation Contour (ft)

Sources: 2015, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

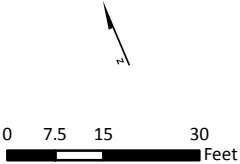


FIGURE 3

GROUNDWATER ELEVATION CONTOUR MAP

JANUARY 30, 2019

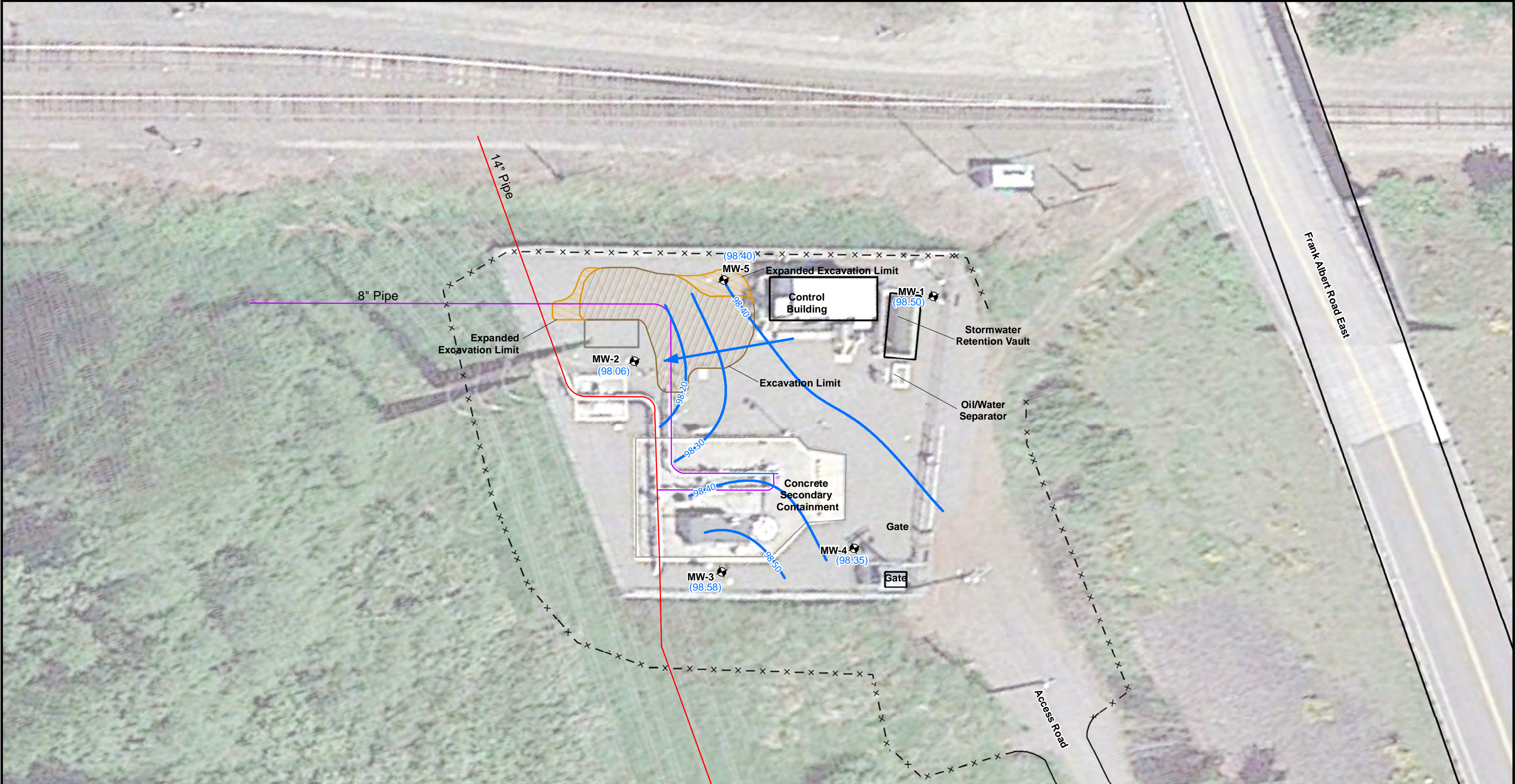
OLYMPIC PIPELINE COMPANY

TACOMA JUNCTION

2660 FRANK ALBERT ROAD, EAST

FIFE, WASHINGTON

PROJECT NO. WATACDF191	PREPARED BY DR	REF SCALE 1:360
DATE 5/28/2019	REVIEWED BY JS	MAP SCALE 1 INCH = 30 FEET



Legend

- × - ×

⊕

—

—

—

Property Boundary

Fence

Monitoring Well Location

14" Pipeline

10" Pipeline

8" Pipeline
- Original Excavation

Expanded Excavation

Groundwater Elevation Contour (ft)

Inferred Groundwater Flow Direction

Groundwater Elevation Contour (ft)

Sources: 2015, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

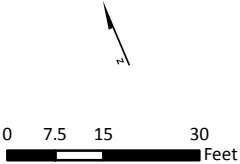


FIGURE 4

GROUNDWATER ELEVATION CONTOUR MAP

APRIL 24, 2019

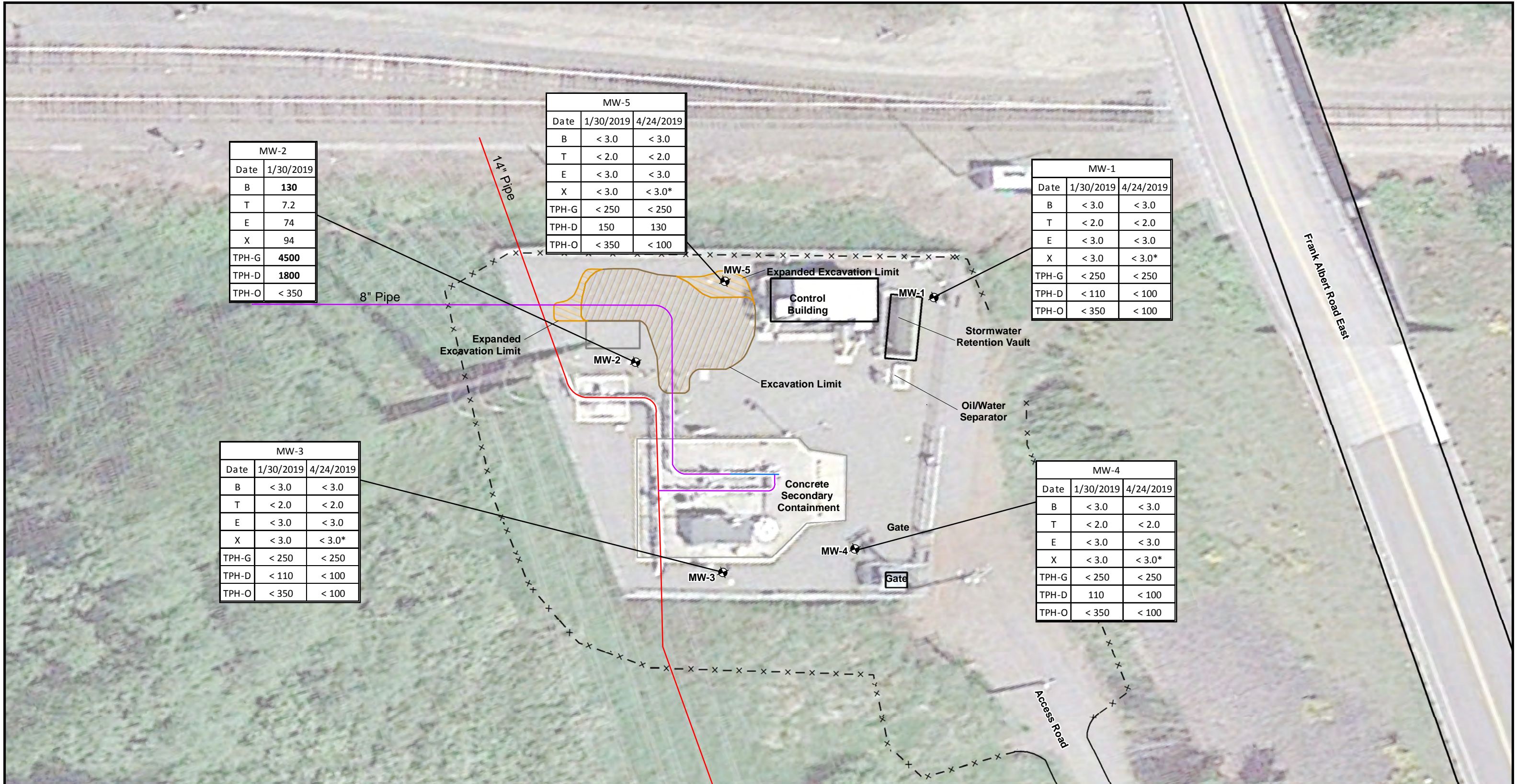
OLYMPIC PIPELINE COMPANY

TACOMA JUNCTION

2660 FRANK ALBERT ROAD, EAST

FIFE, WASHINGTON

PROJECT NO. WATACDF191	PREPARED BY DR/MSS	REF SCALE 1:360
DATE 7/25/2019	REVIEWED BY JS	MAP SCALE 1 INCH = 30 FEET



MW-2		
Date	1/30/2019	
B	130	
T	7.2	
E	74	
X	94	
TPH-G	4500	
TPH-D	1800	
TPH-O	< 350	

MW-5		
Date	1/30/2019	4/24/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0*
TPH-G	< 250	< 250
TPH-D	150	130
TPH-O	< 350	< 100

MW-1		
Date	1/30/2019	4/24/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0*
TPH-G	< 250	< 250
TPH-D	< 110	< 100
TPH-O	< 350	< 100

MW-3		
Date	1/30/2019	4/24/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0*
TPH-G	< 250	< 250
TPH-D	< 110	< 100
TPH-O	< 350	< 100

MW-4		
Date	1/30/2019	4/24/2019
B	< 3.0	< 3.0
T	< 2.0	< 2.0
E	< 3.0	< 3.0
X	< 3.0	< 3.0*
TPH-G	< 250	< 250
TPH-D	110	< 100
TPH-O	< 350	< 100

Legend

--- Property Boundary

x - x Fence

Monitoring Well Location

14" Pipeline

10" Pipeline

8" Pipeline

Original Excavation

Expanded Excavation

B - Benzene

T - Toluene

E - Ethylbenzene

X - Total Xylenes

TPH-G - Total petroleum hydrocarbons as gasoline

TPH-D - Total petroleum hydrocarbons as diesel

TPH-O - Total petroleum hydrocarbons as oil

< - Concentrations were not detected above the laboratory reporting limit

* - RPD of the LCS and LCSD exceeds the control limits. LCS or LCSD is outside acceptance limits.

All values in micrograms per liter (µg/L)

Sources: 2015, Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

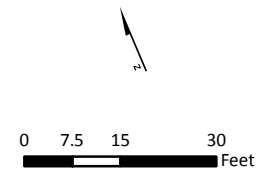


FIGURE 5

GROUNDWATER ANALYTICAL DATA MAP

JANUARY 30, 2019 AND APRIL 24, 2019

OLYMPIC PIPELINE COMPANY

TACOMA JUNCTION

2660 FRANK ALBERT ROAD, EAST

FIFE, WASHINGTON

PROJECT NO.
WATACDF191

PREPARED BY
DR

REF SCALE
1:360

DATE
5/28/2019

REVIEWED BY
JS

MAP SCALE
1 INCH = 30 FEET





Appendix A

Analytical Lab Reports and Chain-of-Custody Documentation



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-83637-1

Client Project/Site: BP - OPLC - Tacoma Junction
Sampling Event: OPLC-Tacoma Junction

For:

Antea USA, Inc.
4006 148th Ave NE
Redmond, Washington 98052

Attn: Megan Richard

M. Elaine Walker

Authorized for release by:
2/6/2019 2:10:59 PM

Elaine Walker, Project Manager II
(253)248-4972
elaine.walker@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1
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11

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the BPLAMP Technical Specifications, applicable federal, state, local regulations and certification requirements as well as the methodologies as described in laboratory SOPs reviewed by the BPLAMP. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The signature on the cover page extends to the case narrative and all the data and forms in the package. The Chain of Custody is included and is an integral part of this report.



Elaine Walker
Project Manager II
2/6/2019 2:10:59 PM

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Case Narrative

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Job ID: 580-83637-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative 580-83637-1

Receipt

Six samples were received on 1/31/2019 12:46 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): MW-3_20190130 (580-83637-3). The container labels list MW-4_20190130, while the COC lists MW-3_20190130. The client verified that all MW-4 ID's vials with a sample time of 1005 are actually MW-3 samples.

GC/MS VOA

Method(s) 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: MW-2_20190130 (580-83637-2). Elevated reporting limits (RLs) are provided.

Method(s) NWTPH-Gx: Surrogate recovery for the following sample was outside control limits: MW-2_20190130 (580-83637-2). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

Method(s) NWTPH-Dx: The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: MW-4_20190130 (580-83637-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: MW-1_20190130

Date Collected: 01/30/19 10:50

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			02/05/19 14:26	1
Toluene	ND		2.0		ug/L			02/05/19 14:26	1
Ethylbenzene	ND		3.0		ug/L			02/05/19 14:26	1
Xylenes, Total	ND		3.0		ug/L			02/05/19 14:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	96		80 - 120		02/05/19 14:26	1
Toluene-d8 (Surr)	107		80 - 122		02/05/19 14:26	1
1,2-Dichloroethane-d4 (Surr)	94		80 - 126		02/05/19 14:26	1
4-Bromofluorobenzene (Surr)	102		80 - 125		02/05/19 14:26	1
Dibromofluoromethane (Surr)	93		77 - 120		02/05/19 14:26	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			02/01/19 16:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	79		50 - 150		02/01/19 16:31	1
Trifluorotoluene (Surr)	113		50 - 150		02/01/19 16:31	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		02/05/19 08:42	02/05/19 17:44	1
Motor Oil (>C24-C36)	ND		350		ug/L		02/05/19 08:42	02/05/19 17:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	88		50 - 150	02/05/19 08:42	02/05/19 17:44	1

TestAmerica Seattle

Client Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: MW-2_20190130

Date Collected: 01/30/19 10:20

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-2

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	7.2		2.0		ug/L			02/05/19 14:52	1
Ethylbenzene	74		3.0		ug/L			02/05/19 14:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	96		80 - 120					02/05/19 14:52	1
Toluene-d8 (Surr)	103		80 - 122					02/05/19 14:52	1
1,2-Dichloroethane-d4 (Surr)	94		80 - 126					02/05/19 14:52	1
4-Bromofluorobenzene (Surr)	99		80 - 125					02/05/19 14:52	1
Dibromofluoromethane (Surr)	94		77 - 120					02/05/19 14:52	1

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	130		60		ug/L			02/05/19 20:40	20
Xylenes, Total	94		60		ug/L			02/05/19 20:40	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	98		80 - 120					02/05/19 20:40	20
Toluene-d8 (Surr)	106		80 - 122					02/05/19 20:40	20
1,2-Dichloroethane-d4 (Surr)	100		80 - 126					02/05/19 20:40	20
4-Bromofluorobenzene (Surr)	98		80 - 125					02/05/19 20:40	20
Dibromofluoromethane (Surr)	96		77 - 120					02/05/19 20:40	20

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	4500		250		ug/L			02/01/19 16:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	133		50 - 150					02/01/19 16:58	1
Trifluorotoluene (Surr)	167	X	50 - 150					02/01/19 16:58	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	1800		110		ug/L		02/05/19 08:42	02/05/19 18:06	1
Motor Oil (>C24-C36)	ND		350		ug/L		02/05/19 08:42	02/05/19 18:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	91		50 - 150				02/05/19 08:42	02/05/19 18:06	1

TestAmerica Seattle

Client Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: MW-3_20190130

Date Collected: 01/30/19 10:05

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-3

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			02/05/19 15:17	1
Toluene	ND		2.0		ug/L			02/05/19 15:17	1
Ethylbenzene	ND		3.0		ug/L			02/05/19 15:17	1
Xylenes, Total	ND		3.0		ug/L			02/05/19 15:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	97		80 - 120		02/05/19 15:17	1
Toluene-d8 (Surr)	109		80 - 122		02/05/19 15:17	1
1,2-Dichloroethane-d4 (Surr)	89		80 - 126		02/05/19 15:17	1
4-Bromofluorobenzene (Surr)	98		80 - 125		02/05/19 15:17	1
Dibromofluoromethane (Surr)	93		77 - 120		02/05/19 15:17	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			02/01/19 17:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	82		50 - 150		02/01/19 17:25	1
Trifluorotoluene (Surr)	106		50 - 150		02/01/19 17:25	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		02/05/19 08:42	02/05/19 18:27	1
Motor Oil (>C24-C36)	ND		350		ug/L		02/05/19 08:42	02/05/19 18:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	86		50 - 150	02/05/19 08:42	02/05/19 18:27	1

TestAmerica Seattle

Client Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: MW-4_20190130

Date Collected: 01/30/19 09:50

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-4

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			02/05/19 15:42	1
Toluene	ND		2.0		ug/L			02/05/19 15:42	1
Ethylbenzene	ND		3.0		ug/L			02/05/19 15:42	1
Xylenes, Total	ND		3.0		ug/L			02/05/19 15:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	99		80 - 120		02/05/19 15:42	1
Toluene-d8 (Surr)	106		80 - 122		02/05/19 15:42	1
1,2-Dichloroethane-d4 (Surr)	88		80 - 126		02/05/19 15:42	1
4-Bromofluorobenzene (Surr)	103		80 - 125		02/05/19 15:42	1
Dibromofluoromethane (Surr)	93		77 - 120		02/05/19 15:42	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			02/01/19 17:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	80		50 - 150		02/01/19 17:52	1
Trifluorotoluene (Surr)	116		50 - 150		02/01/19 17:52	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	110		110		ug/L		02/05/19 08:42	02/05/19 18:49	1
Motor Oil (>C24-C36)	ND		350		ug/L		02/05/19 08:42	02/05/19 18:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	95		50 - 150	02/05/19 08:42	02/05/19 18:49	1

TestAmerica Seattle

Client Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: MW-5_20190130

Date Collected: 01/30/19 10:35

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-5

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			02/05/19 16:07	1
Toluene	ND		2.0		ug/L			02/05/19 16:07	1
Ethylbenzene	ND		3.0		ug/L			02/05/19 16:07	1
Xylenes, Total	ND		3.0		ug/L			02/05/19 16:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	98		80 - 120		02/05/19 16:07	1
Toluene-d8 (Surr)	108		80 - 122		02/05/19 16:07	1
1,2-Dichloroethane-d4 (Surr)	97		80 - 126		02/05/19 16:07	1
4-Bromofluorobenzene (Surr)	103		80 - 125		02/05/19 16:07	1
Dibromofluoromethane (Surr)	99		77 - 120		02/05/19 16:07	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			02/01/19 18:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	79		50 - 150		02/01/19 18:20	1
Trifluorotoluene (Surr)	113		50 - 150		02/01/19 18:20	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	150		110		ug/L		02/05/19 08:42	02/05/19 19:11	1
Motor Oil (>C24-C36)	ND		350		ug/L		02/05/19 08:42	02/05/19 19:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	92		50 - 150	02/05/19 08:42	02/05/19 19:11	1

TestAmerica Seattle

Client Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: Trip Blank

Date Collected: 01/30/19 00:00

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-6

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			02/05/19 16:32	1
Toluene	ND		2.0		ug/L			02/05/19 16:32	1
Ethylbenzene	ND		3.0		ug/L			02/05/19 16:32	1
Xylenes, Total	ND		3.0		ug/L			02/05/19 16:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	98		80 - 120		02/05/19 16:32	1
Toluene-d8 (Surr)	106		80 - 122		02/05/19 16:32	1
1,2-Dichloroethane-d4 (Surr)	95		80 - 126		02/05/19 16:32	1
4-Bromofluorobenzene (Surr)	99		80 - 125		02/05/19 16:32	1
Dibromofluoromethane (Surr)	97		77 - 120		02/05/19 16:32	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			02/01/19 16:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	77		50 - 150		02/01/19 16:03	1
Trifluorotoluene (Surr)	107		50 - 150		02/01/19 16:03	1

QC Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-294164/5

Matrix: Water

Analysis Batch: 294164

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0		ug/L			02/05/19 10:17	1
Toluene	ND		2.0		ug/L			02/05/19 10:17	1
Ethylbenzene	ND		3.0		ug/L			02/05/19 10:17	1
Xylenes, Total	ND		3.0		ug/L			02/05/19 10:17	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Trifluorotoluene (Surr)	96		80 - 120		02/05/19 10:17	1
Toluene-d8 (Surr)	105		80 - 122		02/05/19 10:17	1
1,2-Dichloroethane-d4 (Surr)	92		80 - 126		02/05/19 10:17	1
4-Bromofluorobenzene (Surr)	101		80 - 125		02/05/19 10:17	1
Dibromofluoromethane (Surr)	100		77 - 120		02/05/19 10:17	1

Lab Sample ID: LCS 580-294164/6

Matrix: Water

Analysis Batch: 294164

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	10.3		ug/L		103	75 - 128
Toluene	10.0	11.0		ug/L		110	75 - 120
Ethylbenzene	10.0	10.8		ug/L		108	75 - 120
m-Xylene & p-Xylene	10.0	10.7		ug/L		107	75 - 120
o-Xylene	10.0	10.5		ug/L		105	74 - 120
Xylenes, Total	20.0	21.2		ug/L		106	74 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Trifluorotoluene (Surr)	96		80 - 120
Toluene-d8 (Surr)	102		80 - 122
1,2-Dichloroethane-d4 (Surr)	94		80 - 126
4-Bromofluorobenzene (Surr)	100		80 - 125
Dibromofluoromethane (Surr)	96		77 - 120

Lab Sample ID: LCSD 580-294164/7

Matrix: Water

Analysis Batch: 294164

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	10.1		ug/L		101	75 - 128	2	14
Toluene	10.0	10.9		ug/L		109	75 - 120	1	13
Ethylbenzene	10.0	10.1		ug/L		101	75 - 120	8	14
m-Xylene & p-Xylene	10.0	10.4		ug/L		104	75 - 120	3	14
o-Xylene	10.0	10.5		ug/L		105	74 - 120	0	16
Xylenes, Total	20.0	20.9		ug/L		105	74 - 120	1	15

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Trifluorotoluene (Surr)	96		80 - 120
Toluene-d8 (Surr)	102		80 - 122
1,2-Dichloroethane-d4 (Surr)	91		80 - 126

TestAmerica Seattle

QC Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-294164/7

Matrix: Water

Analysis Batch: 294164

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	99		80 - 125
Dibromofluoromethane (Surr)	98		77 - 120

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-294079/6

Matrix: Water

Analysis Batch: 294079

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		250		ug/L			02/01/19 13:25	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	81		50 - 150					02/01/19 13:25	1
Trifluorotoluene (Surr)	110		50 - 150					02/01/19 13:25	1

Lab Sample ID: LCS 580-294079/7

Matrix: Water

Analysis Batch: 294079

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1000	876		ug/L		88	79 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	83		50 - 150				
Trifluorotoluene (Surr)	117		50 - 150				

Lab Sample ID: LCSD 580-294079/8

Matrix: Water

Analysis Batch: 294079

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	1000	888		ug/L		89	79 - 120	1	10
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	83		50 - 150						
Trifluorotoluene (Surr)	117		50 - 150						

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-294143/1-A

Matrix: Water

Analysis Batch: 294210

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 294143

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		110		ug/L		02/05/19 08:42	02/05/19 16:38	1
Motor Oil (>C24-C36)	ND		350		ug/L		02/05/19 08:42	02/05/19 16:38	1

TestAmerica Seattle

QC Sample Results

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Surrogate	MB %Recovery	MB Qualifier	Limits
o-Terphenyl	79		50 - 150

Prepared	Analyzed	Dil Fac
02/05/19 08:42	02/05/19 16:38	1

Lab Sample ID: LCS 580-294143/2-A

Matrix: Water

Analysis Batch: 294210

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 294143

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	2000	1630		ug/L		82	50 - 120
Motor Oil (>C24-C36)	2000	1940		ug/L		97	64 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	80		50 - 150

Lab Sample ID: LCSD 580-294143/3-A

Matrix: Water

Analysis Batch: 294210

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 294143

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
#2 Diesel (C10-C24)	2000	1770		ug/L		88	50 - 120	8	26
Motor Oil (>C24-C36)	2000	2020		ug/L		101	64 - 120	4	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	102		50 - 150

TestAmerica Seattle

Lab Chronicle

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Client Sample ID: MW-1_20190130

Date Collected: 01/30/19 10:50

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	294164	02/05/19 14:26	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	294079	02/01/19 16:31	CJB	TAL SEA
Total/NA	Prep	3510C			294143	02/05/19 08:42	KO	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	294210	02/05/19 17:44	W1T	TAL SEA

Client Sample ID: MW-2_20190130

Date Collected: 01/30/19 10:20

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	294164	02/05/19 14:52	CJ	TAL SEA
Total/NA	Analysis	8260C	DL	20	294164	02/05/19 20:40	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	294079	02/01/19 16:58	CJB	TAL SEA
Total/NA	Prep	3510C			294143	02/05/19 08:42	KO	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	294210	02/05/19 18:06	W1T	TAL SEA

Client Sample ID: MW-3_20190130

Date Collected: 01/30/19 10:05

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	294164	02/05/19 15:17	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	294079	02/01/19 17:25	CJB	TAL SEA
Total/NA	Prep	3510C			294143	02/05/19 08:42	KO	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	294210	02/05/19 18:27	W1T	TAL SEA

Client Sample ID: MW-4_20190130

Date Collected: 01/30/19 09:50

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	294164	02/05/19 15:42	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	294079	02/01/19 17:52	CJB	TAL SEA
Total/NA	Prep	3510C			294143	02/05/19 08:42	KO	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	294210	02/05/19 18:49	W1T	TAL SEA

Client Sample ID: MW-5_20190130

Date Collected: 01/30/19 10:35

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	294164	02/05/19 16:07	CJ	TAL SEA

TestAmerica Seattle

Lab Chronicle

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	NWTPH-Gx		1	294079	02/01/19 18:20	CJB	TAL SEA
Total/NA	Prep	3510C			294143	02/05/19 08:42	KO	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	294210	02/05/19 19:11	W1T	TAL SEA

Client Sample ID: Trip Blank

Date Collected: 01/30/19 00:00

Date Received: 01/31/19 12:46

Lab Sample ID: 580-83637-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	294164	02/05/19 16:32	CJ	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	294079	02/01/19 16:03	CJB	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

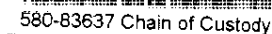
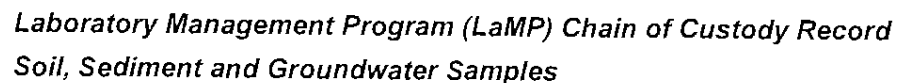
Analysis Method	Prep Method	Matrix	Analyte
8260C		Water	Xylenes, Total

Sample Summary

Client: Antea USA, Inc.
Project/Site: BP - OPLC - Tacoma Junction

TestAmerica Job ID: 580-83637-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-83637-1	MW-1_20190130	Water	01/30/19 10:50	01/31/19 12:46
580-83637-2	MW-2_20190130	Water	01/30/19 10:20	01/31/19 12:46
580-83637-3	MW-3_20190130	Water	01/30/19 10:05	01/31/19 12:46
580-83637-4	MW-4_20190130	Water	01/30/19 09:50	01/31/19 12:46
580-83637-5	MW-5_20190130	Water	01/30/19 10:35	01/31/19 12:46
580-83637-6	Trip Blank	Water	01/30/19 00:00	01/31/19 12:46



Rush TAT Yes No X

Lab Work Order Number:

Loc: 580
83637

Therm. ID: A2 Cor: 3.4 Unc: 3.6
Cooler Desc: 6 B 1/2
Packing: B, b 1/2 FedEx: _____
Cust. Seal: Yes ☒ No _____ UPS: _____
Blue Ice, Wet, Dry, None Lab Cour: ☒
Other: _____

Special Instructions:									
THIS LINE - LAB USE ONLY: Custody Seals in Place: Yes / No Temp Blank: Yes / No Cooler Temp on Receipt: _____ °F/C Trip Blank: Yes / No MS/MSD Sample Submitted: Yes / No									

BP LaMP Soil/H₂O COC July 2018

Temperature readings: _____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u> pH	<u>Preservative</u> Added (mls)	<u>Lot #</u>
MW-1_20190130	580-83637-A-1	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-1_20190130	580-83637-B-1	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-2_20190130	580-83637-A-2	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-2_20190130	580-83637-B-2	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-3_20190130	580-83637-A-3	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-3_20190130	580-83637-B-3	Amber Glass 250mL - hydrochloric	<u>1.5</u>	_____	0312801D-580
MW-4_20190130	580-83637-A-4	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-4_20190130	580-83637-B-4	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580
MW-5_20190130	580-83637-A-5	Amber Glass 250mL - hydrochloric	<u>1.0</u>	_____	0312801D-580
MW-5_20190130	580-83637-B-5	Amber Glass 250mL - hydrochloric	<u>0.5</u>	_____	0312801D-580

Client: Antea USA, Inc.

Job Number: 580-83637-1

Login Number: 83637

List Number: 1

Creator: Hobbs, Kenneth F

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	IDs on containers do not match the COC. Logged in per COC.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	