



January 21, 2019

Mr. Steve Teel
Site Manager/Hydrogeologist
Washington State Department of Ecology
Toxics Cleanup Program, Southwest Regional Office
P.O. Box 47775
Olympia, Washington 98504-7775

**Subject: Groundwater Monitoring Report, November 2018
CenturyLink Longview Facility
1305 Washington Way, Longview, Washington 98632**

Dear Mr. Teel:

This letter provides a summary of the groundwater sampling event conducted on November 16, 2018. Groundwater monitoring events are being conducted as a continuation of the Groundwater Monitoring Plan developed in 2008 under the Voluntary Cleanup Program. Groundwater monitoring was conducted in accordance with the Final Direct-Push Sampling Plan, dated March 2, 2015, and approved by Washington State Department of Ecology (Ecology).

Groundwater Levels

The depth to groundwater was measured using an electronic static water level indicator that was lowered into each well. Depth to groundwater was measured to the nearest hundredth of a foot from the top of the well casing. Static water levels ranged from 1.58 to 3.02 feet above mean sea level (amsl) and are summarized in the table below and shown on Figure 1. Groundwater levels were approximately 1.2 to 2.5 feet higher than observed in May 2017.

NOVEMBER 16, 2018 GROUNDWATER ELEVATIONS

Location	Surveyed Top of Casing (ft amsl)	November 16, 2018 Depth to Water (ft)	November 16, 2018 Groundwater Elevation (ft amsl)
MW-01	15.64	13.23	2.41
MW-02	16.17	13.15	3.02
MW-03	15.02	12.62	2.40
MW-04	14.55	12.97	1.58
MW-05	14.75	12.49	2.26

Notes:
ft Feet
ft amsl Feet above mean sea level

Based on groundwater level data shown on Figure 1, the direction of groundwater flow appears to be toward the north, with a gradient of approximately 0.015 foot per foot. Historically, groundwater flow direction has typically ranged from west to northwest. Sitewide groundwater levels during this

event are less uniform and there is a steeper than normal gradient, possibly resulting from early November 2018 precipitation and uneven infiltration rates.

Groundwater Sample from Permanent Monitoring Wells

Groundwater samples were obtained from all five permanent monitoring wells at the facility on November 16, 2018 and a duplicate sample was collected from well MV-02. After groundwater level measurements were documented, field personnel collected groundwater samples using a peristaltic pump. New dedicated tubing was used to collect the sample at each well. In accordance with the work plan, low-flow sampling procedures were used. Sampling flow rates were 150 milliliters per minute for purging and groundwater sample collection.

A calibrated YSI 600 multi-probe water meter was used to measure field parameters during well purging, and before and after sampling. A HACH 2100Q meter was used to measure turbidity. Water quality parameters measured with the YSI 600 included pH, dissolved oxygen, oxidation-reduction potential, and specific conductance. Low-flow pumping continued until field parameters stabilized within acceptable parameter limits before samples were collected. Attachment A includes the logs of field parameters measured during the low-flow sampling.

Groundwater Sample Analysis

Once obtained, groundwater samples were labeled in accordance with Tetra Tech, Inc. (Tetra Tech) standard operating procedures, placed in a cooler, and chilled to below 4 degrees Celsius. Samples were delivered directly to ALS Laboratories (ALS), located at 1317 S. 13th Avenue in Kelso, Washington. Samples were delivered following standard chain-of-custody protocol. Chain-of-custody forms are included with the laboratory data packages in Attachment B.

ALS analyzed the samples for total petroleum hydrocarbons-diesel (TPH-DRO) and total petroleum hydrocarbons-residual range organics (TPH-RRO) by Method Northwest Total Petroleum Hydrocarbons-Diesel Extended Range (Ecology 1997), without silica gel cleanup. ALS also analyzed the samples for polycyclic aromatic hydrocarbons (PAH) by modified U.S. Environmental Protection Agency Method 625-Selected Ion Monitoring. The samples were filtered with a 0.7-micron (μm) filter before analysis by the PAH method.

Groundwater Sample Analytical Results

Table 1 presents analyte concentrations for the sample analyses of permanent groundwater wells sampled during the November 16, 2018 event. Low concentrations of TPH-DRO were detected in samples from the wells; concentrations ranged from 48 to 96 micrograms per liter ($\mu\text{g/L}$). Concentrations in all five monitoring wells were below the Washington Model Toxic Control Act (MTCA) Method A cleanup level for groundwater of 500 $\mu\text{g/L}$.

TPH-RRO was detected in all five wells, ranging from 110 to 380 $\mu\text{g/L}$. Concentrations from all five wells were below the 500 $\mu\text{g/L}$ TPH-RRO MTCA Method A cleanup level for groundwater.

Most of the TPH-DRO and TPH-RRO detections have an associated J qualifier which indicates the concentration is estimated because the constituent was detected below the reporting limit, but above the method detection limit.

The laboratory method blank contained TPH-DRO at a concentration of 17 $\mu\text{g/L}$ with a J qualifier and TPH-RRO at 50 $\mu\text{g/L}$ with a J qualifier. These detections could be used to revise and lower the reported concentrations for the field samples, but such revisions would not significantly affect the results or change the conclusions in this report.

Low concentrations of PAHs were detected in all monitoring wells; Table 1 summarizes these results. There are no total PAH or compound-specific MTCA Method A cleanup levels for PAHs. The MTCA Method A cleanup level of 0.1 µg/L for PAHs is based on the benzo(a)pyrene toxic equivalent quotient (BaP TEQ). Table 1 also shows the BaP TEQ results, which are based on the individual PAH analytical results in Appendix B. The BaP TEQ results ranged from 0.00019 to 0.00026 µg/L, well below the MTCA Method A cleanup level.

Table 2 summarizes the historical results for DRO and RRO for each well. Table 3 summarizes the historical results for BaP TEQ for each well.

Conclusions and Recommendations

For this sole sampling event of 2018, analytical results for samples from all five wells were below MTCA Method A cleanup levels for BaP TEQ, TPH-DRO, and TPH-RRO.

The results from November 2018 were similar to previous fall and late summer season sample results, when all concentrations were below the 500 µg/L cleanup level for TPH-DRO and TPH-RRO. Continued low groundwater TPH concentrations at downgradient wells MW-04 and MW-05 indicate that the TPH plume is stable and not migrating downgradient at significant concentrations.

Tetra Tech recommends that groundwater sampling at the five monitoring wells continue every 18 months to monitor plume stability and continued attenuation of contaminant concentrations to below MTCA Method A cleanup levels. These groundwater sampling events would alternate between spring and fall to obtain groundwater concentration data from high and low groundwater conditions, respectively. This monitoring schedule was discussed with you during our March 22, 2017 teleconference. Accordingly, the next groundwater monitoring events will be conducted in spring 2020 and fall 2021.

If you have any questions or concerns, please contact me at (303) 312-8856 or david.berestka@tetrattech.com.

Sincerely,



David Berestka, P.E.
Project Manager
Tetra Tech, Inc.

cc: Ed Clement, Regional Environmental Health and Safety Manager, CenturyLink
Mark Reisig, Tetra Tech Program Manager

Attachments:

- A Low-Flow Groundwater Sampling Parameter Forms
- B Laboratory Analytical Reports and Chain-of-Custody Records

ANALYTICAL RESULTS TABLES

TABLE 1
GROUNDWATER SAMPLE ANALYTICAL RESULTS
CENTURYLINK LONGVIEW, WASHINGTON FACILITY

Analyte		TPH-DRO	TPH-RRO	Total PAH	BaP TEQ
MTCA Method A Cleanup Level		500 (µg/L)	500 (µg/L)	NA	0.1 (µg/L)
Location	Date				
MW-01	11/16/2018	48 J	130J	0.039	0.00020
MW-02	11/16/2018	96 J	140 J	0.098	0.00021
MW-02 DUP	11/16/2018	93 J	140 J	0.107	0.00026
MW-03	11/16/2018	61 J	240 J	0.044	0.00020
MW-04	11/16/2018	60 J	110 J	0.794	0.00023
MW-05	11/16/2018	77 J	380 J	0.068	0.00019

Notes:

All concentrations in micrograms per liter (µg/L)

BaP TEQ Benzo(a)Pyrene Toxic Equivalent Quotient
 J Data qualifier indicating that the result is an estimated quantity below the reporting limit
 MTCA Model Toxics Control Act Method A for groundwater
 NA Not applicable (no applicable MTCA standard)
 PAH Polycyclic aromatic hydrocarbon
 TPH-DRO Total petroleum hydrocarbons diesel range organics
 TPH-RRO Total petroleum hydrocarbons residual range organics

TABLE 2
HISTORICAL GROUNDWATER SAMPLE RESULTS – DRO AND RRO
CENTURYLINK LONGVIEW, WASHINGTON FACILITY

Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
TPH-DRO (MTCA Method A Cleanup Level = 500 µg/L)	3/25/1992	Bailer	82	112	<50	--	--
	12/16/2003	Bailer	<250	<250	<250	--	--
	8/10/2006	Bailer	<50	140	<50	--	--
	9/23/2008	Bailer	--	--	--	<50	140
	2/26/2010	Bailer	--	--	--	<25	100
	9/2/2011	Bailer	--	--	--	73	120
	2/26/2013	Bailer	--	--	--	1,700	<51
	6/3/2013	Bailer	<50	66	<50	210	<50
	12/5/2013	Bailer	97	72	47	1,500	100
	3/27/2014	Bailer	63	87	<250	550	47
	6/25/2014	Bailer	50	33	<260	1,100	<260
	9/10/2014	Bailer	240	90	36	790	48
	3/5/2015	Low Flow	22	82	20	20	27
	7/20/2015	Low Flow	22	77	21	24	30
	12/18/15	Low Flow	38	83	46	96	120
	3/31/16	Low Flow	41	1,500	58	30	30
	7/7/2016	Low Flow	24	330	22	34	21
	10/13/2016	Low Flow	23	130	39	39	48
	12/09/2016	Low Flow	37	120	63	70	67
	5/04/2017	Low Flow	42	570	47	24	23
	11/16/2018	Low Flow	48	96	61	60	77
TPH-RRO (MTCA Method A Cleanup Level = 500 µg/L)	3/25/1992	Bailer	<200	<200	<200	--	--
	8/10/2006	Bailer	<250	<250	<250	--	--
	9/23/2008	Bailer	--	--	--	<250	<250
	2/26/2010	Bailer	--	--	--	140	200
	9/2/2011	Bailer	--	--	--	350	210
	2/26/2013	Bailer	--	--	--	11,000	220
	6/3/2013	Bailer	150	<100	<100	1,600	<100
	12/5/2013	Bailer	440	120	120	11,000	170
	3/27/2014	Bailer	370	63	<500	3,900	190
	6/25/2014	Bailer	340	62	21	8,400	51
	9/10/2014	Bailer	1,500	140	120	6,600	82
	3/5/2015	Low Flow	43	70	37	48	53
	7/20/2015	Low Flow	52	71	49	52	42
	12/18/15	Low Flow	84	160	81	81	82
	3/31/16	Low Flow	83	340	110	54	53
	7/7/2016	Low Flow	44	140	41	33	34
	10/13/2016	Low Flow	94	130	98	90	100
	12/09/2016	Low Flow	140	180	130	110	110
	5/04/2017	Low Flow	86	200	54	37	31
	11/16/2018	Low Flow	130	140	240	110	380

Notes:

All concentrations in micrograms per liter (µg/L)

Bold values indicate exceedance of the MTCA Method A Cleanup Level

For wells with duplicate samples, the highest value reported is shown for each constituent

MTCA Model Toxics Control Act Method A for groundwater

TPH-DRO Total petroleum hydrocarbons diesel range organics

TPH-RRO Total petroleum hydrocarbons residual range organics

-- Not sampled

< 0.01 Concentration is less than the method detection limit shown

TABLE 3
HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS –
BAP TEQ AND TOTAL PAH
CENTURYLINK LONGVIEW, WASHINGTON FACILITY

Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
BaP TEQ Unfiltered analysis (MTCA Method A Cleanup Level = 0.1 µg/L)	6/3/2013	Bailer	2.2	< 0.1	< 0.1	0.36	< 0.1
	12/5/2013	Bailer	0.20	0.027	0.074	1.4	0.0062
	3/27/2014	Bailer	0.37	0.080	0.049	0.27	0.073
	6/25/2014	Bailer	0.39	0.012	0.00033	0.40	0.0054
	9/10/2014	Bailer	0.14	0.090	0.0037	0.39	0.0051
BaP TEQ Filtered analysis (MTCA Method A Cleanup Level = 0.1 µg/L)	12/5/2013	Bailer	0.00033	--	0.00068	0.00084	--
	3/27/2014	Bailer	< 0.019	< 0.019	--	< 0.019	< 0.019
	6/25/2014	Bailer	< 0.020	--	--	< 0.200	--
	9/10/2014	Bailer	0.00030	0.00027	--	< 0.020	--
	3/5/2015	Low Flow	0.00074	0.00038	< 0.019	0.00044	0.00029
	7/20/2015	Low Flow	0.00029	< 0.020	< 0.021	< 0.021	< 0.021
	12/18/2015	Low Flow	0.0065	0.00029	< 0.019	0.00050	0.00039
	3/31/2016	Low Flow	0.00035	< 0.020	< 0.020	0.00026	< 0.020
	7/7/2016	Low Flow	< 0.020	< 0.020	0.00027	0.00035	< 0.020
	10/13/2016	Low Flow	<0.0026	<0.0026	0.00028	0.00040	0.00041
	12/09/2016	Low Flow	0.00028	<0.020	0.00032	0.00032	<0.020
	5/04/2017	Low Flow	0.00026	<0.020	0.00020	0.00023	0.00024
	11/16/2018	Low Flow	0.00020	0.00026	0.00020	0.00023	0.00019
Total PAH Unfiltered analysis (No MTCA Method A Cleanup Level)	6/3/2013	Bailer	16	1.6	< 0.1	8.7	< 0.1
	12/5/2013	Bailer	1.7	0.83	0.85	16	2.4
	3/27/2014	Bailer	3.5	1.3	0.50	3.1	0.80
	6/25/2014	Bailer	3.9	2.3	0.12	4.8	0.37
	9/10/2014	Bailer	1.2	1.5	0.049	6.0	5.5
Total PAH Filtered analysis (No MTCA Method A Cleanup Level)	12/5/2013	Bailer	0.028	--	0.043	0.52	--
	3/27/2014	Bailer	0.018	0.21	--	0.080	0.064
	6/25/2014	Bailer	0.063	--	--	0.11	--
	9/10/2014	Bailer	0.012	0.041	--	0.42	--
	3/5/2015	Low Flow	0.046	0.58	0.013	0.24	0.26
	7/20/2015	Low Flow	0.0077	0.019	0.0056	0.29	0.15
	12/18/2015	Low Flow	0.039	1.9	< 0.019	9.7	8.5
	3/31/2016	Low Flow	0.0035	0.032	< 0.020	0.041	0.0092
	7/7/2016	Low Flow	< 0.020	0.019	0.0092	2.2	0.024
	10/13/2016	Low Flow	0.0083	0.034	0.016	0.68	2.8
	12/09/2016	Low Flow	0.0028	0.0070	0.029	4.7	1.1
	5/04/2017	Low Flow	0.015	0.70	0.01	0.017	0.0096
	11/16/2018	Low Flow	0.039	0.107	0.044	0.794	0.068

Notes:

All concentrations in micrograms per liter (µg/L)

Bold values indicate exceedance of the MTCA Cleanup Level

For wells with duplicate samples, the highest value reported is shown for each constituent

BaP TEQ Benzo(a)Pyrene Toxic Equivalent Quotient

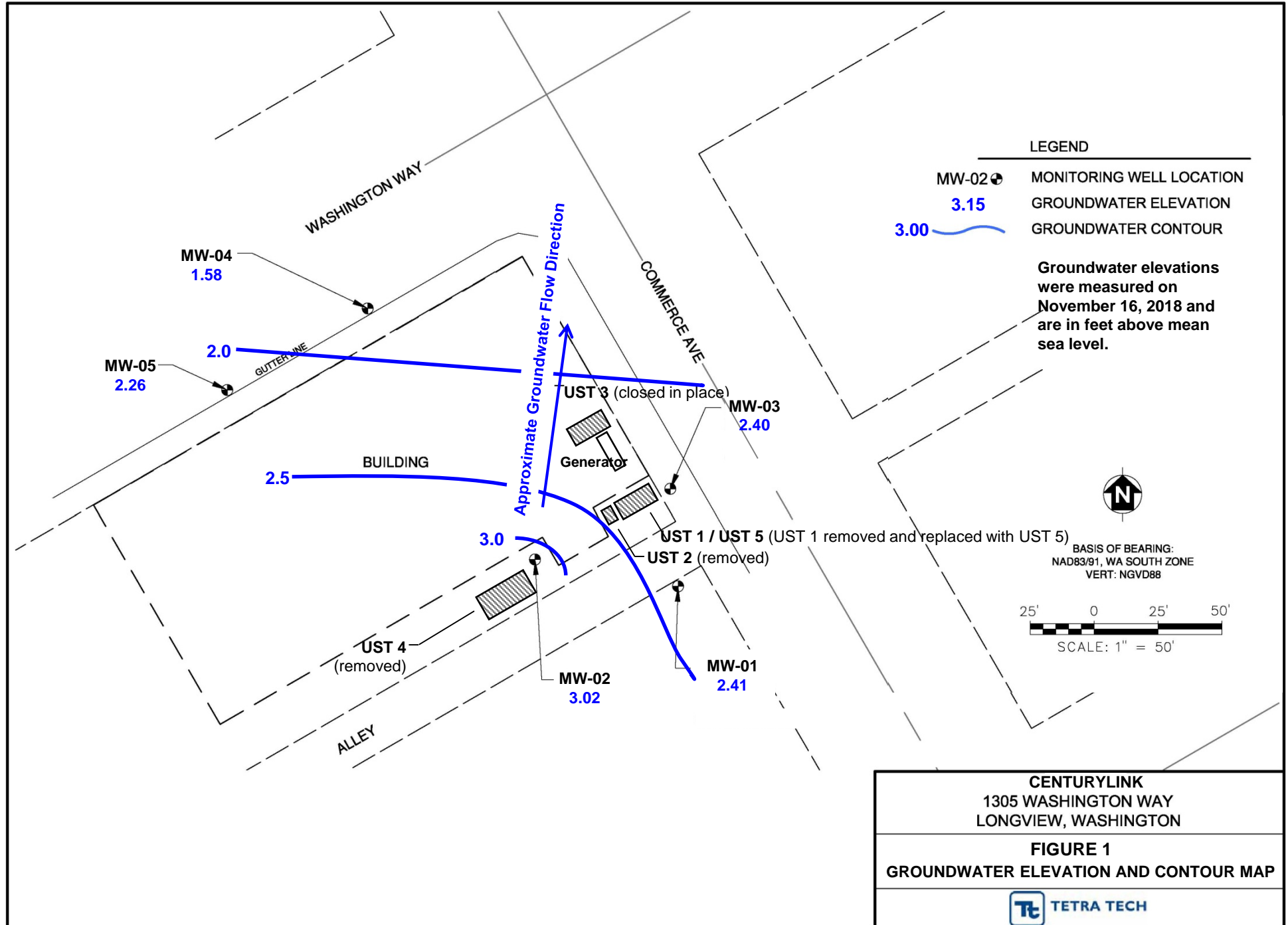
MTCA Model Toxics Control Act Method A for groundwater

PAH Polycyclic aromatic hydrocarbon

-- Not analyzed

< 0.01 Concentration is less than the method detection limit shown

FIGURE



ATTACHMENT A
FIELD NOTES AND LOW-FLOW GROUNDWATER SAMPLING PARAMETER FORMS



94278

SR#

COC Set 1 of 1

COC#

Page 1 of 1

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 677-7222 / 800-695-7222 / FAX (360) 636-1068
www.asglobal.com

Report Requirements

- ☐ I. Routine Report: Method Blank, Surrogate, as required
- ☐ II. Report Dup., MS, MSD as required
- ☐ III. CLP Like Summary (no raw data)
- ☐ IV. Data Validation Report
- ☐ V. EDD **VERIFY w/**

Invoice Information

P.O.# 1159337

Bill To: **PM**

Turnaround Requirements

☐ 24 hr
☐ 5 Day
☒ Standard

Wavelength (nm)	Percent Transmittance
215	100
220	100
230	100
240	100
250	100
260	100
270	100
280	100
290	100
300	100
310	100
320	100
330	100
340	100
350	100
360	100
370	100
380	100
390	100
400	100
410	100
420	100
430	100
440	100
450	100
460	100
470	100
480	100
490	100
500	100
510	100
520	100
530	100
540	100
550	100
560	100
570	100
580	100
590	100
600	100
610	100
620	100
630	100
640	100
650	100
660	100
670	100
680	100
690	100
700	100
710	100
720	100
730	100
740	100
750	100
760	100
770	100
780	100
790	100
800	100
810	100
820	100
830	100
840	100
850	100
860	100
870	100
880	100
890	100
900	100
910	100
920	100
930	100
940	100
950	100
960	100
970	100
980	100
990	100
1000	100

Circle which metals are to be analyzed

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg

Special Instructions/Comments:

*Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other (Circle One)

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature <i>[Signature]</i>	Signature <i>[Signature]</i>	Signature	Signature	Signature	Signature
Printed Name SCOTT M DUZAN	Printed Name Jeffrey M. Smith	Printed Name	Printed Name	Printed Name	Printed Name
Firm TETRA TECH	Firm A/S Engineering	Firm	Firm	Firm	Firm
Date/Time 1/4/02	Date/Time 1/10/02	Date/Time	Date/Time	Date/Time	Date/Time

FIELD ACTIVITY DAILY LOG

Subject: Fall 2018 GWN

Project Name: LTL LONVIEW

Project No.: 103P3080237.01

Location: 1305 WASHINGTON WAY, LONVIEW, WA

Weather Conditions: CLOUDY w/ LIGHT SHOWERS Date: 11.16.18

Page 1 of 3 Pages

Time	Description Of Activities:				
0325	Arrive on-site. Setup traffic control measures at MW-3 and MW-4.				
0340	Prep and unload equipment.				
0415	Setup for Well graving				
0440	MWS	TD: 19.63'	Dir: 12.49'	2"Ø	Water in Mant
0453	MW4	19.73'	12.97'	"	"
0516	MW3	19.93'	12.62'	"	No Water in Mant
0530	MW1	19.59'	13.23'	4"Ø	"
0556	MW2	19.93'	13.15	2"Ø	"
0650	Prep for Sampling. Calibrate YSI's Hach.				
0705	① Specific Conductivity [1.413 mS/cm] 14.82°C, 2.299 mS/cm → 1.438				
0715	② pH [7.0] 15.37°C, 8.61 pH → 7.21				
0725	③ pH [4.0] 15.13°C, 2.77 pH → 3.81				
0735	④ pH [10.0] 15.11°C, 9.85 pH → 9.96				
0745	⑤ ORP [240.0 mV] 14.89°C, 248.7 mV → 241.2				
0755	⑥ DO [100.0% saturated], 11.59°C, 87.7% sat → 97.8				
0810	⑦ Turbidity [20 NTU] 19.8 NTU				
0813	⑧ Turbidity [100 NTU] 99.8 NTU				

Tetra Tech Personnel On Site:

SD

Visitor(s) On Site:

Telephone Call(s):

NA

Comments:

NA

Tetra Tech Representative:

SD

Signature:

[Signature]

FIELD ACTIVITY DAILY LOG

Subject: SAME

Project Name: SAME

Location: SAME

Project No.: SAME

Weather Conditions: SAME

Date: 11.16.18 Page 2 of 3 Pages

Time	Description Of Activities:
0816	(9) Turbidity [800 NTU] 792 NTU
0819	(9) Turbidity [10 NTU] 9.88 NTU
0830	Prep for Sampling. Setup Pump & Flow Through Cell. Pump setup Vertical Hatch & 150 mL/min.
0900	Start Purging MW-05
0940	Sample collected: MW-05 (3 Ambers)
1000	Demob from MW-05. Setup & prep at MW-04
1025	Finish prep.
1044	Start Purging MW-04.
1125	Sample collected: MW-04 (3 Ambers)
1145	Demob from MW-04. Depart site for gas and take lunch.
1238	Return. Mob to MW-03. Recalibrate HACH (16.3, 105, 809 NTU)
1320	Start Purging MW-03.
1410	Sample collected: MW-03 (3 Ambers)
1430	Demob from MW-03. Setup & prep at MW-01
1503	Start Purging MW-01
1545	Sample collected: MW-01 (3 Ambers)

Tetra Tech Personnel On Site:

SD

Visitor(s) On Site:

NA

Telephone Call(s):

NA

Comments:

NA

Tetra Tech Representative:

SD

Signature:

[Signature]

FIELD ACTIVITY DAILY LOG

Subject: SAME

Project Name: SAME

Location: SAME

Project No.: SAME

Weather Conditions: SAME

Date: 11.16.18 Page 3 of 3 Pages

Time	Description Of Activities:
1600	Demob from MW-01. Transfer ^{today's} existing purge water from 5-gal buckets to empty 55-gal steel drum. Located on SE corner of bldg (near former VST-2).
1610	Setup & prep at MW-02
1633	Start Purging MW-02
1735	Sample collected: MW-02 (3 Ambers)
1742	Sample collected: Dup 11.16.18 [Blind Dup from MW-02] (3 Ambers)
1753	Sample collected: NS [Blind from MW-02] (3 Ambers)
1800	Sample collected: MSD [Blind from MW-02] (3 Ambers)
1810	Begin cleanup and pack-up.
1850	Prep sample coolers.
1710	Exit site to procure more ice for sample coolers.
1720	Load up sample coolers and depart for lab.
1728	Arrive @ lab. Call for sample receiving. Wait.
1742	Transfer samples to lab and get copy of COC.
1750	Depart lab for return trip to Seattle.

Tetra Tech Personnel On Site:

SD

Visitor(s) On Site:

NA

Telephone Call(s):

ANSEN

Comments:

NA

Tetra Tech Representative:

SD

Signature:

[Signature]



Project Name: CTL LONGVIEW
Project Number: 103P3080237.01
Laboratory: AUS ENV

LOW FLOW GROUNDWATER SAMPLING FORM

Well No: MMY-01
Sampled by: SD
Date: 11-16-18 Time: 1450

Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ Steel ☐ Other
Monitoring Point Description (Notch, N, etc):

PURGE VOLUME
Casing Diameter, D (inches) 4"
Total Depth of Casing TD (in feet) 19.59'
Depth to Oil below TOC NA
Depth to Water below TOC, WTL (in feet) 13.23'
Pump Intake (in feet) 16'

PURGE METHOD
☐ Baker-Type
☐ Submersible Pump ☐ Jetting ☐ Bladder ☐ Other
☒ Other-Specify: PERISTALTIC
Volume of Oil Removed: NA gallons

PURGE TIME
Start Time: 1503 Stop Time: 1545 Elapsed Time: 42
Pump Settings (Cycles): 150 ml/m

PURGE RATE
Initial: 150 ml/m Final: 150 ml/m

ACTUAL PURGE VOLUME
1.8 gallons

FIELD PARAMETERS

Time (24hr)	Discharge Rate (ml/m)	Volume Purged (ml)	DO (%)	pH (pH unit)	ORP (mV)	Temperature (°F or °C)	Spec. Cond. (mS/cm)	Turbidity (NTU)	Notes
1503	150	0	73.2	6.70	107.0	15.38	0.160	18.1	TURBID
1506	150	450	17.9	6.56	115.3	15.52	0.165	18.5	"
1509	150	900	16.9	6.53	116.8	15.54	0.166	17.6	"
1512	150	1350	14.4	6.54	117.9	15.30	0.165	18.1	"
1515	150	1800	12.9	6.53	119.0	15.50	0.166	16.3	"
1518	150	2250	10.6	6.53	117.7	15.48	0.167	16.1	"
1521	150	2700	10.0	6.53	118.8	15.50	0.167	15.7	"
1524	150	3150	9.8	6.52	118.1	15.49	0.167	16.2	CLEARING UP
1527	150	3600	9.3	6.52	116.7	15.49	0.166	15.8	"
1530	150	4050	9.2	6.52	113.2	15.49	0.169	16.0	"

Stabilization Criteria: $\pm 10\%$ ± 0.1 ± 10 mV $\pm 1^\circ$ $\pm 3\%$ $\pm 10\%$

Field Equipment

Pump Info (Make / Model Serial #):	SAME ↓
WQ Meter 1 Info (Make / Model Serial #):	
WQ Meter 2 Info (Make / Model Serial #):	
Turbidity Meter Info (Make / Model Serial #):	
Water Level Meter Info (Make / Model Serial #):	
Equipment Provider:	Pine Environmental Services, Inc.

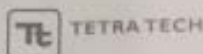
Condition of water during purging (turbidity, color, odor): TURBID w/ BLACK-BEY SEDIMENT
Other Notes:
Condition of well: LOTS OF SEDIMENT IN MOUNTAIN, SLIGHT COR
Purge Water Disposal: RAIN
Post Purging Depth to Water below TOC, FWL (in feet) 13.25'

WELL SAMPLING METHOD

☒ Same as for Purging ☐ Other - describe

* 1545 2 500 ml Amber
1 500 ml Amber HCl

Page: 1 of 1



Project Name: CTE LONGVIEW
Project Number: 103P3080237.01
Laboratory: ALS ENV

LOW FLOW GROUNDWATER SAMPLING FORM

Well No: MW-02
Sampled by: SD
Date: 11.16.18 Time: 1612

Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ Steel ☐ Other
Monitoring Point Description (Notch, N, etc): NORTH

PURGE VOLUME
Casing Diameter, D (in inches): 2"
Total Depth of Casing TD (in feet): 19.93'
Depth to Oil below TOC: NA
Depth to Water below TOC, WL (in feet): 13.15
Pump Intake (in feet): 16

PURGE METHOD
☐ Bailor-Type
☐ Submersible Pump ☐ Turbine ☐ Bladder ☐ Other
☒ Other-Specific: PERISTALTIC
Volume of Oil Removed: NA gallons

PURGE TIME
Start Time: 1633 Stop Time: 1800 Elapsed Time: _____
Pump Settings (Cycles): 150 ml/m

PURGE RATE
Initial: 150 ml/m Final: 200 ml/m

ACTUAL PURGE VOLUME
4.8 gallons

FIELD PARAMETERS

Time (24Hr)	Discharge Rate (ml/m)	Volume Purged	DO	pH (pH unit)	ORP (mV)	Temperature (°F or °C)	Spec. Cond. (mS/cm)	Turbidity (NTU)	Notes
1633	150	0	11.0	6.93	35.1	15.5	0.01	NR	SUPER TURBID
1634	150	450	10.0	6.85	63.8	16.11	0.272	NR	"
1636	150	900	50.2	6.65	72.1	16.24	0.274	20.0	"
1639	150	1350	40.8	6.61	80.1	16.32	0.275	20.0	"
1642	150	1800	48.3	6.61	82.3	16.31	0.274	20.0	"
1645	150	2250	49.9	6.63	84.7	16.35	0.274	20.0	"
1647	150	2700	46.4	6.61	90.1	16.33	0.270	20.0	CLEARING UP
1651	200	4800	73.0	6.71	96.1	15.80	0.250	17.5	"
1705	200	5400	35.1	6.57	103.8	15.90	0.251	17.0	"
1708	200	6000	32.1	6.53	105.7	15.93	0.250	18.5	"
1711	200	6600	30.7	6.51	109.6	15.98	0.250	20.1	"
1714	200	7200	30.1	6.50	109.1	15.73	0.251	20.4	"
1717	200	7800	29.6	6.49	110.2	15.74	0.250	20.5	"
1720	200	8400	28.3	6.47	111.0	15.75	0.251	21.1	"
1723	200	9000	28.0	6.48	110.9	15.72	0.251	21.1	"
1726	200	9600	27.9	6.47	110.7	15.72	0.251	21.1	"
1729	200	9600	27.9	6.47	110.7	15.72	0.251	21.1	"

Stabilization Criteria

± 10%

± 0.1

± 10 mV

± 1°

± 3%

± 10%

Field Equipment

Pump Info (Make / Model Serial #):

SAME

WQ Meter 1 Info (Make / Model Serial #):

WQ Meter 2 Info (Make / Model Serial #):

Turbidity Meter Info (Make / Model Serial #):

Water Level Meter Info (Make / Model Serial #):

Equipment Provider:

Pine Environmental Services, Inc.

Condition of water during purging (turbidity, color, odor):

SUPER TURBID, CHOC. MILK-LIKE, BROWN

Other Notes:

Condition of well:

Purge Water Disposal:

Post Purging Depth to Water below TOC, FWL (in feet):

13.84'

WELL SAMPLING METHOD

☒ Same as for Purging

* 1735 MW-01

* 1742 Dup 11.16.18

Duplicate's MS/MSD
Collected Also
* 1753 MS
* 1800 MSD

Other - describe:

NR - No reading
Over range
detectable

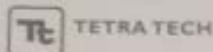
Page:

1

of

1

→ Exh 2 500 ml Amber
Sample 1 500 ml Amber Hcl



Project Name: CIL CONCRETE
Project Number: 103P3080257.01
Laboratory: ALS ENV

LOW FLOW GROUNDWATER SAMPLING FORM

Well No: MW-03
Sampled by: SD
Date: 11-16-10 Time: 1315

Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ Steel ☐ Other
Monitoring Point Description (Notch, N, etc): NORTH

PURGE VOLUME

Casing Diameter, D (in inches): 2"
Total Depth of Casing TD (in feet): 19.93'
Depth to Oil below TOC: NA
Depth to Water below TOC, WL (in feet): 12.62'
Pump Intake (in feet): 17'

PURGE METHOD

☐ Bail-Type
☐ Submersible Pump ☐ Turbine ☐ Bladder ☐ Other
☒ Other-Specify: PERISTALTIC
Volume of Oil Removed: NA gallons

PURGE TIME

Start Time: 1520 Stop Time: 1410 Elapsed Time: 50
Pump Settings (Cycles): 150 ml/min

PURGE RATE

Initial: 150 ml/min Final: 150 ml/min

ACTUAL PURGE VOLUME

2.1 gallons

FIELD PARAMETERS

Time (24Hr)	Discharge Rate (ml/min)	Volume Purged (ml)	DO (mg/L)	pH (pH unit)	ORP (mV)	Temperature (°F or °C)	Spec. Cond. (mS/cm)	Turbidity (NTU)	Notes
1520	150	0	55.7	6.66	59.0	16.06	0.171	12.80	TURBID
1323	150	450	52.0	6.66	47.6	16.10	0.170	13.91	"
1326	150	900	49.8	6.64	40.1	16.12	0.171	13.8	"
1329	150	1350	42.9	6.62	29.1	16.10	0.170	13.70	"
1332	150	1800	41.0	6.63	24.3	16.08	0.172	13.70	"
1335	150	2250	38.8	6.61	21.8	16.04	0.172	11.61	CLEANING UP
1338	150	2700	36.8	6.61	21.4	16.05	0.172	10.73	"
1341	150	3150	35.1	6.63	21.5	16.06	0.172	9.85	LEAR
1344	150	3600	34.5	6.61	19.8	16.05	0.171	9.02	"
1347	150	4050	33.1	6.61	13.4	16.04	0.172	8.48	"
1350	150	4500	32.0	6.60	17.5	16.04	0.171	8.41	"
1353	150	4950	31.5	6.61	9.7	16.04	0.172	7.93	"
Stabilization Criteria			± 10%	± 0.1	± 10 mV	± 1°	± 3%	± 10%	

Field Equipment

Pump Info (Make / Model Serial #): SAME
WQ Meter 1 Info (Make / Model Serial #):
WQ Meter 2 Info (Make / Model Serial #):
Turbidity Meter Info (Make / Model Serial #):
Water Level Meter Info (Make / Model Serial #):
Equipment Provider: Pine Environmental Services, Inc.

Condition of water during purging (turbidity, color, odor):

Other Notes:

Condition of well:

Purge Water Disposal:

Post Purging Depth to Water below TOC, FWL (in feet): 12.71'

TURBID w/ BROWN & GREEN SEDIMENT
RAINING STOPPED AROUND 1325
NO WATER IN MONUMENT. BALL OF BLACK POY SHEETING IN MONUMENT
DRUM

WELL SAMPLING METHOD

☒ Same as for Purging

☐ Other - describe

Page: 1 of 1

*1410 2 500ml Amber
1 500ml Amber HCl



Project Name: CTL LONGVIEN
Project Number: 103P3080237-01
Laboratory: ALS ENV

LOW FLOW GROUNDWATER SAMPLING FORM

Well No: MW-04
Sampled by: SD
Date: 11.16.12 Time: 1025

Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ Steel ☐ Other
Monitoring Point Description (Notch, N, etc): NORTH

PURGE VOLUME

Casing Diameter, D (in inches) 14.13'
 Total Depth of Casing TD (in feet) NA
 Depth to Oil below TOC 12.97'
 Depth to Water below TOC, WT (in feet) 16'
 Pump Intake (in feet) 16'

PURGE METHOD

☐ Bailer-Type: _____
☐ Submersible Pump ☐ Turbine ☐ Bladder ☐ Other: _____
☒ Other-Specify: **PERISTALTIC**
 Volume of Oil Removed: **NA** gallons

PURGE TIME

PURGE TIME
Start Time 1045 Stop Time 1119 Elapsed Time 34
Pump Settings (Cycles): 150 ml/m

PURGE RATE

PURGE RATE Initial 150 ml/m Final 150 ml/m

ACTUAL PURGE VOLUME

✓ 1.9 gallons

FIELD PARAMETERS

[illegible]

Field Equipment

Pump Info (Make / Model Serial #):	SAME
WQ Meter 1 Info (Make / Model Serial #):	↓
WQ Meter 2 Info (Make / Model Serial #):	
Turbidity Meter Info (Make / Model Serial #):	
Water Level Meter Info (Make / Model Serial #):	
Equipment Provider:	Pine Environmental Services, Inc.

Condition of water during purging (turbidity, color, odor):

Other Notes:

Condition of well:

Purge Water Disposal

Post Purging Depth to Water below TOC, FWL (in feet)

CLEAR, SLIGHT ODOR

RAINING

WATER IN MONUMENT W/ SHEEN, LOTS OF SEDIMENT

PPM

12.84'

RAINING DURING PULPING/SAMPLING

WELL SAMPLING METHOD

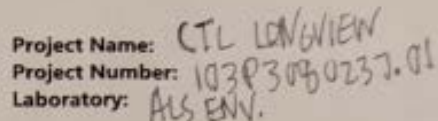
Same as for Purging

☐ Other – describe _____

Page: 1 of 1

Same as for Purging

1125	2	500ml Amber
	1	500ml Amber HCl



Well No: MW-05
Sampled by: SD
Date: 11-16-18 Time: 0850

Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ Steel ☐ Other
Monitoring Point Description (Notch, N, etc): NORTH

Casing Diameter, D (In Inches) 2"
Total Depth of Casing TD (In feet) 19.63'
Depth to Oil below TOC NA
Depth to Water below TOC, WL (In feet) 12.49'
Pump Intake (In feet) 15'

☐ Bailer-Type: _____
☐ Submersible Pump ☐ Turbine ☐ Bladder ☐ Other _____
☒ Other-Specify: PERISTALTIC
 Volume of Oil Removed: NA gallons

Start Time 0900 Stop Time 0932 Elapsec Time 32
Pump Settings (Cycles): 150 m/m

Initial 150 ml/m Final 150 ml/m

ACTUAL FUEL VOLUME
= 1.75 gallons

[illegible]

Field Equipment	
Pump Info (Make / Model Serial #):	PINE ENV. SVC. / 031274
WQ Meter 1 Info (Make / Model Serial #):	YSI 650 w/ FLOW THROUGH CELL / 032169
WQ Meter 2 Info (Make / Model Serial #):	YSI 600 XLM / 7319
Turbidity Meter Info (Make / Model Serial #):	HACH 2100Q / 16631
Water Level Meter Info (Make / Model Serial #):	HERON INSTRUMENTS, DIPPER-T 200' / 27120
Equipment Provider:	Pine Environmental Services, Inc.

Condition of water during purging (turbidity, color, odor): clear, slight odor

Other Notes:

Condition of well:

Purge Water Disposal:

Post Purging Depth to Water below TOC, FWL (In feet) 12.52'

☒ Same as for Purging

☐ Other – describe _____

* 0940 2 500ml Amber
1 500ml Amber HCl

Page: of

ATTACHMENT B
LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY RECORDS



December 17, 2018

Service Request No:K1811274

David Berestka
Tetra Tech EM, Incorporated
216 16th St , Suite 1500
Denver, CO 80202

Laboratory Results for: CTL Longview WA

Dear David,

Enclosed are the results of the sample(s) submitted to our laboratory November 16, 2018
For your reference, these analyses have been assigned our service request number **K1811274**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3275. You may also contact me via email at Chris.Leaf@ALSGlobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Chris Leaf
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA
Sample Matrix: Water

Service Request: K1811274
Date Received: 11/16/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt:

Eight water samples were received for analysis at ALS Environmental on 11/16/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Semivolatiles by GC/MS:

Method 8270D, Polynuclear Aromatic Hydrocarbons: The recovery of Carbazole in Laboratory Control Sample KWG1806098-1/2 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. No further corrective action was taken.

Method 8270D, Polynuclear Aromatic Hydrocarbons: The following analytes were flagged as outside the control criterion for the Continuing Calibration Verification (CCV): Pyrene. In accordance with the EPA Method, 80% or more of the CCV analytes must have passed within 20% of the true value. The remaining analytes are allowed a 40% difference as per the ALS SOP. The CCV met these criteria. No further corrective action was required.

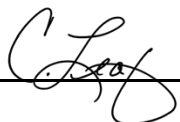
Method 8270D, Polynuclear Aromatic Hydrocarbons: The results reported for the following compounds in samples MW-04 and MW-05 may contain a slight bias: Acenaphthylene, Fluorene. The chromatogram indicated the presence of non-target background components. The matrix interference may have resulted in a slight high bias in the affected samples. The results were flagged with "X" to indicate the issue.

Semivolatile GC:

Method NWTPH-Dx, Diesel and Residual Range Organics: The upper control criterion was exceeded for Diesel Range Organics in Continuing Calibration Verification (CCV) KWG1806188-2. The field samples analyzed in this sequence did not contain the analyte in question above the MRL. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

Method NWTPH-Dx, Diesel and Residual Range Organics: Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Approved by



Date

12/17/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: DUP 11-16-18	Lab ID: K1811274-001
--------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Naphthalene	0.0053	J	0.0014	0.020	ug/L	8270D SIM
2-Methylnaphthalene	0.0035	J	0.0013	0.020	ug/L	8270D SIM
1-Methylnaphthalene	0.0022	J	0.0013	0.020	ug/L	8270D SIM
Dibenzofuran	0.0032	J	0.00096	0.020	ug/L	8270D SIM
Fluorene	0.0041	J	0.0011	0.020	ug/L	8270D SIM
Phenanthrene	0.0045	J	0.0011	0.020	ug/L	8270D SIM
Fluoranthene	0.0080	J	0.00082	0.020	ug/L	8270D SIM
Pyrene	0.074		0.0010	0.020	ug/L	8270D SIM
Benz(a)anthracene	0.0026	J	0.00097	0.020	ug/L	8270D SIM
Diesel Range Organics (DRO)	93	J	13	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	140	J	22	560	ug/L	NWTPH-Dx

CLIENT ID: MW-05	Lab ID: K1811274-002
-------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Naphthalene	0.0088	J	0.0014	0.020	ug/L	8270D SIM
2-Methylnaphthalene	0.0058	J	0.0013	0.020	ug/L	8270D SIM
1-Methylnaphthalene	0.0036	J	0.0013	0.020	ug/L	8270D SIM
Acenaphthylene	0.0081	JX	0.0011	0.020	ug/L	8270D SIM
Acenaphthene	0.0038	J	0.0012	0.020	ug/L	8270D SIM
Dibenzofuran	0.0035	J	0.00096	0.020	ug/L	8270D SIM
Fluorene	0.013	JX	0.0011	0.020	ug/L	8270D SIM
Phenanthrene	0.0068	J	0.0011	0.020	ug/L	8270D SIM
Anthracene	0.0047	J	0.00082	0.020	ug/L	8270D SIM
Fluoranthene	0.0037	J	0.00082	0.020	ug/L	8270D SIM
Pyrene	0.0040	J	0.0010	0.020	ug/L	8270D SIM
Benz(a)anthracene	0.0019	J	0.00097	0.020	ug/L	8270D SIM
Diesel Range Organics (DRO)	77	J	13	290	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	380	J	22	580	ug/L	NWTPH-Dx

CLIENT ID: MW-04	Lab ID: K1811274-003
-------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Naphthalene	0.041		0.0014	0.020	ug/L	8270D SIM
2-Methylnaphthalene	0.0058	J	0.0013	0.020	ug/L	8270D SIM
1-Methylnaphthalene	0.015	J	0.0013	0.020	ug/L	8270D SIM
Acenaphthylene	0.017	JX	0.0011	0.020	ug/L	8270D SIM
Acenaphthene	0.58		0.0012	0.020	ug/L	8270D SIM
Dibenzofuran	0.0070	J	0.00096	0.020	ug/L	8270D SIM
Fluorene	0.039	X	0.0011	0.020	ug/L	8270D SIM
Phenanthrene	0.0072	J	0.0011	0.020	ug/L	8270D SIM
Anthracene	0.019	J	0.00082	0.020	ug/L	8270D SIM
Carbazole	0.029		0.0011	0.020	ug/L	8270D SIM
Fluoranthene	0.0020	J	0.00082	0.020	ug/L	8270D SIM

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-04	Lab ID: K1811274-003
-------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Pyrene	0.030		0.0010	0.020	ug/L	8270D SIM
Benz(a)anthracene	0.0023	J	0.00097	0.020	ug/L	8270D SIM
Diesel Range Organics (DRO)	60	J	14	300	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	110	J	23	600	ug/L	NWTPH-Dx

CLIENT ID: MW-03	Lab ID: K1811274-004
-------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Naphthalene	0.015	J	0.0014	0.020	ug/L	8270D SIM
2-Methylnaphthalene	0.0042	J	0.0013	0.020	ug/L	8270D SIM
1-Methylnaphthalene	0.0029	J	0.0013	0.020	ug/L	8270D SIM
Acenaphthene	0.0049	J	0.0012	0.020	ug/L	8270D SIM
Dibenzofuran	0.0035	J	0.00096	0.020	ug/L	8270D SIM
Fluorene	0.0031	J	0.0011	0.020	ug/L	8270D SIM
Phenanthrene	0.0055	J	0.0011	0.020	ug/L	8270D SIM
Fluoranthene	0.0014	J	0.00082	0.020	ug/L	8270D SIM
Pyrene	0.0016	J	0.0010	0.020	ug/L	8270D SIM
Benz(a)anthracene	0.0020	J	0.00097	0.020	ug/L	8270D SIM
Diesel Range Organics (DRO)	61	J	13	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	240	J	22	560	ug/L	NWTPH-Dx

CLIENT ID: MW-01	Lab ID: K1811274-005
-------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Naphthalene	0.0081	J	0.0014	0.020	ug/L	8270D SIM
2-Methylnaphthalene	0.0055	J	0.0013	0.020	ug/L	8270D SIM
1-Methylnaphthalene	0.0035	J	0.0013	0.020	ug/L	8270D SIM
Acenaphthene	0.0030	J	0.0012	0.020	ug/L	8270D SIM
Dibenzofuran	0.0036	J	0.00096	0.020	ug/L	8270D SIM
Fluorene	0.0033	J	0.0011	0.020	ug/L	8270D SIM
Phenanthrene	0.0065	J	0.0011	0.020	ug/L	8270D SIM
Fluoranthene	0.0014	J	0.00082	0.020	ug/L	8270D SIM
Pyrene	0.0017	J	0.0010	0.020	ug/L	8270D SIM
Benz(a)anthracene	0.0020	J	0.00097	0.020	ug/L	8270D SIM
Diesel Range Organics (DRO)	48	J	13	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	130	J	22	560	ug/L	NWTPH-Dx

CLIENT ID: MW-02	Lab ID: K1811274-006
-------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Naphthalene	0.0057	J	0.0014	0.020	ug/L	8270D SIM
2-Methylnaphthalene	0.0031	J	0.0013	0.020	ug/L	8270D SIM
1-Methylnaphthalene	0.0025	J	0.0013	0.020	ug/L	8270D SIM
Dibenzofuran	0.0033	J	0.00096	0.020	ug/L	8270D SIM
Fluorene	0.0044	J	0.0011	0.020	ug/L	8270D SIM
Phenanthrene	0.0049	J	0.0011	0.020	ug/L	8270D SIM

SAMPLE DETECTION SUMMARY**CLIENT ID: MW-02****Lab ID: K1811274-006**

Analyte	Results	Flag	MDL	MRL	Units	Method
Fluoranthene	0.0077	J	0.00082	0.020	ug/L	8270D SIM
Pyrene	0.064		0.0010	0.020	ug/L	8270D SIM
Benz(a)anthracene	0.0021	J	0.00097	0.020	ug/L	8270D SIM
Diesel Range Organics (DRO)	96	J	12	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	140	J	21	550	ug/L	NWTPH-Dx



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01

Service Request:K1811274

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K1811274-001	DUP 11-16-18	11/16/2018	
K1811274-002	MW-05	11/16/2018	0940
K1811274-003	MW-04	11/16/2018	1125
K1811274-004	MW-03	11/16/2018	1410
K1811274-005	MW-01	11/16/2018	1545
K1811274-006	MW-02	11/16/2018	1735
K1811274-007	MS	11/16/2018	1753
K1811274-008	MSD	11/16/2018	1800



94278

CHAIN OF CUSTODY

94278

001

1317 South 13th Ave, Kelso, WA 98626 Phone (360) 577-7222 / 800-695-7222 / FAX (360) 636-1068

www.alsglobal.com

SR# 181274

COC Set 1 of 1

COC#

Page 1 of 1

Project Name CTL LONGVIEW WA		Project Number 103P3080237.01		7D 14D		NUMBER OF CONTAINERS 32700 / PAH S Filter SVM / Filter SVM NWTPH-Dx / NW_TPH						1 2 3 4 5 6						Remarks	
Project Manager DAVE BERESTKA																			
Company TETRA TECH																			
Address 216 16TH STREET, DENVER, CO 80202																			
Phone # 303-302-8856		DAVID BERESTKA																	
Sampler Signature [Signature]		Sampler Printed Name SCOTT M DUZAN																	
CLIENT SAMPLE ID		LABID		SAMPLING Date Time		Matrix													
1. DVP 11.16.18				11.16.18 —		GW		3		X		X		X					
2. MW-05				0940		 		 		 		 							
3. MW-04				1125		 		 		 		 							
4. MW-03				1410		 		 		 		 							
5. MW-01				1545		 		 		 		 							
6. MW-02				1735		 		 		 		 							
7. MS				1753		 		 		 		 							
8. MSD				1800		 		 		 		 							
9.																			
10.																			

Report Requirements <input type="checkbox"/> I. Routine Report: Method Blank, Surrogate, as required <input type="checkbox"/> II. Report Dup., MS, MSD as required <input type="checkbox"/> III. CLP Like Summary (no raw data) <input type="checkbox"/> IV. Data Validation Report <input type="checkbox"/> V. EDD VERIFY w/ PM		Invoice Information P.O.# 1159337 Bill To: PM		Circle which metals are to be analyzed Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Ti Sn V Zn Hg			
		Turnaround Requirements 24 hr. 48 hr. <input checked="" type="checkbox"/> 5 Day Standard					
		Relinquished By:		Received By:		Special Instructions/Comments: *Indicate State Hydrocarbon Procedure: AK CA WI Northwest Other (Circle One)	
		Signature [Signature]		Signature [Signature]			
Printed Name SCOTT M DUZAN		Printed Name Jeffrey M. Smith					
Firm TETRA TECH		Firm ALS Environmental					
Date/Time 1/4/2		Date/Time 11/16/18					

PC CL

Cooler Receipt and Preservation Form

Client TETRA TECH Service Request K18 11274
Received: 11-16-18 Opened: 11-17-18 By: JSP Unloaded: 11-17-18 By: JSP

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
<u>0.0</u>	<u>0.1</u>	<u>NA</u>	<u>NA</u>	<u>+0.1</u>	<u>393</u>	<u>94278</u>		<u>NA</u>	
<u>2.4</u>	<u>2.6</u>	<u>0.5</u>	<u>0.7</u>	<u>+0.2</u>	<u>323</u>				

4. Packing material Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? NA Y N
If applicable, tissue samples were received: Frozen Partially Thawed Thawed
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? NA Y N
11. Were VOA vials received without headspace? NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18
Date Received: 11/16/18 19:42

Sample Name: DUP 11-16-18
Lab Code: K1811274-001

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.0053 J	0.020	0.0014	1	11/28/18 17:06	11/21/18	
2-Methylnaphthalene	0.0035 J	0.020	0.0013	1	11/28/18 17:06	11/21/18	
1-Methylnaphthalene	0.0022 J	0.020	0.0013	1	11/28/18 17:06	11/21/18	
Acenaphthylene	ND U	0.020	0.0011	1	11/28/18 17:06	11/21/18	
Acenaphthene	ND U	0.020	0.0012	1	11/28/18 17:06	11/21/18	
Dibenzofuran	0.0032 J	0.020	0.00096	1	11/28/18 17:06	11/21/18	
Fluorene	0.0041 J	0.020	0.0011	1	11/28/18 17:06	11/21/18	
Phenanthrene	0.0045 J	0.020	0.0011	1	11/28/18 17:06	11/21/18	
Anthracene	ND U	0.020	0.00082	1	11/28/18 17:06	11/21/18	
Carbazole	ND U	0.020	0.0011	1	11/28/18 17:06	11/21/18	*
Fluoranthene	0.0080 J	0.020	0.00082	1	11/28/18 17:06	11/21/18	
Pyrene	0.074	0.020	0.0010	1	11/28/18 17:06	11/21/18	
Benz(a)anthracene	0.0026 J	0.020	0.00097	1	11/28/18 17:06	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 17:06	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 17:06	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 17:06	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 17:06	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 17:06	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 17:06	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 17:06	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	97	42 - 131	11/28/18 17:06	
Fluoranthene-d10	92	42 - 133	11/28/18 17:06	
p-Terphenyl-d14	90	32 - 129	11/28/18 17:06	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 09:40
Date Received: 11/16/18 19:42

Sample Name: MW-05
Lab Code: K1811274-002

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.0088 J	0.020	0.0014	1	11/28/18 17:32	11/21/18	
2-Methylnaphthalene	0.0058 J	0.020	0.0013	1	11/28/18 17:32	11/21/18	
1-Methylnaphthalene	0.0036 J	0.020	0.0013	1	11/28/18 17:32	11/21/18	
Acenaphthylene	0.0081 JX	0.020	0.0011	1	11/28/18 17:32	11/21/18	
Acenaphthene	0.0038 J	0.020	0.0012	1	11/28/18 17:32	11/21/18	
Dibenzofuran	0.0035 J	0.020	0.00096	1	11/28/18 17:32	11/21/18	
Fluorene	0.013 JX	0.020	0.0011	1	11/28/18 17:32	11/21/18	
Phenanthrene	0.0068 J	0.020	0.0011	1	11/28/18 17:32	11/21/18	
Anthracene	0.0047 J	0.020	0.00082	1	11/28/18 17:32	11/21/18	
Carbazole	ND U	0.020	0.0011	1	11/28/18 17:32	11/21/18	*
Fluoranthene	0.0037 J	0.020	0.00082	1	11/28/18 17:32	11/21/18	
Pyrene	0.0040 J	0.020	0.0010	1	11/28/18 17:32	11/21/18	
Benz(a)anthracene	0.0019 J	0.020	0.00097	1	11/28/18 17:32	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 17:32	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 17:32	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 17:32	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 17:32	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 17:32	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 17:32	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 17:32	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	102	42 - 131	11/28/18 17:32	
Fluoranthene-d10	99	42 - 133	11/28/18 17:32	
p-Terphenyl-d14	99	32 - 129	11/28/18 17:32	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 11:25
Date Received: 11/16/18 19:42

Sample Name: MW-04
Lab Code: K1811274-003

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.041	0.020	0.0014	1	11/28/18 17:57	11/21/18	
2-Methylnaphthalene	0.0058 J	0.020	0.0013	1	11/28/18 17:57	11/21/18	
1-Methylnaphthalene	0.015 J	0.020	0.0013	1	11/28/18 17:57	11/21/18	
Acenaphthylene	0.017 JX	0.020	0.0011	1	11/28/18 17:57	11/21/18	
Acenaphthene	0.58	0.020	0.0012	1	11/28/18 17:57	11/21/18	
Dibenzofuran	0.0070 J	0.020	0.00096	1	11/28/18 17:57	11/21/18	
Fluorene	0.039 X	0.020	0.0011	1	11/28/18 17:57	11/21/18	
Phenanthrene	0.0072 J	0.020	0.0011	1	11/28/18 17:57	11/21/18	
Anthracene	0.019 J	0.020	0.00082	1	11/28/18 17:57	11/21/18	
Carbazole	0.029	0.020	0.0011	1	11/28/18 17:57	11/21/18	*
Fluoranthene	0.0020 J	0.020	0.00082	1	11/28/18 17:57	11/21/18	
Pyrene	0.030	0.020	0.0010	1	11/28/18 17:57	11/21/18	
Benz(a)anthracene	0.0023 J	0.020	0.00097	1	11/28/18 17:57	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 17:57	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 17:57	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 17:57	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 17:57	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 17:57	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 17:57	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 17:57	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	99	42 - 131	11/28/18 17:57	
Fluoranthene-d10	93	42 - 133	11/28/18 17:57	
p-Terphenyl-d14	88	32 - 129	11/28/18 17:57	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 14:10
Date Received: 11/16/18 19:42

Sample Name: MW-03
Lab Code: K1811274-004

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.015 J	0.020	0.0014	1	11/28/18 18:23	11/21/18	
2-Methylnaphthalene	0.0042 J	0.020	0.0013	1	11/28/18 18:23	11/21/18	
1-Methylnaphthalene	0.0029 J	0.020	0.0013	1	11/28/18 18:23	11/21/18	
Acenaphthylene	ND U	0.020	0.0011	1	11/28/18 18:23	11/21/18	
Acenaphthene	0.0049 J	0.020	0.0012	1	11/28/18 18:23	11/21/18	
Dibenzofuran	0.0035 J	0.020	0.00096	1	11/28/18 18:23	11/21/18	
Fluorene	0.0031 J	0.020	0.0011	1	11/28/18 18:23	11/21/18	
Phenanthrene	0.0055 J	0.020	0.0011	1	11/28/18 18:23	11/21/18	
Anthracene	ND U	0.020	0.00082	1	11/28/18 18:23	11/21/18	
Carbazole	ND U	0.020	0.0011	1	11/28/18 18:23	11/21/18	*
Fluoranthene	0.0014 J	0.020	0.00082	1	11/28/18 18:23	11/21/18	
Pyrene	0.0016 J	0.020	0.0010	1	11/28/18 18:23	11/21/18	
Benz(a)anthracene	0.0020 J	0.020	0.00097	1	11/28/18 18:23	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 18:23	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 18:23	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 18:23	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 18:23	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 18:23	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 18:23	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 18:23	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	103	42 - 131	11/28/18 18:23	
Fluoranthene-d10	98	42 - 133	11/28/18 18:23	
p-Terphenyl-d14	95	32 - 129	11/28/18 18:23	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 15:45
Date Received: 11/16/18 19:42

Sample Name: MW-01
Lab Code: K1811274-005

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.0081 J	0.020	0.0014	1	11/28/18 18:48	11/21/18	
2-Methylnaphthalene	0.0055 J	0.020	0.0013	1	11/28/18 18:48	11/21/18	
1-Methylnaphthalene	0.0035 J	0.020	0.0013	1	11/28/18 18:48	11/21/18	
Acenaphthylene	ND U	0.020	0.0011	1	11/28/18 18:48	11/21/18	
Acenaphthene	0.0030 J	0.020	0.0012	1	11/28/18 18:48	11/21/18	
Dibenzofuran	0.0036 J	0.020	0.00096	1	11/28/18 18:48	11/21/18	
Fluorene	0.0033 J	0.020	0.0011	1	11/28/18 18:48	11/21/18	
Phenanthrene	0.0065 J	0.020	0.0011	1	11/28/18 18:48	11/21/18	
Anthracene	ND U	0.020	0.00082	1	11/28/18 18:48	11/21/18	
Carbazole	ND U	0.020	0.0011	1	11/28/18 18:48	11/21/18	*
Fluoranthene	0.0014 J	0.020	0.00082	1	11/28/18 18:48	11/21/18	
Pyrene	0.0017 J	0.020	0.0010	1	11/28/18 18:48	11/21/18	
Benz(a)anthracene	0.0020 J	0.020	0.00097	1	11/28/18 18:48	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 18:48	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 18:48	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 18:48	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 18:48	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 18:48	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 18:48	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 18:48	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	100	42 - 131	11/28/18 18:48	
Fluoranthene-d10	97	42 - 133	11/28/18 18:48	
p-Terphenyl-d14	78	32 - 129	11/28/18 18:48	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 17:35
Date Received: 11/16/18 19:42

Sample Name: MW-02
Lab Code: K1811274-006

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.0057 J	0.020	0.0014	1	11/28/18 19:15	11/21/18	
2-Methylnaphthalene	0.0031 J	0.020	0.0013	1	11/28/18 19:15	11/21/18	
1-Methylnaphthalene	0.0025 J	0.020	0.0013	1	11/28/18 19:15	11/21/18	
Acenaphthylene	ND U	0.020	0.0011	1	11/28/18 19:15	11/21/18	
Acenaphthene	ND U	0.020	0.0012	1	11/28/18 19:15	11/21/18	
Dibenzofuran	0.0033 J	0.020	0.00096	1	11/28/18 19:15	11/21/18	
Fluorene	0.0044 J	0.020	0.0011	1	11/28/18 19:15	11/21/18	
Phenanthrene	0.0049 J	0.020	0.0011	1	11/28/18 19:15	11/21/18	
Anthracene	ND U	0.020	0.00082	1	11/28/18 19:15	11/21/18	
Carbazole	ND U	0.020	0.0011	1	11/28/18 19:15	11/21/18	*
Fluoranthene	0.0077 J	0.020	0.00082	1	11/28/18 19:15	11/21/18	
Pyrene	0.064	0.020	0.0010	1	11/28/18 19:15	11/21/18	
Benz(a)anthracene	0.0021 J	0.020	0.00097	1	11/28/18 19:15	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 19:15	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 19:15	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 19:15	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 19:15	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 19:15	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 19:15	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 19:15	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	97	42 - 131	11/28/18 19:15	
Fluoranthene-d10	92	42 - 133	11/28/18 19:15	
p-Terphenyl-d14	87	32 - 129	11/28/18 19:15	



Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18
Date Received: 11/16/18 19:42

Sample Name: DUP 11-16-18
Lab Code: K1811274-001

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	93 J	280	13	1	11/28/18 12:41	11/26/18	
Residual Range Organics (RRO)	140 J	560	22	1	11/28/18 12:41	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	95	50 - 150	11/28/18 12:41	
n-Triacontane	102	50 - 150	11/28/18 12:41	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 09:40
Date Received: 11/16/18 19:42

Sample Name: MW-05
Lab Code: K1811274-002

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	77 J	290	13	1	11/28/18 13:02	11/26/18	
Residual Range Organics (RRO)	380 J	580	22	1	11/28/18 13:02	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	92	50 - 150	11/28/18 13:02	
n-Triacontane	107	50 - 150	11/28/18 13:02	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 11:25
Date Received: 11/16/18 19:42

Sample Name: MW-04
Lab Code: K1811274-003

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	60 J	300	14	1	11/28/18 13:24	11/26/18	
Residual Range Organics (RRO)	110 J	600	23	1	11/28/18 13:24	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	92	50 - 150	11/28/18 13:24	
n-Triacontane	97	50 - 150	11/28/18 13:24	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 14:10
Date Received: 11/16/18 19:42

Sample Name: MW-03
Lab Code: K1811274-004

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	61 J	280	13	1	11/28/18 13:46	11/26/18	
Residual Range Organics (RRO)	240 J	560	22	1	11/28/18 13:46	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	93	50 - 150	11/28/18 13:46	
n-Triacontane	104	50 - 150	11/28/18 13:46	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 15:45
Date Received: 11/16/18 19:42

Sample Name: MW-01
Lab Code: K1811274-005

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	48 J	280	13	1	11/28/18 14:29	11/26/18	
Residual Range Organics (RRO)	130 J	560	22	1	11/28/18 14:29	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	93	50 - 150	11/28/18 14:29	
n-Triacontane	99	50 - 150	11/28/18 14:29	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: 11/16/18 17:35
Date Received: 11/16/18 19:42

Sample Name: MW-02
Lab Code: K1811274-006

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	96 J	280	12	1	11/28/18 14:08	11/26/18	
Residual Range Organics (RRO)	140 J	550	21	1	11/28/18 14:08	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	94	50 - 150	11/28/18 14:08	
n-Triacontane	100	50 - 150	11/28/18 14:08	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274

SURROGATE RECOVERY SUMMARY
Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Extraction Method: EPA 3511

Sample Name	Lab Code	Fluoranthene-d10	Fluorene-d10	p-Terphenyl-d14
		42 - 133	42 - 131	32 - 129
DUP 11-16-18	K1811274-001	92	97	90
MW-05	K1811274-002	99	102	99
MW-04	K1811274-003	93	99	88
MW-03	K1811274-004	98	103	95
MW-01	K1811274-005	97	100	78
MW-02	K1811274-006	92	97	87
Lab Control Sample	KWG1806098-1	104	102	94
Duplicate Lab Control Sample	KWG1806098-2	105	103	95
Method Blank	KWG1806098-3	102	102	103

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: KWG1806098-3

Units: ug/L
Basis: NA

Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Naphthalene	0.0046 J	0.020	0.0014	1	11/28/18 11:15	11/21/18	
2-Methylnaphthalene	0.0032 J	0.020	0.0013	1	11/28/18 11:15	11/21/18	
1-Methylnaphthalene	0.0021 J	0.020	0.0013	1	11/28/18 11:15	11/21/18	
Acenaphthylene	ND U	0.020	0.0011	1	11/28/18 11:15	11/21/18	
Acenaphthene	ND U	0.020	0.0012	1	11/28/18 11:15	11/21/18	
Dibenzofuran	0.0029 J	0.020	0.00096	1	11/28/18 11:15	11/21/18	
Fluorene	0.0020 J	0.020	0.0011	1	11/28/18 11:15	11/21/18	
Phenanthrene	0.0049 J	0.020	0.0011	1	11/28/18 11:15	11/21/18	
Anthracene	ND U	0.020	0.00082	1	11/28/18 11:15	11/21/18	
Carbazole	ND U	0.020	0.0011	1	11/28/18 11:15	11/21/18	*
Fluoranthene	ND U	0.020	0.00082	1	11/28/18 11:15	11/21/18	
Pyrene	0.0010 J	0.020	0.0010	1	11/28/18 11:15	11/21/18	
Benz(a)anthracene	0.0018 J	0.020	0.00097	1	11/28/18 11:15	11/21/18	
Chrysene	ND U	0.020	0.00076	1	11/28/18 11:15	11/21/18	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	11/28/18 11:15	11/21/18	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	11/28/18 11:15	11/21/18	
Benzo(a)pyrene	ND U	0.020	0.0011	1	11/28/18 11:15	11/21/18	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	11/28/18 11:15	11/21/18	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	11/28/18 11:15	11/21/18	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	11/28/18 11:15	11/21/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluorene-d10	102	42 - 131	11/28/18 11:15	
Fluoranthene-d10	102	42 - 133	11/28/18 11:15	
p-Terphenyl-d14	103	32 - 129	11/28/18 11:15	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Analyzed: 11/28/18
Date Extracted: 11/21/18

Duplicate Lab Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM
Prep Method: EPA 3511

Units: ug/L
Basis: NA
Analysis Lot: KWG1806383

Lab Control Sample
KWG1806098-1

Duplicate Lab Control Sample
KWG1806098-2

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
1-Methylnaphthalene	1.95	2.78	70	2.07	2.78	74	47-119	6	30
2-Methylnaphthalene	1.91	2.78	69	2.04	2.78	73	48-120	7	30
Acenaphthene	2.32	2.78	84	2.32	2.78	83	63-121	<1	30
Acenaphthylene	2.38	2.78	86	2.40	2.78	86	58-124	1	30
Anthracene	2.65	2.78	95	2.59	2.78	93	68-127	2	30
Benz(a)anthracene	2.67	2.78	96	2.60	2.78	93	74-124	3	30
Benzo(a)pyrene	2.83	2.78	102	2.77	2.78	100	75-131	2	30
Benzo(b)fluoranthene	2.77	2.78	100	2.72	2.78	98	73-136	2	30
Benzo(g,h,i)perylene	2.41	2.78	87	2.31	2.78	83	63-127	4	30
Benzo(k)fluoranthene	2.69	2.78	97	2.60	2.78	94	74-134	3	30
Carbazole	1.38	2.78	50 *	1.27	2.78	46 *	68-135	9	30
Chrysene	2.58	2.78	93	2.52	2.78	91	74-132	2	30
Dibenz(a,h)anthracene	2.72	2.78	98	2.67	2.78	96	59-135	2	30
Dibenzofuran	2.37	2.78	85	2.32	2.78	84	56-132	2	30
Fluoranthene	2.41	2.78	87	2.34	2.78	84	70-127	3	30
Fluorene	2.48	2.78	89	2.41	2.78	87	68-121	3	30
Indeno(1,2,3-cd)pyrene	2.72	2.78	98	2.67	2.78	96	63-136	2	30
Naphthalene	2.01	2.78	72	2.09	2.78	75	52-115	4	30
Phenanthrene	2.49	2.78	90	2.41	2.78	87	64-126	3	30
Pyrene	2.45	2.78	88	2.43	2.78	88	72-127	1	30



Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274

SURROGATE RECOVERY SUMMARY
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Extraction Method: EPA 3510C

Sample Name	Lab Code	n-Triacontane	o-Terphenyl
		50 - 150	50 - 150
DUP 11-16-18	K1811274-001	102	95
MW-05	K1811274-002	107	92
MW-04	K1811274-003	97	92
MW-03	K1811274-004	104	93
MW-01	K1811274-005	99	93
MW-02	K1811274-006	100	94
Lab Control Sample	KWG1806123-1	99	97
Duplicate Lab Control Sample	KWG1806123-2	101	99
Method Blank	KWG1806123-3	98	91

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: KWG1806123-3

Units: ug/L
Basis: NA

Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Diesel Range Organics (DRO)	17 J	250	11	1	11/28/18 11:14	11/26/18	
Residual Range Organics (RRO)	50 J	500	19	1	11/28/18 11:14	11/26/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	91	50 - 150	11/28/18 11:14	
n-Triacontane	98	50 - 150	11/28/18 11:14	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Tetra Tech EM, Incorporated
Project: CTL Longview WA/103P3080237.01
Sample Matrix: Water

Service Request: K1811274
Date Analyzed: 11/28/18
Date Extracted: 11/26/18

Duplicate Lab Control Sample Summary
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx
Prep Method: EPA 3510C

Units: ug/L
Basis: NA
Analysis Lot: KWG1806188

Lab Control Sample KWG1806123-1				Duplicate Lab Control Sample KWG1806123-2					
Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Diesel Range Organics (DRO)	3050	3200	95	2810	3200	88	46-140	8	30
Residual Range Organics (RRO)	1620	1600	101	1510	1600	95	45-159	7	30