TETRA TECH

June 3, 2020

Mr. Panjini Balaraju
Washington State Department of Ecology
Toxics Cleanup Program, Southwest Regional Office
P.O. Box 47775
Olympia, Washington 98504-7775

Sent via e-mail to PBAL461@ECY.WA.GOV

Subject: **Groundwater Monitoring Report, March 2020**
CenturyLink Longview Facility
1305 Washington Way, Longview, Washington 98632

Dear Mr. Balaraju:

Tetra Tech, Inc. on behalf of CenturyLink Communications, LLC (CenturyLink) is providing this summary of the groundwater sampling event conducted on March 19, 2020 at the CenturyLink Facility in Longview, Washington. 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 generally in accordance with the March 2015 Final Direct-Push Sampling Plan (Tetra Tech 2015) and approved by Washington State Department of 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 3.72 to 3.84 feet above mean sea level (amsl) and are summarized in the table below and shown on Figure 1. Groundwater levels were approximately 0.76 to 2.18 feet higher than observed in November 2018.

MARCH 19, 2020 GROUNDWATER ELEVATIONS

Location	Surveyed Top of Casing (ft amsl)	March 19, 2020 Depth to Water (ft)	March 19, 2020 Groundwater Elevation (ft amsl)
MW-01	15.64	11.85	3.79
MW-02	16.17	12.39	3.78
MW-03	15.02	11.18	3.84
MW-04	14.55	10.79	3.76
MW-05	14.75	11.03	3.72

Notes:
ft Feet
ft amsl Feet above mean sea level

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Based on groundwater elevation data shown on Figure 1, the direction of groundwater flow appears to be southwest, with a gradient of approximately 0.001. Historically, groundwater flow direction has typically ranged from west to northwest. Sitewide groundwater levels during this event are more uniform than typically observed and there is a flatter than normal gradient.

Groundwater Sample from Permanent Monitoring Wells

Groundwater samples were obtained from all five permanent monitoring wells at the facility. Per the groundwater monitoring plan, a field duplicate sample is collected during every other sampling event; because a field duplicate was collected during the November 2018 sampling event, no field duplicate was collected during this event. 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 kept at or below 220 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 prior to 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, temperature, 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 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 analytical reports in Attachment B.

ALS analyzed the samples for total petroleum hydrocarbons-diesel (TPH-DRO) and total petroleum hydrocarbons-residual range organics (TPH-RRO) by Northwest Total Petroleum Hydrocarbons-Diesel Extended Range Methodology (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 (SIM). The samples were filtered with a 0.7-micron (µm) filter before analysis by the PAH method.

Groundwater Sample Analytical Results

Table 1 presents groundwater analytical results for the samples collected during the March 19, 2020 event. The data were reviewed by a qualified chemist and met the quality control limits of the analytical methods. The method blanks had low-level detections of benz(a)anthracene, dibenzofuran, naphthalene, phenanthrene, TPH-DRO, and TPH-RRO. Based on method blank detections, the low-level detected results of the listed constituents were qualified as not detected at the reporting limit in the groundwater samples per the National Functional Guidelines for Organic Superfund Methods Data Review (EPA 2017). The method reporting limit for TPH-RRO (540 to 550 micrograms per liter [µg/L]) exceeds the Model Toxics Control Act Method A cleanup level for groundwater of 500 µg/L. However, the TPH-RRO concentrations in these samples are either attributable to laboratory contamination or are likely present in the groundwater samples at concentrations below the cleanup level. The maximum TPH-RRO result reported by the laboratory was 180 µg/L. The remainder of the results for the chemicals not listed above are usable as reported by the laboratory.

Low concentrations of PAHs were detected in all monitoring well samples; Table 1 also summarizes these results. There are no total PAH or compound-specific MTCA Method A cleanup levels for PAHs. The MTCA Method A cleanup level for the carcinogenic PAHs of 0.1 µg/L 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 multiplied by a toxicity equivalent factor (TEF). All the constituents that are part of the BaP TEQ calculation were not detected, thus the BaP TEQ results were also non-detect and below the MTCA Method A cleanup level.

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

Conclusions and Recommendations

For the March 2020 sampling event, analytical results for samples from all five monitoring well samples were below MTCA Method A cleanup levels for BaP TEQ and TPH-DRO. Because of method blank contamination, the TPH-RRO results are reported as not detected at the reporting limit. The reporting limit exceeds the MTCA Method A cleanup level for TPH-RRO. However, the TPH-RRO concentrations in these samples are either attributable to laboratory contamination or are likely present in the groundwater samples at concentrations below the cleanup levels.

The results from March 2020 were similar to previous spring and early 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. This monitoring schedule was discussed with Ecology's Mr. Steve Teel and Tetra Tech Engineer, Mr. Dave Berestka during a teleconference on March 22, 2017. Accordingly, the next groundwater monitoring events will be conducted in fall 2021 and spring 2023.

If you have any questions or concerns, please contact me at (303) 312-8813 or mark.reisig@tetratech.com.

Sincerely,

Mark Reisig
Program Manager
Tetra Tech, Inc.

cc: Joe Robertson, Regional Environmental Health and Safety Manager, CenturyLink
Dustin Mencel, Tetra Tech Project Manager

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

References

Tetra Tech. 2015. Direct-Push Groundwater Investigation and Sampling Plan: CenturyLink Longview facility, Longview, Washington. March 2.

United States Environmental Protection Agency (EPA). 2017. National Functional Guidelines for Organic Superfund Methods Data Review. (https://www.epa.gov/sites/production/files/2017-01/documents/national_functional_guidelines_for_organic_superfund_methods_data_review_013072017.pdf). Accessed on May 20, 2020.

Washington State Department of Ecology (Ecology). 1997. Analytical Methods For Petroleum Hydrocarbons. (https://fortress.wa.gov/ecy/publications/documents/97602.pdf). Accessed on May 20, 2020.

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 (µg/L)	0.1 (µg/L)
Location	**Date**				
MW-01	3/19/2020	<280	<550	0.0082	<0.020
MW-02	3/19/2020	<280	<550	0.078	<0.020
MW-03	3/19/2020	<280	<550	0.0107	<0.020
MW-04	3/19/2020	<270	<540	0.014	<0.020
MW-05	3/19/2020	<280	<550	0.0101	<0.020

Notes:

µg/L	Micrograms per liter
BaP TEQ	Benzo(a)Pyrene Toxic Equivalent Quotient
MTCA	Model Toxics Control Act Method A for groundwater
NA	Not applicable (no applicable MTCA standard)
ND	All PAHs included in the BaP TEQ calculation were not detected above laboratory detection limits
PAH	Polycyclic aromatic hydrocarbon
TPH-DRO	Total petroleum hydrocarbons diesel range organics
TPH-RRO	Total petroleum hydrocarbons residual range organics
<	Less than the method reporting limit shown

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
	3/19/2020	Low Flow	<280	<280	<280	<270	<280
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
	3/19/2020	Low Flow	**<550**	**<550**	**<550**	**<540**	**<550**

Notes:

1. All concentrations in micrograms per liter (µg/L)
2. **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

-- Not Sampled
< 0.01 Concentration is less than the method reporting limit shown

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

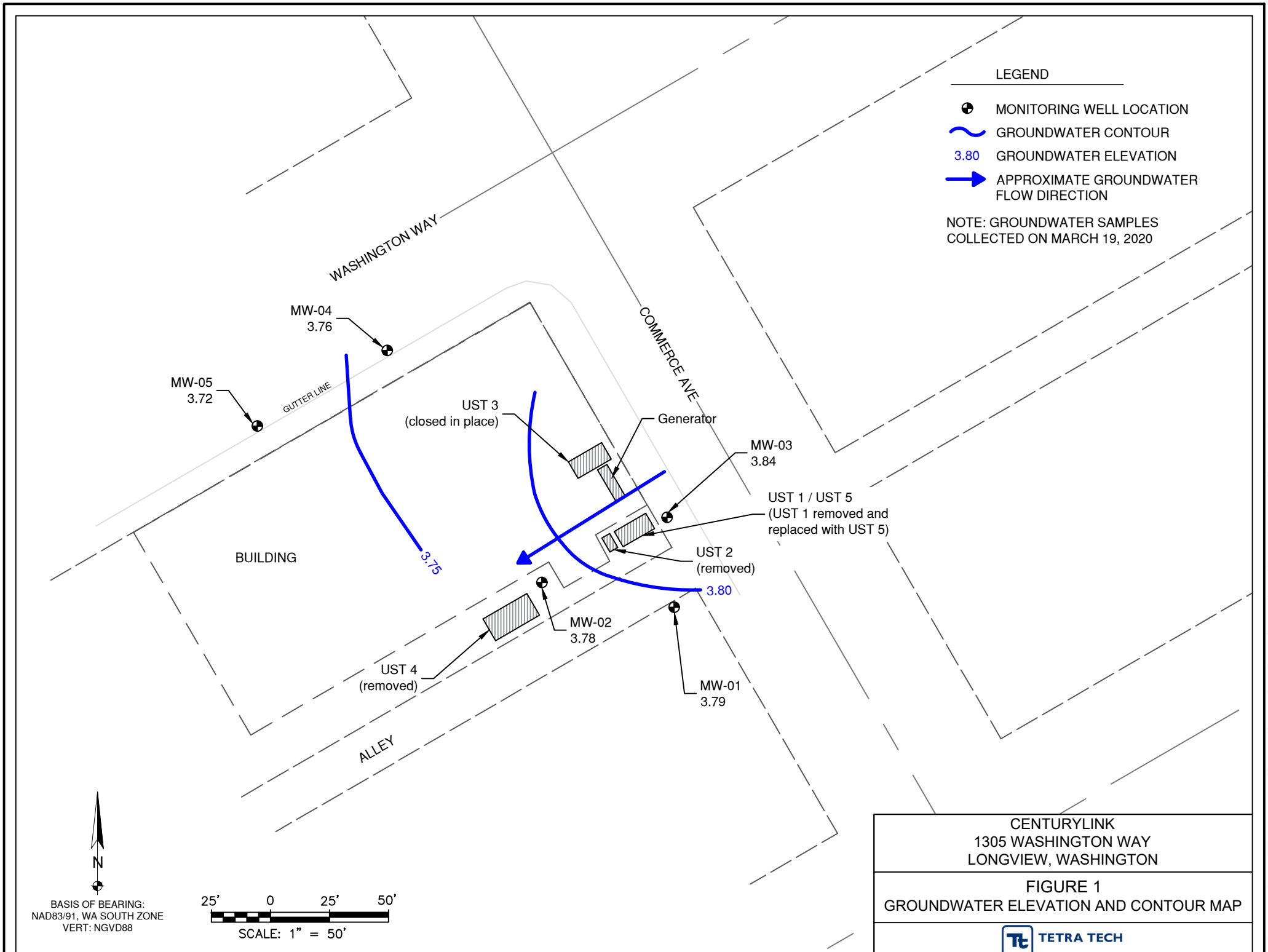
TABLE 3
HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS – BAP TEQ AND TOTAL PAH
CENTURYLINK LONGVIEW, WASHINGTON FACILITY

Analyte	Date	Sampling Method	MW-01	MW-02	MW-03	MW-04	MW-05
BaP TEQ	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
Unfiltered analysis	3/27/2014	Bailer	**0.37**	0.080	0.049	**0.27**	0.073
(MTCA Method A Cleanup Level = 0.1 µg/L)	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	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
Filtered analysis	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
(MTCA Method A Cleanup Level = 0.1 µg/L)	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
	3/19/2020	Low Flow	<0.020	<0.020	<0.020	<0.020	<0.020
Total PAH	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
Unfiltered analysis	3/27/2014	Bailer	3.5	1.3	0.50	3.1	0.80
(No MTCA Method A Cleanup Level)	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	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
Filtered analysis	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
(No MTCA Method A Cleanup Level)	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
	3/19/2020	Low Flow	0.0082	0.078	0.0107	0.014	0.0101

Notes:

µg/L Micrograms per liter
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 reporting limit shown

FIGURE



Source: Tetra Tech, Inc. field sketch, aerial photographs, and survey

C:\Users\dustin.mercer\Desktop\TEMP Project Folder\CenturyLink\Longview\2020 Sampling\Reporting\Figure\Figure 1 - Elevation and Contour Map Template.dwg

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

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Well Name:	MW-01	**Screen Interval:**	
Well Location:	South Side of Building	**Sample Depth:**	2.16 ft below TOC
Project:	CenturyLink - Longview	**Static Water Level:**	11.83 ft below TOC (with tubing)
Sample Date:	3/19/20	**Depth to LNAPL:**	NA
Sampling Personnel:	Danielle Gibson	**Total Depth of Casing:**	19.59'
Sample ID:	MW-01	**Begin Purge (Time):**	1013
Sample Time:	1117	**Casing Diameter (inches):**	4 in.
Duplicate ID:	NA	**Purge Method:**	Peristaltic
Field QC Designation:	NA	**Actual Final Purge Volume:**	9,290 mL
		Immiscible Layer Present:	No

Water Quality Information

Time	Discharge Rate (mL/min)	Dissolved Oxygen (~~mg/L~~ %)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (~~µmhos~~/cm) mS/cm	Turbidity ~~Turbity~~ (NTU)	Depth to Water (ft)
1024	175	34.6%	6.52	155.2	14.3	262.3	1.48	11.89
1027	175	33.6%	6.34	159.9	14.3	263.3	1.73	11.84
Paused purging. Water level not working.								
1039	180	30.9%	6.40	169.6	14.3	260.9	1.64	NR
1050	180	28.6%	6.35	178.0	14.1	260.5	1.80	11.87
1053	180	27.0%	6.44	179.6	14.1	258.9	1.39	11.88
1056	180	25.0%	6.42	180.7	14.2	259.0	1.44	11.87
1059	180	25.4%	6.41	181.8	14.0	259.1	~~1.75~~ 1.38	11.88
1102	180	23.6%	6.40	182.3	14.1	260.6	1.63	11.87
1105	180	24.4%	6.37	183.4	14.1	260.9	1.27	11.87
1108	180	24.8%	6.36	184.6	14.1	257.1	1.54	11.88
1111	180	23.4%	6.41	185.2	14.0	259.6	1.48	11.87
1114	180	21.6%	6.40	185.3	14.1	260.5	1.15	11.87
1117	180	22.7%	6.36	185.4	14.1	262.0	1.25	11.87

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Water Quality Information								
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbity (NTU)	Depth to Water (ft)
								DTW
Stabilization Criteria	3 min. increments	± 0.05 mg/L for values < 1mg/L ± 0.2 mg/L for values > 1 mg/L	± 0.1	± 10 mV	± 0.1°	± 10 for values < 1,000 ± 20 for values > 1,000	± 10%	

Qualitative Observations: NA

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Micropurge Groundwater Sampling Data Sheet

Well Name:	MW-02	**Screen Interval:**	
Well Location:	South Side of Building	**Sample Depth:**	~16ft below TOC (Lowest)
Project:	CenturyLink - Longview	**Static Water Level:**	12.40 ft below TOC (with tubing)
Sample Date:	3/19/20	**Depth to LNAPL:**	NA
Sampling Personnel:	Danielle Gibson	**Total Depth of Casing:**	19.93'
Sample ID:	MW-02	**Begin Purge (Time):**	1750
Sample Time:	1838	**Casing Diameter (inches):**	2 inch
Duplicate ID:	NA	**Purge Method:**	Peristaltic
Field QC Designation:	NA	**Actual Final Purge Volume:**	~8,400 mL
		Immiscible Layer Present:	No

Water Quality Information

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (~~µmhos~~/cm)	Turbidity (NTU)	Depth to Water (ft)
INST 1755 DO	175	66.8%, 6.51 mg/L	6.52	296.3	16.7	581.0	11.9	12.40
1802	175	70.8%, 6.94 mg/L	6.79	294.1	16.7	556.6	14.5	12.41
1805	175	70.8%, 6.92 mg/L	6.68	294.4	16.7	545.7	16.1	12.41
1808	175	68.2%, 6.67 mg/L	6.66	294.9	16.7	536.9	13.9	12.41
1811	175	64.7%, 6.32 mg/L	6.62	295.4	16.6	528.9	13.5	12.40
1814	175	64.1%, 6.15 mg/L	6.62	295.3	16.5	510.6	15.9	12.41
1817	175	62.9%, 6.16 mg/L	6.64	295.6	16.5	505.5	15.7	12.42
1820	175	63.8%, 6.23 mg/L	6.59	295.9	16.5	497.1	15.4	12.42
1823	175	62.7%, 6.15 mg/L	6.61	296.1	16.5	484.7	15.4	12.42
1826	175	65.4%, 6.45 mg/L	6.60	296.5	16.5	484.9	12.5	12.42
1829	175	62.0%, 6.09 mg/L	6.56	296.8	16.5	476.3	12.3	12.42
1832	175	61.6%, 6.05 mg/L	~~6.44~~ 6.58	296.8	16.4	455.3	12.7	12.42
1835	175	60.2%, DO 5.95 mg/L	6.56	297.3	16.5	459.8	9.89	12.42
1838	175	61.7%, 6.07 mg/L	6.63	298.2	16.4	468.1	7.49	12.42
								DB

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Water Quality Information								
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbity (NTU)	Depth to Water (ft)
								DTW
Stabilization Criteria	3 min. increments	± 0.05 mg/L for values < 1mg/L ± 0.2 mg/L for values > 1 mg/L	± 0.1	± 10 mV	± 0.1°	± 10 for values < 1,000 ± 20 for values > 1,000	± 10%	

Qualitative Observations: Tubing caught on joint; however, able to move past joint.

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Well Name:	MW-03	**Screen Interval:**	
Well Location:	East Side of Building	**Sample Depth:**	~16 ft below TOC
Project:	CenturyLink - Longview	**Static Water Level:**	11.16 ft below TOC (with tubing)
Sample Date:	3/19/20	**Depth to LNAPL:**	NA
Sampling Personnel:	Danielle Gibson	**Total Depth of Casing:**	19.93'
Sample ID:	MW-03	**Begin Purge (Time):**	1541
Sample Time:	1628	**Casing Diameter (inches):**	2 in.
Duplicate ID:	NA	**Purge Method:**	Peristaltic
Field QC Designation:	MS/MSD	**Actual Final Purge Volume:**	~9,125 mL
		Immiscible Layer Present:	No

Water Quality Information

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (~~µmhos~~/cm) MS/MSD XS	Turbidity ~~Turbity~~ (NTU)	Depth to Water (ft)
1555	175	84.2%, 8.40 mg/L	6.58	259.0	15.6	307.1	7.55	11.21
1558	175	81.4%, 7.96 mg/L	6.63	254.6	15.5	302.0	5.13	11.20
1601	175	78.5%, 7.93 mg/L	6.70	252.1	15.5	300.0	5.00	11.20
1608	220	73.3%, 7.44 mg/L	6.40	254.0	15.1	297.9	8.43	11.20
1611	220	73.8%, 7.46 mg/L	6.27	252.4	15.1	298.4	5.64	11.20
1614	220	73.8%, 7.46 mg/L	6.41	250.7	15.1	297.3	2.82	11.20
1617	220	73.9%, 7.48 mg/L	6.50	250.5	15.1	299.7	3.10	11.20
1620	220	73.4%, 7.44 mg/L	6.46	249.6	15.0	302.1	1.25	11.20
1623	220	73.6%, 7.46 mg/L	6.45	251.0	15.0	297.1	unknown	11.20
1628	220	73.9%, 7.50 mg/L	6.37	255.0	14.9	297.5	unknown	11.20

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Water Quality Information								
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbity (NTU)	Depth to Water (ft)
Stabilization Criteria	3 min. increments	± 0.05 mg/L for values < 1mg/L ± 0.2 mg/L for values > 1 mg/L	± 0.1	± 10 mV	± 0.1°	± 10 for values < 1,000 ± 20 for values > 1,000	± 10%	

Qualitative Observations: Some particles in water noted. Turbidity indicated underranged during last two readings; however, previous readings were below 10 NTU, therefore sample collected.

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Well Name:	MW-04	**Screen Interval:**	
Well Location:	North Side of Building	**Sample Depth:**	~16 ft below TOC
Project:	CenturyLink - Longview	**Static Water Level:**	10.78 ft below TOC (with tubing)
		Depth to LNAPL:	NA
Sample Date:	3/19/20	**Total Depth of Casing:**	19.73'
Sampling Personnel:	Danielle Gibson	**Begin Purge (Time):**	1237
		Casing Diameter (inches):	2 inch
Sample ID:	MW-04	**Purge Method:**	Peristaltic
Sample Time:	1321	**Actual Final Purge Volume:**	~6,600 mL
Duplicate ID:	NA	**Immiscible Layer Present:**	No
Field QC Designation:	NA		

Water Quality Information

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (~~µmhos~~ µS/cm)	Turbidity (~~Turbity~~ NTU)	Depth to Water (ft)
1244	150	34.0%, 3.54 mg/L	6.21	235.7	13.7	246.2	17.3	10.79
1247	150	31.3%, 3.26 mg/L	6.19	236.0	13.7	251.3	11.8	10.78
1250	150	29.4%, 3.06 mg/L	6.17	236.3	13.8	252.2	8.83	10.78
~~1253~~ 1255	150	27.6%, 2.87 mg/L	6.07	237.9	13.8	257.1	5.00	10.78
1258	150	26.7%, 2.79 mg/L	6.19	237.9	13.8	260.6	4.22	10.79
1301	150	26.2%, 2.73 mg/L	6.21	238.1	13.8	261.5	4.04	10.78
1304	150	25.1%, 2.60 mg/L	6.23	238.3	13.9	265.7	2.66	10.78
1307	150	24.1%, 2.50 mg/L	6.18	237.9	13.9	267.5	3.01	10.78
1310	150	23.8%, 2.47 mg/L	6.25	238.0	13.9	266.9	2.81	10.78
1313	150	23.3%, 2.43 mg/L	6.13	236.7	13.9	269.8	2.02	10.79
1316	150	22.6%, 2.35 mg/L	6.28	235.9	13.9	269.7	1.68	10.79
1319	150	22.5%, 2.35 mg/L	6.29	233.9	13.9	270.2	1.62	10.79
1321	150	22.0%, 2.30 mg/L	6.22	232.5	13.9	272.0	1.60	10.78
								ND

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Water Quality Information								
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbity (NTU)	Depth to Water (ft)
Stabilization Criteria	3 min. increments	± 0.05 mg/L for values < 1mg/L ± 0.2 mg/L for values > 1 mg/L	± 0.1	± 10 mV	± 0.1°	± 10 for values < 1,000 ± 20 for values > 1,000	± 10%	

Qualitative Observations: Slightly yellow at start of purging

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Well Name:	MW-05	**Screen Interval:**	
Well Location:	North Side of Building	**Sample Depth:**	2/6 ft below TOC
Project:	CenturyLink - Longview	**Static Water Level:**	11.02 ft below TOC (with tubing)
Sample Date:	3/19/20	**Depth to LNAPL:**	NA
Sampling Personnel:	Danielle Gibson	**Total Depth of Casing:**	19.63'
Sample ID:	MW-05	**Begin Purge (Time):**	1402
Sample Time:	1442	**Casing Diameter (inches):**	2 in.
Duplicate ID:	NA	**Purge Method:**	Peristaltic
Field QC Designation:	NA	**Actual Final Purge Volume:**	~ 5,800 mL
		Immiscible Layer Present:	No

Water Quality Information

Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbidity (NTU)	Depth to Water (ft)
1410	145	45.2%, 4.65 mg/L	6.30	263.7	14.5	370.2	3.85	11.01
1413	145	42.3%, 4.33 mg/L	6.46	263.5	14.4	373.4	2.13	11.02
1416	145	39.6%, 4.06 mg/L	6.00	263.4	14.5	372.3	1.67	11.02
1421	145	37.1%, 3.80 mg/L	6.19	263.0	14.5	373.6	1.38	11.02
1424	145	36.3%, 3.71 mg/L	6.51	262.9	14.6	374.8	1.25	11.02
1427	145	37.8%, 3.86 mg/L	6.02	262.8	14.5	373.6	1.54	11.03
1430	145	35.6%, 3.66 mg/L	6.10	262.1	14.5	374.0	1.19	11.02
1433	145	35.0%, 3.59 mg/L	6.04	262.0	14.5	375.2	0.92	11.03
1436	145	35.1%, 3.600 mg/L	6.02	262.1	14.5	377.3	0.80	11.03
1439	145	34.3%, 3.49 mg/L	6.09	262.2	14.5	375.1	0.97	11.02
~~1443~~ 1442	145	33.6%, 3.44 mg/L	6.04	261.9	14.6	377.0	0.82	11.02
								ND

TETRA TECH EM INC.

Micropurge Groundwater Sampling Data Sheet

Water Quality Information								
Time	Discharge Rate (mL/min)	Dissolved Oxygen (mg/L)	pH	Eh/ORP (mV)	Temp (C°)	Sp. Cond (µmhos/cm)	Turbity (NTU)	Depth to Water (ft)
Stabilization Criteria	3 min. increments	± 0.05 mg/L for values < 1mg/L ± 0.2 mg/L for values > 1 mg/L	± 0.1	± 10 mV	± 0.1°	± 10 for values < 1,000 ± 20 for values > 1,000	± 10%	

Qualitative Observations: NA

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

May 08, 2020 Service Request No:K2002483.02

Mark Reisig
Tetra Tech, Inc.
1560 Broadway
Suite 1400
Denver, CO 80202

Laboratory Results for: Century Link - Longview, WA Groundwater

Dear Mark,

Enclosed is the revised report for the sample(s) submitted to our laboratory March 20, 2020. For your reference, these analyses have been assigned our service request number **K2002483.**

The results for the additional PAH compounds have been added as requested.

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

Please contact me if you have any questions. My extension is 3376. You may also contact me via email at Mark.Harris@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Mark Harris
Project Manager

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

REVISED
4:57 pm, May 07, 2020

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, Inc.
Project: Century Link - Longview, WA Groundwater
Sample Matrix: Ground Water

Service Request: K2002483
Date Received: 03/20/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Five ground water samples were received for analysis at ALS Environmental on 03/20/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

No significant anomalies were noted with this analysis.

Semivoa GC:

No significant anomalies were noted with this analysis.

Approved by _____ Date 05/07/2020

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-01			Lab ID: K2002483-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
1-Methylnaphthalene	0.0023	J	0.0013	0.020	ug/L	8270D
2-Methylnaphthalene	0.0023	J	0.0013	0.020	ug/L	8270D
Acenaphthene	0.0014	J	0.0012	0.020	ug/L	8270D
Benz(a)anthracene	0.0021	J	0.00097	0.020	ug/L	8270D
Dibenzofuran	0.0028	J	0.00096	0.020	ug/L	8270D
Fluorene	0.0022	J	0.0011	0.020	ug/L	8270D
Naphthalene	0.0064	J	0.0014	0.020	ug/L	8270D
Phenanthrene	0.0039	J	0.0011	0.020	ug/L	8270D
Diesel Range Organics (DRO)	28	J	12	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	55	J	21	550	ug/L	NWTPH-Dx

CLIENT ID: MW-02			Lab ID: K2002483-002			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
1-Methylnaphthalene	0.0049	J	0.0013	0.020	ug/L	8270D
2-Methylnaphthalene	0.0032	J	0.0013	0.020	ug/L	8270D
Acenaphthene	0.029		0.0012	0.020	ug/L	8270D
Acenaphthylene	0.0015	J	0.0011	0.020	ug/L	8270D
Anthracene	0.0028	J	0.00082	0.020	ug/L	8270D
Benz(a)anthracene	0.0024	J	0.00097	0.020	ug/L	8270D
Dibenzofuran	0.0085	J	0.00096	0.020	ug/L	8270D
Fluoranthene	0.0020	J	0.00082	0.020	ug/L	8270D
Fluorene	0.0036	J	0.0011	0.020	ug/L	8270D
Naphthalene	0.014	J	0.0014	0.020	ug/L	8270D
Phenanthrene	0.0028	J	0.0011	0.020	ug/L	8270D
Pyrene	0.031		0.0010	0.020	ug/L	8270D
Diesel Range Organics (DRO)	220	J	12	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	180	J	21	550	ug/L	NWTPH-Dx

CLIENT ID: MW-03			Lab ID: K2002483-003			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
1-Methylnaphthalene	0.0028	J	0.0013	0.020	ug/L	8270D
2-Methylnaphthalene	0.0039	J	0.0013	0.020	ug/L	8270D
Acenaphthene	0.0013	J	0.0012	0.020	ug/L	8270D
Benz(a)anthracene	0.0021	J	0.00097	0.020	ug/L	8270D
Dibenzofuran	0.0031	J	0.00096	0.020	ug/L	8270D
Fluorene	0.0027	J	0.0011	0.020	ug/L	8270D
Naphthalene	0.0080	J	0.0014	0.020	ug/L	8270D
Phenanthrene	0.0043	J	0.0011	0.020	ug/L	8270D
Diesel Range Organics (DRO)	36	J	13	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	66	J	21	550	ug/L	NWTPH-Dx

SAMPLE DETECTION SUMMARY

CLIENT ID: MW-04			Lab ID: K2002483-004			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Acenaphthene	0.0012	J	0.0012	0.020	ug/L	8270D
Anthracene	0.0011	J	0.00082	0.020	ug/L	8270D
Benz(a)anthracene	0.0021	J	0.00097	0.020	ug/L	8270D
Dibenzofuran	0.0015	J	0.00096	0.020	ug/L	8270D
Fluorene	0.0020	J	0.0011	0.020	ug/L	8270D
Naphthalene	0.0032	J	0.0014	0.020	ug/L	8270D
Phenanthrene	0.0014	J	0.0011	0.020	ug/L	8270D
Pyrene	0.0097	J	0.0010	0.020	ug/L	8270D
Diesel Range Organics (DRO)	36	J	12	270	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	63	J	21	540	ug/L	NWTPH-Dx

CLIENT ID: MW-05			Lab ID: K2002483-005			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
1-Methylnaphthalene	0.0013	J	0.0013	0.020	ug/L	8270D
Acenaphthene	0.0012	J	0.0012	0.020	ug/L	8270D
Anthracene	0.0019	J	0.00082	0.020	ug/L	8270D
Benz(a)anthracene	0.0020	J	0.00097	0.020	ug/L	8270D
Dibenzofuran	0.0017	J	0.00096	0.020	ug/L	8270D
Fluoranthene	0.0011	J	0.00082	0.020	ug/L	8270D
Fluorene	0.0028	J	0.0011	0.020	ug/L	8270D
Naphthalene	0.0040	J	0.0014	0.020	ug/L	8270D
Phenanthrene	0.0021	J	0.0011	0.020	ug/L	8270D
Pyrene	0.0018	J	0.0010	0.020	ug/L	8270D
Diesel Range Organics (DRO)	25	J	12	280	ug/L	NWTPH-Dx
Residual Range Organics (RRO)	42	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, Inc. **Service Request:**K2002483

Project: Century Link - Longview, WA Groundwater/103P3080254

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2002483-001	MW-01	3/19/2020	1117
K2002483-002	MW-02	3/19/2020	1838
K2002483-003	MW-03	3/19/2020	1628
K2002483-004	MW-04	3/19/2020	1321
K2002483-005	MW-05	3/19/2020	1442

ALS Environmental

CHAIN OF CUSTODY
107402

001

SR# K 2002483

COC Set 1 of 1

COC#

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

Project Name: CenturyLink - Longview	Project Number: 103P3080254
Project Manager: Mark Rcisig	
Company: Tetra Tech	
Address: 1560 Broadway St, Suite 1400, Denver, CO 80202	
Phone #: (303) 312-8813	email: Mark.Rcisig@tetratech.com
Sampler Signature: Danielle L. Gibson	Sampler Printed Name: Danielle Gibson

CLIENT SAMPLE ID	LABID	SAMPLING Date	SAMPLING Time	Matrix	NUMBER OF CONTAINERS	7D: 8270D / PAH SIM	14D: Filter SVM / Filter SVM	14D: NWTPH-Dx / NW_TPH	1	2	3	4	5	Remarks
1. MW-01		3/19/20	1117	GW	5	X	X	X						
2. MW-02			1838		5									
3. MW-03			1628		15									MS/MSD
4. MW-04			1321		5									
5. MW-05			1442		5									
6.														
7.														
8.														
9.														
10.														

Report Requirements

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

Invoice Information

P.O.#
Bill To:

Turnaround Requirements

___ 24 hr. ___ 48 hr.
___ 5 Day
___ Standard

Requested Report Date

Circle which metals are to be analyzed

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

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

Special Instructions/Comments:

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

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: Danielle L. Gibson	Signature: Cody Graves	Signature	Signature	Signature	Signature
Printed Name: Danielle Gibson	Printed Name: ALS	Printed Name	Printed Name	Printed Name	Printed Name
Firm: Tetra Tech	Firm: 3/20/2020 1150	Firm	Firm	Firm	Firm
Date/Time: 3/20/20 1150	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

PC MH

Cooler Receipt and Preservation Form

Client Tetra Tech Service Request *K20* 02483

Received: 3/20/20 Opened: 3/20/20 By: BR Unloaded: 3/20/20 By: BR

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

Temp Blank	Sample 1	Sample 2	Sample 3	Sample 4	IR GUN	Cooler / COC ID NA	Tracking Number NA	Filed
3.7	-	-	-	-	298004800NS			
2.3	-	-	-	-				
1.7	-	-	-	-				

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

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.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

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
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REVISED
4:57 pm, May 07, 2020

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

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 11:17
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-01	**Units:**	ug/L
Lab Code:	K2002483-001	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	**0.0023 J**	0.020	0.0013	1	03/25/20 11:28	3/23/20	
2-Methylnaphthalene	**0.0023 J**	0.020	0.0013	1	03/27/20 14:06	3/25/20	
Acenaphthene	**0.0014 J**	0.020	0.0012	1	03/27/20 14:06	3/25/20	
Acenaphthylene	ND U	0.020	0.0011	1	03/27/20 14:06	3/25/20	
Anthracene	ND U	0.020	0.00082	1	03/27/20 14:06	3/25/20	
Benz(a)anthracene	**0.0021 J**	0.020	0.00097	1	03/27/20 14:06	3/25/20	
Benzo(a)pyrene	ND U	0.020	0.0011	1	03/27/20 14:06	3/25/20	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	03/27/20 14:06	3/25/20	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	03/27/20 14:06	3/25/20	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	03/27/20 14:06	3/25/20	
Carbazole	ND U	0.020	0.0011	1	03/25/20 11:28	3/23/20	*
Chrysene	ND U	0.020	0.00076	1	03/27/20 14:06	3/25/20	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	03/27/20 14:06	3/25/20	
Dibenzofuran	**0.0028 J**	0.020	0.00096	1	03/27/20 14:06	3/25/20	
Fluoranthene	ND U	0.020	0.00082	1	03/27/20 14:06	3/25/20	
Fluorene	**0.0022 J**	0.020	0.0011	1	03/27/20 14:06	3/25/20	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	03/27/20 14:06	3/25/20	
Naphthalene	**0.0064 J**	0.020	0.0014	1	03/27/20 14:06	3/25/20	
Phenanthrene	**0.0039 J**	0.020	0.0011	1	03/27/20 14:06	3/25/20	
Pyrene	ND U	0.020	0.0010	1	03/27/20 14:06	3/25/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	96	42 - 133	03/27/20 14:06	
Fluorene-d10	105	42 - 131	03/27/20 14:06	
Terphenyl-d14	94	32 - 129	03/27/20 14:06	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 18:38
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-02	**Units:**	ug/L
Lab Code:	K2002483-002	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	**0.0049**	**J**	0.020	0.0013	1	03/25/20 11:51	3/23/20	
2-Methylnaphthalene	**0.0032**	**J**	0.020	0.0013	1	03/27/20 14:29	3/25/20	
Acenaphthene	**0.029**		0.020	0.0012	1	03/27/20 14:29	3/25/20	
Acenaphthylene	**0.0015**	**J**	0.020	0.0011	1	03/27/20 14:29	3/25/20	
Anthracene	**0.0028**	**J**	0.020	0.00082	1	03/27/20 14:29	3/25/20	
Benz(a)anthracene	**0.0024**	**J**	0.020	0.00097	1	03/27/20 14:29	3/25/20	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	03/27/20 14:29	3/25/20	
Benzo(b)fluoranthene	ND	U	0.020	0.00083	1	03/27/20 14:29	3/25/20	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	03/27/20 14:29	3/25/20	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	03/27/20 14:29	3/25/20	
Carbazole	ND	U	0.020	0.0011	1	03/25/20 11:51	3/23/20	*
Chrysene	ND	U	0.020	0.00076	1	03/27/20 14:29	3/25/20	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	03/27/20 14:29	3/25/20	
Dibenzofuran	**0.0085**	**J**	0.020	0.00096	1	03/27/20 14:29	3/25/20	
Fluoranthene	**0.0020**	**J**	0.020	0.00082	1	03/27/20 14:29	3/25/20	
Fluorene	**0.0036**	**J**	0.020	0.0011	1	03/27/20 14:29	3/25/20	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	03/27/20 14:29	3/25/20	
Naphthalene	**0.014**	**J**	0.020	0.0014	1	03/27/20 14:29	3/25/20	
Phenanthrene	**0.0028**	**J**	0.020	0.0011	1	03/27/20 14:29	3/25/20	
Pyrene	**0.031**		0.020	0.0010	1	03/27/20 14:29	3/25/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	94	42 - 133	03/27/20 14:29	
Fluorene-d10	103	42 - 131	03/27/20 14:29	
Terphenyl-d14	88	32 - 129	03/27/20 14:29	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 16:28
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-03	**Units:**	ug/L
Lab Code:	K2002483-003	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	**0.0028 J**	0.020	0.0013	1	03/25/20 11:05	3/23/20	
2-Methylnaphthalene	**0.0039 J**	0.020	0.0013	1	03/27/20 13:43	3/25/20	
Acenaphthene	**0.0013 J**	0.020	0.0012	1	03/27/20 13:43	3/25/20	
Acenaphthylene	ND U	0.020	0.0011	1	03/27/20 13:43	3/25/20	
Anthracene	ND U	0.020	0.00082	1	03/27/20 13:43	3/25/20	
Benz(a)anthracene	**0.0021 J**	0.020	0.00097	1	03/27/20 13:43	3/25/20	
Benzo(a)pyrene	ND U	0.020	0.0011	1	03/27/20 13:43	3/25/20	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	03/27/20 13:43	3/25/20	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	03/27/20 13:43	3/25/20	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	03/27/20 13:43	3/25/20	
Carbazole	ND U	0.020	0.0011	1	03/25/20 11:05	3/23/20	*
Chrysene	ND U	0.020	0.00076	1	03/27/20 13:43	3/25/20	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	03/27/20 13:43	3/25/20	
Dibenzofuran	**0.0031 J**	0.020	0.00096	1	03/27/20 13:43	3/25/20	
Fluoranthene	ND U	0.020	0.00082	1	03/27/20 13:43	3/25/20	
Fluorene	**0.0027 J**	0.020	0.0011	1	03/27/20 13:43	3/25/20	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	03/27/20 13:43	3/25/20	
Naphthalene	**0.0080 J**	0.020	0.0014	1	03/27/20 13:43	3/25/20	
Phenanthrene	**0.0043 J**	0.020	0.0011	1	03/27/20 13:43	3/25/20	
Pyrene	ND U	0.020	0.0010	1	03/27/20 13:43	3/25/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	92	42 - 133	03/27/20 13:43	
Fluorene-d10	100	42 - 131	03/27/20 13:43	
Terphenyl-d14	91	32 - 129	03/27/20 13:43	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 13:21
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-04	**Units:**	ug/L
Lab Code:	K2002483-004	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND U	0.020	0.0013	1	03/25/20 12:13	3/23/20	
2-Methylnaphthalene	ND U	0.020	0.0013	1	03/27/20 14:51	3/25/20	
Acenaphthene	**0.0012 J**	0.020	0.0012	1	03/27/20 14:51	3/25/20	
Acenaphthylene	ND U	0.020	0.0011	1	03/27/20 14:51	3/25/20	
Anthracene	**0.0011 J**	0.020	0.00082	1	03/27/20 14:51	3/25/20	
Benz(a)anthracene	**0.0021 J**	0.020	0.00097	1	03/27/20 14:51	3/25/20	
Benzo(a)pyrene	ND U	0.020	0.0011	1	03/27/20 14:51	3/25/20	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	03/27/20 14:51	3/25/20	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	03/27/20 14:51	3/25/20	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	03/27/20 14:51	3/25/20	
Carbazole	ND U	0.020	0.0011	1	03/25/20 12:13	3/23/20	*
Chrysene	ND U	0.020	0.00076	1	03/27/20 14:51	3/25/20	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	03/27/20 14:51	3/25/20	
Dibenzofuran	**0.0015 J**	0.020	0.00096	1	03/27/20 14:51	3/25/20	
Fluoranthene	ND U	0.020	0.00082	1	03/27/20 14:51	3/25/20	
Fluorene	**0.0020 J**	0.020	0.0011	1	03/27/20 14:51	3/25/20	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	03/27/20 14:51	3/25/20	
Naphthalene	**0.0032 J**	0.020	0.0014	1	03/27/20 14:51	3/25/20	
Phenanthrene	**0.0014 J**	0.020	0.0011	1	03/27/20 14:51	3/25/20	
Pyrene	**0.0097 J**	0.020	0.0010	1	03/27/20 14:51	3/25/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	96	42 - 133	03/27/20 14:51	
Fluorene-d10	104	42 - 131	03/27/20 14:51	
Terphenyl-d14	94	32 - 129	03/27/20 14:51	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 14:42
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-05	**Units:**	ug/L
Lab Code:	K2002483-005	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	**0.0013 J**	0.020	0.0013	1	03/25/20 12:36	3/23/20	
2-Methylnaphthalene	ND U	0.020	0.0013	1	03/27/20 15:14	3/25/20	
Acenaphthene	**0.0012 J**	0.020	0.0012	1	03/27/20 15:14	3/25/20	
Acenaphthylene	ND U	0.020	0.0011	1	03/27/20 15:14	3/25/20	
Anthracene	**0.0019 J**	0.020	0.00082	1	03/27/20 15:14	3/25/20	
Benz(a)anthracene	**0.0020 J**	0.020	0.00097	1	03/27/20 15:14	3/25/20	
Benzo(a)pyrene	ND U	0.020	0.0011	1	03/27/20 15:14	3/25/20	
Benzo(b)fluoranthene	ND U	0.020	0.00083	1	03/27/20 15:14	3/25/20	
Benzo(g,h,i)perylene	ND U	0.020	0.00086	1	03/27/20 15:14	3/25/20	
Benzo(k)fluoranthene	ND U	0.020	0.00094	1	03/27/20 15:14	3/25/20	
Carbazole	ND U	0.020	0.0011	1	03/25/20 12:36	3/23/20	*
Chrysene	ND U	0.020	0.00076	1	03/27/20 15:14	3/25/20	
Dibenz(a,h)anthracene	ND U	0.020	0.0013	1	03/27/20 15:14	3/25/20	
Dibenzofuran	**0.0017 J**	0.020	0.00096	1	03/27/20 15:14	3/25/20	
Fluoranthene	**0.0011 J**	0.020	0.00082	1	03/27/20 15:14	3/25/20	
Fluorene	**0.0028 J**	0.020	0.0011	1	03/27/20 15:14	3/25/20	
Indeno(1,2,3-cd)pyrene	ND U	0.020	0.00089	1	03/27/20 15:14	3/25/20	
Naphthalene	**0.0040 J**	0.020	0.0014	1	03/27/20 15:14	3/25/20	
Phenanthrene	**0.0021 J**	0.020	0.0011	1	03/27/20 15:14	3/25/20	
Pyrene	**0.0018 J**	0.020	0.0010	1	03/27/20 15:14	3/25/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	95	42 - 133	03/27/20 15:14	
Fluorene-d10	104	42 - 131	03/27/20 15:14	
Terphenyl-d14	92	32 - 129	03/27/20 15:14	

Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
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Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 11:17
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-01	**Units:**	ug/L
Lab Code:	K2002483-001	**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)	**28 J**	280	12	1	03/31/20 22:16	3/26/20	
Residual Range Organics (RRO)	**55 J**	550	21	1	03/31/20 22:16	3/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	85	50 - 150	03/31/20 22:16	
n-Triacontane	76	50 - 150	03/31/20 22:16	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 18:38
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-02	**Units:**	ug/L
Lab Code:	K2002483-002	**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)	**220 J**	280	12	1	03/31/20 22:39	3/26/20	
Residual Range Organics (RRO)	**180 J**	550	21	1	03/31/20 22:39	3/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	75	50 - 150	03/31/20 22:39	
n-Triacontane	66	50 - 150	03/31/20 22:39	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 16:28
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-03	**Units:**	ug/L
Lab Code:	K2002483-003	**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)	**36 J**	280	13	1	03/31/20 23:01	3/26/20	
Residual Range Organics (RRO)	**66 J**	550	21	1	03/31/20 23:01	3/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	85	50 - 150	03/31/20 23:01	
n-Triacontane	76	50 - 150	03/31/20 23:01	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 13:21
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-04	**Units:**	ug/L
Lab Code:	K2002483-004	**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)	**36 J**	270	12	1	03/31/20 23:46	3/26/20	
Residual Range Organics (RRO)	**63 J**	540	21	1	03/31/20 23:46	3/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	90	50 - 150	03/31/20 23:46	
n-Triacontane	81	50 - 150	03/31/20 23:46	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20 14:42
Sample Matrix:	Ground Water	**Date Received:**	03/20/20 11:50
Sample Name:	MW-05	**Units:**	ug/L
Lab Code:	K2002483-005	**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)	**25 J**	280	12	1	04/01/20 00:08	3/26/20	
Residual Range Organics (RRO)	**42 J**	550	21	1	04/01/20 00:08	3/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	79	50 - 150	04/01/20 00:08	
n-Triacontane	74	50 - 150	04/01/20 00:08	

QC Summary Forms

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Semivolatile Organic Compounds by GC/MS

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Client: Tetra Tech, Inc. **Service Request:** K2002483

Project: Century Link - Longview, WA Groundwater/103P3080254

Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY
Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D

Extraction Method: EPA 3511

Sample Name	Lab Code	Fluoranthene-d10 42-133	Fluorene-d10 42-131	Terphenyl-d14 32-129
MW-01	K2002483-001	96	105	94
MW-02	K2002483-002	94	103	88
MW-03	K2002483-003	92	100	91
MW-04	K2002483-004	96	104	94
MW-05	K2002483-005	95	104	92
Method Blank	KQ2004039-04	95	101	60
Method Blank	KQ2004189-04	92	100	86
Lab Control Sample	KQ2004039-03	98	98	69
Lab Control Sample	KQ2004189-03	94	98	77
MW-03	KQ2004039-01	95	96	67
MW-03	KQ2004039-02	99	98	60
MW-03	KQ2004189-01	98	100	94
MW-03	KQ2004189-02	100	104	99

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20
Sample Matrix:	Ground Water	**Date Received:**	03/20/20
		Date Analyzed:	03/25/20
		Date Extracted:	03/23/20

Duplicate Matrix Spike Summary
Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Sample Name:	MW-03	**Units:**	ug/L
Lab Code:	K2002483-003	**Basis:**	NA
Analysis Method:	8270D		
Prep Method:	EPA 3511		

		Matrix Spike KQ2004039-01			Duplicate Matrix Spike KQ2004039-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1-Methylnaphthalene	0.0028 J	2.64	2.78	95	2.66	2.78	96	57-113	<1	30
2-Methylnaphthalene	0.0039 J	2.63	2.78	95	2.67	2.78	96	58-111	1	30
Acenaphthene	0.0013 J	3.04	2.78	109	3.05	2.78	110	63-121	<1	30
Acenaphthylene	ND U	3.14	2.78	113	3.12	2.78	112	61-118	<1	30
Anthracene	ND U	3.23	2.78	116	3.25	2.78	117	69-125	<1	30
Benz(a)anthracene	0.0021 J	3.02	2.78	109	3.01	2.78	108	71-127	<1	30
Benzo(a)pyrene	ND U	3.02	2.78	109	3.03	2.78	109	69-132	<1	30
Benzo(b)fluoranthene	ND U	2.97	2.78	107	3.00	2.78	108	65-139	<1	30
Benzo(g,h,i)perylene	ND U	3.14	2.78	113	3.16	2.78	114	63-129	<1	30
Benzo(k)fluoranthene	ND U	3.12	2.78	112	3.15	2.78	113	65-137	<1	30
Carbazole	ND U	1.98	2.78	71	2.03	2.78	73	70-130	3	30
Chrysene	ND U	3.05	2.78	110	3.05	2.78	110	75-130	<1	30
Dibenz(a,h)anthracene	ND U	3.40	2.78	123	3.41	2.78	123	61-138	<1	30
Dibenzofuran	0.0031 J	2.90	2.78	104	2.89	2.78	104	62-127	<1	30
Fluoranthene	ND U	2.81	2.78	101	2.86	2.78	103	69-125	2	30
Fluorene	0.0027 J	2.95	2.78	106	2.95	2.78	106	66-123	<1	30
Indeno(1,2,3-cd)pyrene	ND U	3.09	2.78	111	3.11	2.78	112	62-142	<1	30
Naphthalene	0.0080 J	2.80	2.78	100	2.85	2.78	102	45-123	2	30
Phenanthrene	0.0043 J	2.90	2.78	104	2.93	2.78	105	65-124	1	30
Pyrene	ND U	3.06	2.78	110	3.07	2.78	110	59-134	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20
Sample Matrix:	Ground Water	**Date Received:**	03/20/20
		Date Analyzed:	03/27/20
		Date Extracted:	03/25/20

Duplicate Matrix Spike Summary
Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Sample Name:	MW-03	**Units:**	ug/L
Lab Code:	K2002483-003	**Basis:**	NA
Analysis Method:	8270D		
Prep Method:	EPA 3511		

		Matrix Spike KQ2004189-01			**Duplicate Matrix Spike** KQ2004189-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1-Methylnaphthalene	0.0028 J	1.93	2.78	69	1.96	2.78	71	57-113	2	30
2-Methylnaphthalene	0.0039 J	1.94	2.78	70	1.96	2.78	71	58-111	1	30
Acenaphthene	0.0013 J	2.22	2.78	80	2.31	2.78	83	63-121	4	30
Acenaphthylene	ND U	2.26	2.78	81	2.33	2.78	84	61-118	3	30
Anthracene	ND U	2.40	2.78	86	2.45	2.78	88	69-125	2	30
Benz(a)anthracene	0.0021 J	2.20	2.78	79	2.24	2.78	81	71-127	2	30
Benzo(a)pyrene	ND U	2.22	2.78	80	2.24	2.78	81	69-132	1	30
Benzo(b)fluoranthene	ND U	2.18	2.78	79	2.23	2.78	80	65-139	2	30
Benzo(g,h,i)perylene	ND U	2.33	2.78	84	2.38	2.78	86	63-129	2	30
Benzo(k)fluoranthene	ND U	2.32	2.78	83	2.39	2.78	86	65-137	3	30
Carbazole	ND U	1.38	2.78	50 *	1.39	2.78	50 *	70-130	<1	30
Chrysene	ND U	2.23	2.78	80	2.29	2.78	82	75-130	2	30
Dibenz(a,h)anthracene	ND U	2.47	2.78	89	2.51	2.78	90	61-138	1	30
Dibenzofuran	0.0031 J	2.14	2.78	77	2.19	2.78	79	62-127	3	30
Fluoranthene	ND U	2.04	2.78	73	2.08	2.78	75	69-125	2	30
Fluorene	0.0027 J	2.17	2.78	78	2.25	2.78	81	66-123	3	30
Indeno(1,2,3-cd)pyrene	ND U	2.22	2.78	80	2.26	2.78	82	62-142	2	30
Naphthalene	0.0080 J	2.09	2.78	75	2.14	2.78	77	45-123	2	30
Phenanthrene	0.0043 J	2.15	2.78	77	2.20	2.78	79	65-124	2	30
Pyrene	ND U	2.30	2.78	83	2.35	2.78	85	59-134	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2004039-04	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND	U	0.020	0.0013	1	03/25/20 09:10	3/23/20	
2-Methylnaphthalene	ND	U	0.020	0.0013	1	03/25/20 09:10	3/23/20	
Acenaphthene	ND	U	0.020	0.0012	1	03/25/20 09:10	3/23/20	
Acenaphthylene	ND	U	0.020	0.0011	1	03/25/20 09:10	3/23/20	
Anthracene	ND	U	0.020	0.00082	1	03/25/20 09:10	3/23/20	
Benz(a)anthracene	**0.0020**	**J**	0.020	0.00097	1	03/25/20 09:10	3/23/20	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	03/25/20 09:10	3/23/20	
Benzo(b)fluoranthene	ND	U	0.020	0.00083	1	03/25/20 09:10	3/23/20	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	03/25/20 09:10	3/23/20	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	03/25/20 09:10	3/23/20	
Carbazole	ND	U	0.020	0.0011	1	03/25/20 09:10	3/23/20	
Chrysene	ND	U	0.020	0.00076	1	03/25/20 09:10	3/23/20	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	03/25/20 09:10	3/23/20	
Dibenzofuran	**0.0010**	**J**	0.020	0.00096	1	03/25/20 09:10	3/23/20	
Fluoranthene	ND	U	0.020	0.00082	1	03/25/20 09:10	3/23/20	
Fluorene	ND	U	0.020	0.0011	1	03/25/20 09:10	3/23/20	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	03/25/20 09:10	3/23/20	
Naphthalene	**0.0023**	**J**	0.020	0.0014	1	03/25/20 09:10	3/23/20	
Phenanthrene	ND	U	0.020	0.0011	1	03/25/20 09:10	3/23/20	
Pyrene	ND	U	0.020	0.0010	1	03/25/20 09:10	3/23/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	95	42 - 133	03/25/20 09:10	
Fluorene-d10	101	42 - 131	03/25/20 09:10	
Terphenyl-d14	60	32 - 129	03/25/20 09:10	

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ2004189-04	**Basis:**	NA

Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method: 8270D
Prep Method: EPA 3511

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
1-Methylnaphthalene	ND	U	0.020	0.0013	1	03/27/20 12:11	3/25/20	
2-Methylnaphthalene	ND	U	0.020	0.0013	1	03/27/20 12:11	3/25/20	
Acenaphthene	ND	U	0.020	0.0012	1	03/27/20 12:11	3/25/20	
Acenaphthylene	ND	U	0.020	0.0011	1	03/27/20 12:11	3/25/20	
Anthracene	ND	U	0.020	0.00082	1	03/27/20 12:11	3/25/20	
Benz(a)anthracene	**0.0018**	**J**	0.020	0.00097	1	03/27/20 12:11	3/25/20	
Benzo(a)pyrene	ND	U	0.020	0.0011	1	03/27/20 12:11	3/25/20	
Benzo(b)fluoranthene	ND	U	0.020	0.00083	1	03/27/20 12:11	3/25/20	
Benzo(g,h,i)perylene	ND	U	0.020	0.00086	1	03/27/20 12:11	3/25/20	
Benzo(k)fluoranthene	ND	U	0.020	0.00094	1	03/27/20 12:11	3/25/20	
Carbazole	ND	U	0.020	0.0011	1	03/27/20 12:11	3/25/20	
Chrysene	ND	U	0.020	0.00076	1	03/27/20 12:11	3/25/20	
Dibenz(a,h)anthracene	ND	U	0.020	0.0013	1	03/27/20 12:11	3/25/20	
Dibenzofuran	**0.0012**	**J**	0.020	0.00096	1	03/27/20 12:11	3/25/20	
Fluoranthene	ND	U	0.020	0.00082	1	03/27/20 12:11	3/25/20	
Fluorene	ND	U	0.020	0.0011	1	03/27/20 12:11	3/25/20	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.00089	1	03/27/20 12:11	3/25/20	
Naphthalene	**0.0022**	**J**	0.020	0.0014	1	03/27/20 12:11	3/25/20	
Phenanthrene	**0.0020**	**J**	0.020	0.0011	1	03/27/20 12:11	3/25/20	
Pyrene	ND	U	0.020	0.0010	1	03/27/20 12:11	3/25/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Fluoranthene-d10	92	42 - 133	03/27/20 12:11	
Fluorene-d10	100	42 - 131	03/27/20 12:11	
Terphenyl-d14	86	32 - 129	03/27/20 12:11	

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Analyzed:**	03/25/20
Sample Matrix:	Ground Water	**Date Extracted:**	03/23/20

Lab Control Sample Summary
Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method:	8270D	**Units:**	ug/L
Prep Method:	EPA 3511	**Basis:**	NA
		Analysis Lot:	674527

Lab Control Sample
KQ2004039-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1-Methylnaphthalene	2.57	2.78	92	47-119
2-Methylnaphthalene	2.56	2.78	92	48-120
Acenaphthene	2.97	2.78	107	63-121
Acenaphthylene	3.06	2.78	110	58-124
Anthracene	3.17	2.78	114	68-127
Benz(a)anthracene	3.01	2.78	109	74-124
Benzo(a)pyrene	2.97	2.78	107	75-131
Benzo(b)fluoranthene	2.95	2.78	106	73-136
Benzo(g,h,i)perylene	3.07	2.78	110	63-127
Benzo(k)fluoranthene	3.05	2.78	110	74-134
Carbazole	2.00	2.78	72	68-135
Chrysene	3.02	2.78	109	74-132
Dibenz(a,h)anthracene	3.33	2.78	120	59-135
Dibenzofuran	2.83	2.78	102	56-132
Fluoranthene	2.77	2.78	100	70-127
Fluorene	2.87	2.78	103	68-121
Indeno(1,2,3-cd)pyrene	3.07	2.78	111	63-136
Naphthalene	2.73	2.78	98	52-115
Phenanthrene	2.85	2.78	103	64-126
Pyrene	3.05	2.78	110	72-127

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Analyzed:**	03/27/20
Sample Matrix:	Ground Water	**Date Extracted:**	03/25/20

Lab Control Sample Summary
Polycyclic Aromatic Hydrocarbons by GC/MS SIM

Analysis Method:	8270D	**Units:**	ug/L
Prep Method:	EPA 3511	**Basis:**	NA
		Analysis Lot:	675072

Lab Control Sample
KQ2004189-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
1-Methylnaphthalene	1.99	2.78	72	47-119
2-Methylnaphthalene	1.99	2.78	72	48-120
Acenaphthene	2.31	2.78	83	63-121
Acenaphthylene	2.34	2.78	84	58-124
Anthracene	2.47	2.78	89	68-127
Benz(a)anthracene	2.25	2.78	81	74-124
Benzo(a)pyrene	2.26	2.78	81	75-131
Benzo(b)fluoranthene	2.24	2.78	81	73-136
Benzo(g,h,i)perylene	2.38	2.78	86	63-127
Benzo(k)fluoranthene	2.38	2.78	86	74-134
Carbazole	1.42	2.78	51 *	68-135
Chrysene	2.31	2.78	83	74-132
Dibenz(a,h)anthracene	2.53	2.78	91	59-135
Dibenzofuran	2.20	2.78	79	56-132
Fluoranthene	2.10	2.78	76	70-127
Fluorene	2.24	2.78	81	68-121
Indeno(1,2,3-cd)pyrene	2.32	2.78	84	63-136
Naphthalene	2.14	2.78	77	52-115
Phenanthrene	2.22	2.78	80	64-126
Pyrene	2.35	2.78	85	72-127

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

Client: Tetra Tech, Inc. **Service Request:** K2002483

Project: Century Link - Longview, WA Groundwater/103P3080254

Sample Matrix: Ground Water

SURROGATE RECOVERY SUMMARY
Diesel and Residual Range Organics

Analysis Method: NWTPH-Dx

Extraction Method: EPA 3510C

Sample Name	Lab Code	n-Triacontane 50 - 150	o-Terphenyl 50 - 150
MW-01	K2002483-001	76	85
MW-02	K2002483-002	66	75
MW-03	K2002483-003	76	85
MW-04	K2002483-004	81	90
MW-05	K2002483-005	74	79
MW-03 DUP	KWG2000889-4	77	82
Lab Control Sample	KWG2000889-5	78	86
Method Blank	KWG2000889-6	75	80

ALS Group USA, Corp.

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QA/QC Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	03/19/20
Sample Matrix:	Ground Water	**Date Received:**	03/20/20
		Date Analyzed:	03/31/20

Replicate Sample Summary
Diesel and Residual Range Organics

Sample Name:	MW-03	**Units:**	ug/L
Lab Code:	K2002483-003	**Basis:**	NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KWG2000889-4 Result	Average	RPD	RPD Limit
Diesel Range Organics (DRO)	NWTPH-Dx	280	12	36 J	32 J	34	11 #	30
Residual Range Organics (RRO)	NWTPH-Dx	550	21	66 J	61 J	63	8 #	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Collected:**	NA
Sample Matrix:	Ground Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG2000889-6	**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)	**13 J**	250	11	1	03/31/20 19:39	3/26/20	
Residual Range Organics (RRO)	**26 J**	500	19	1	03/31/20 19:39	3/26/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
o-Terphenyl	80	50 - 150	03/31/20 19:39	
n-Triacontane	75	50 - 150	03/31/20 19:39	

ALS Group USA, Corp.
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QA/QC Report

Client:	Tetra Tech, Inc.	**Service Request:**	K2002483
Project:	Century Link - Longview, WA Groundwater/103P3080254	**Date Analyzed:**	03/31/20
Sample Matrix:	Ground Water	**Date Extracted:**	03/26/20

Lab Control Sample Summary
Diesel and Residual Range Organics

Analysis Method:	NWTPH-Dx	**Units:**	ug/L
Prep Method:	EPA 3510C	**Basis:**	NA
		Analysis Lot:	KWG2000940

Lab Control Sample
KWG2000889-5

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Diesel Range Organics (DRO)	3650	3200	114	46-140
Residual Range Organics (RRO)	1770	1600	111	45-159