

# Technical Memorandum

---

**TO:** Mohsen Kourehdar, PE, Washington State Department of Ecology  
**FROM:** Christine Kimmel, LG, and Sierra Mott  
**DATE:** January 23, 2018  
**RE:** **Groundwater Quality Results**  
**Dry Season 2017 Long-Term Compliance Monitoring**  
**Cascade Pole Site, Olympia, Washington**

At the request of Mr. Don Bache of the Port of Olympia, we are providing the Washington State Department of Ecology (Ecology) with the results of the Dry Season groundwater sampling event conducted in October 2017 at the Cascade Pole site (Site). Groundwater sampling was conducted as part of the Long-Term Groundwater Compliance Monitoring (LTGCM) program outlined in the amendment to Consent Decree No. DE 00TCPSR-753.

## Groundwater Monitoring

Groundwater elevation measurements were collected on October 11, 2017, and are presented in Table 1. All interior perimeter well groundwater elevations achieved the current hydraulic control goals identified for the Site, except for one well (LW-4R). The groundwater elevation of 15.96 feet (ft) mean lower low water (MLLW) measured at well LW-4R during the October 2017 event exceeded the goal of elevation 15.5 ft MLLW.

A total of 15 water quality samples (14 wells and 1 quality assurance sample) were collected during the dry season sampling event. Samples were collected from the following well pairs: PZ-12 and PZ-13, LW-3 and PZ-17, LW-4R and PZ-18, and MW-02S and PZ-19. Samples were also collected from interior monitoring wells MW-01S, MW-01D, MW-02D, MW-05S, MW-05D, and CW-13. The locations of the sampled wells are shown on Figures 1 and 2.

Groundwater samples were submitted to Analytical Resources Inc. (ARI), located in Tukwila, Washington for analysis of polycyclic aromatic hydrocarbons (PAHs) using US Environmental Protection Agency (EPA) Method 8270D, with select ion monitoring (SIM); follow-up PCP analysis was conducted using EPA Method 8041A if PCP results from initial analyses using EPA Method 8270D(SIM) were below reporting limits at the higher reporting limit; gasoline-range total petroleum hydrocarbons (TPH-G) using Method NWTPH-G; and diesel-range (TPH-D), oil-range TPH (TPH-O), and creosote-range total petroleum hydrocarbons using Method NWTPH-Dx.

## Analytical Results

Analytical results were compared to the cleanup screening levels based on protection of marine surface water previously established for the Site. To evaluate the analytical data for the carcinogenic PAHs (cPAHs), the toxicity equivalency quotients (TEQ) of individual cPAHs were calculated and summed for comparison to the benzo(a)pyrene cleanup level using the methodology established in Washington Administrative Code (WAC) 173-340-708. To calculate the TEQ, the toxicity equivalency

factor (TEF) for a given cPAH compound was multiplied by the compound concentration, or half the reporting limit for compounds that were not detected above the laboratory reporting limit, and the resulting values were summed. The analytical results for the Dry Season sampling event (October 2017) are summarized in Table 2.

An internal data quality evaluation was performed by Landau Associates, Inc. (LAI) on all groundwater analytical data to determine acceptability of the analytical results. The laboratory reports are included in Attachment 1. The data quality evaluation conducted included the following review:

- Chain-of-custody records
- Holding times
- Laboratory method blanks
- Surrogate recoveries
- Laboratory matrix spikes and matrix spike duplicates
- Blank spikes/laboratory control samples
- Laboratory and field duplicates
- Completeness
- Overall assessment of data quality.

The analytical results for the Dry Season monitoring event indicate concentrations below the respective laboratory reporting limits for exterior wells PZ-13, PZ-18, and PZ-19 and interior wells PZ-12, MW-1D, and CW-13. Low-level concentrations below the cleanup screening levels were reported for interior wells LW-4R, MW-02S, MW-02D, MW-05S, and MW-05D. Low-level concentrations of acenaphthene (1.5 µg/L) and 1-methylnaphthalene (1.4 µg/L) at concentrations below the screening levels were detected at exterior well PZ-17; however, these concentrations are within the historical range for this well. Creosote was reported slightly above the cleanup screening level (500 µg/L) at interior shallow well LW-3 (654 µg/L).

Analytical results from shallow interior well MW-01S indicate the following compounds were detected at concentrations above the respective cleanup screening levels: TPH-G (33,900 µg/L), TPH-D (10,300 µg/L), TPH-O (774 µg/L), creosote (40,300 µg/L), along with PCP (5,510 µg/L), total cPAHs (0.71 µg/L), and naphthalene (5,080 µg/L). The Dry Season concentration results are within historical ranges for well MW-01S.

\* \* \* \* \*

The next semiannual sampling event is planned for early 2018 and will include both groundwater elevation monitoring and groundwater quality sample collection at the following well pairs: PZ-12 and PZ-13, LW-3 and PZ-17, LW-4R and PZ-18, and MW-02S and PZ-19, along with samples from interior shallow and deep wells MW-01S, MW-01D, MW-02D, MW-05S, MW-05D, and CW-13.

The results of the Dry Season sampling event (October 2017) and the pending wet season sampling event (early 2018), will be presented in an annual progress report that will summarize the LTGCM program.

## Limitations

This technical memorandum has been prepared for the exclusive use of the Port of Olympia for specific application to the long-term compliance monitoring project at the Cascade Pole Site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

\* \* \* \* \*

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.



Christine B. Kimmel, LG  
Associate



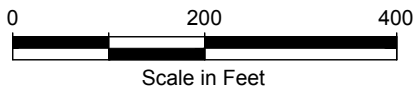
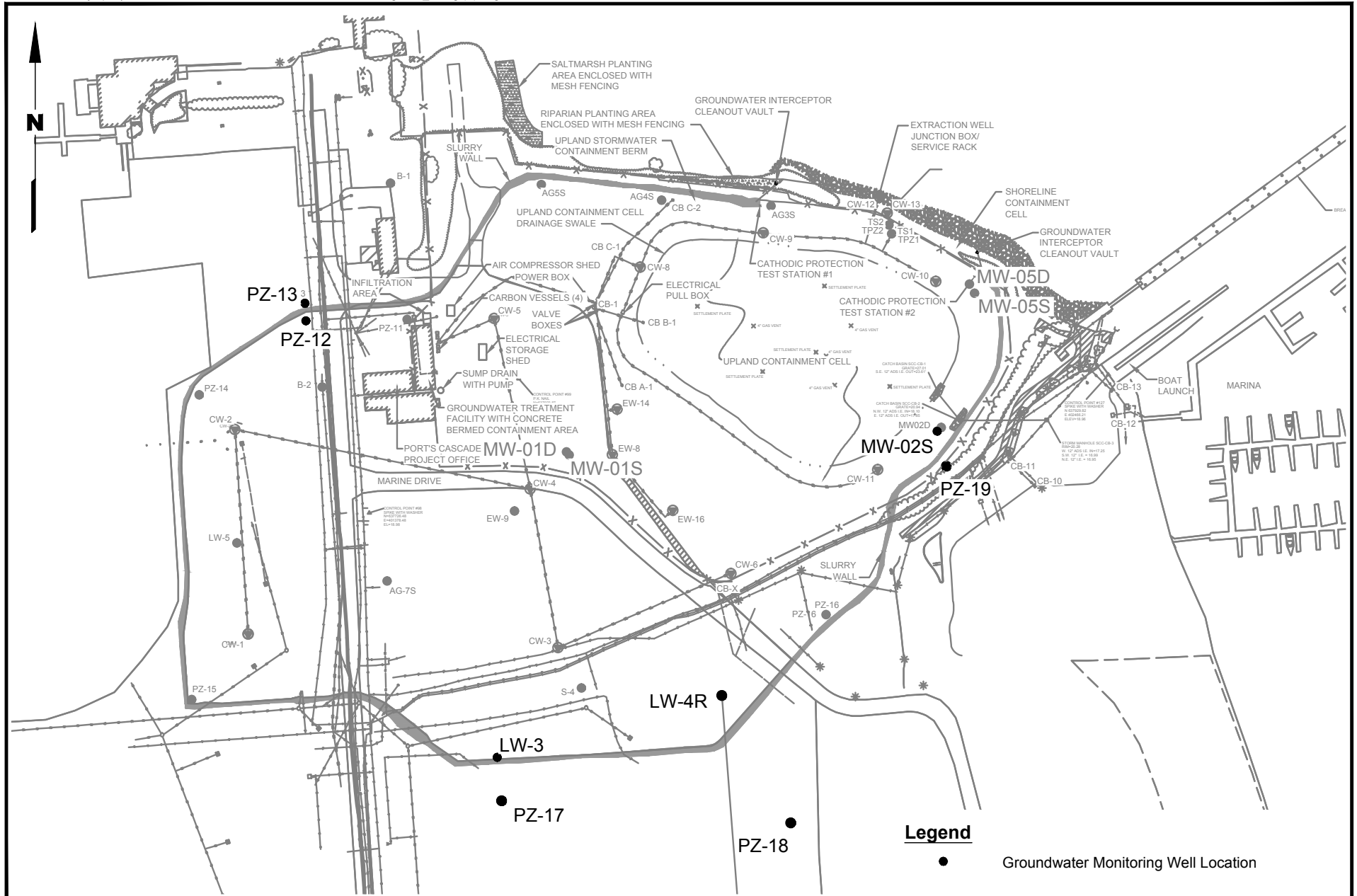
Sierra M. Mott  
Project Scientist

CBK/SMM/tam

P:\021\041\R\Semiannuals\October 2017 LTGCM\October 2017 LTGCM TM 012318.docx

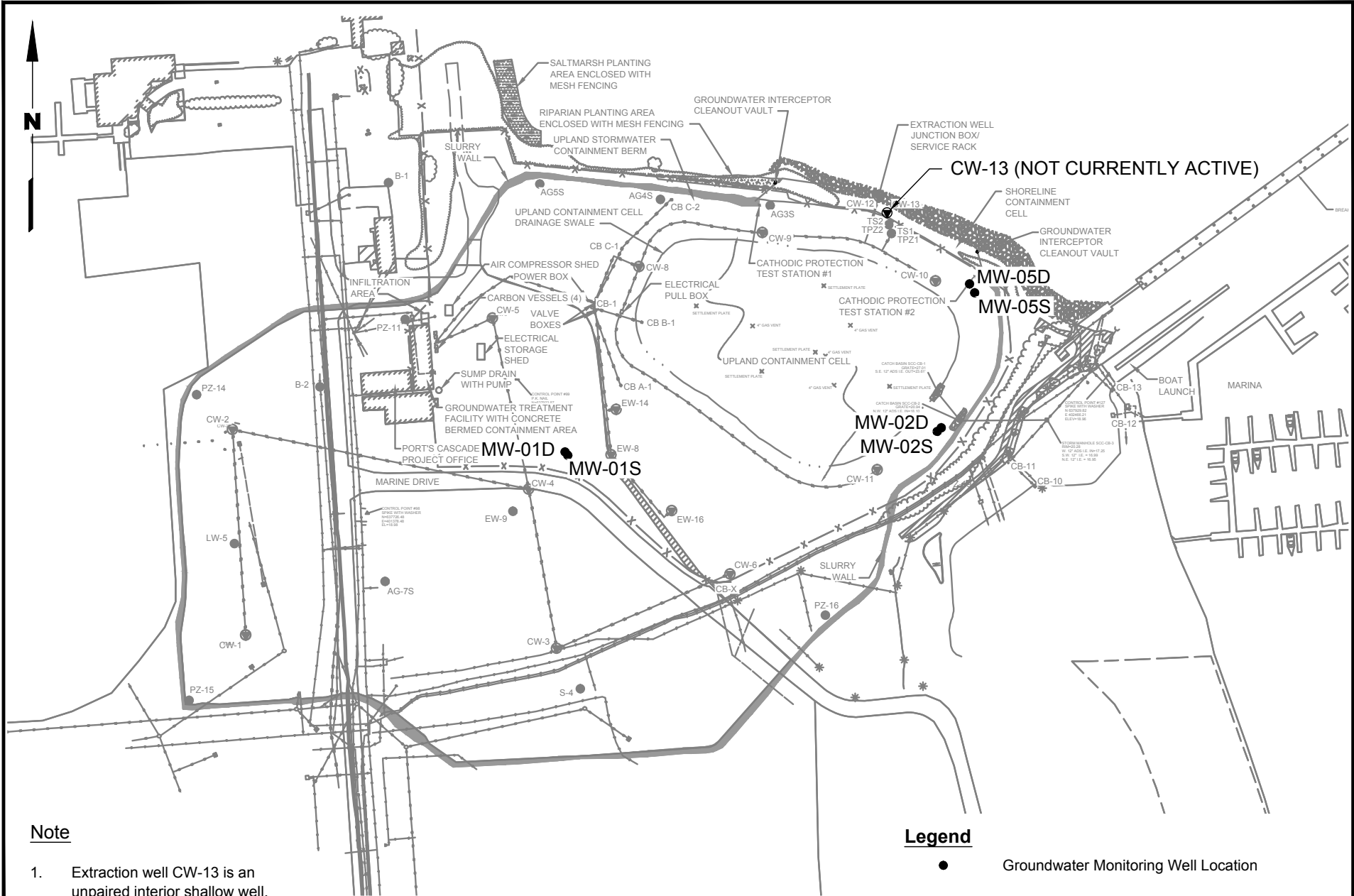
### Attachments

- Figure 1 Paired Shallow Groundwater Monitoring Network Well Locations
- Figure 2 Deep and Shallow Groundwater Monitoring Well Pairs
- Table 1 Groundwater Elevations
- Table 2 Summary of Current Analytical Results
- Attachment 1 Laboratory Data



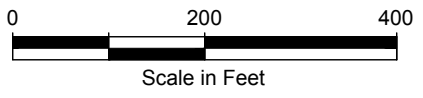
Port of Olympia Olympia, Washington	<b>Paired Shallow Groundwater Monitoring Network Well Locations</b>	Figure <b>1</b>
--	---	--------------------





**Note**

1. Extraction well CW-13 is an unpaired interior shallow well.



<p>Port of Olympia Olympia, Washington</p>	<p><b>Deep and Shallow Groundwater Monitoring Well Pairs</b></p>	<p>Figure <b>2</b></p>
--	--	----------------------------

**Table 1**  
**Groundwater Elevations**  
**Cascade Pole Site**  
**Port of Olympia, Washington**

Collection Date	Well ID	Depth to Groundwater (ft) (a)	Top of Well Casing Elevation (MLLW)	Groundwater Elevation (MLLW) (a)	Maximum Elevation Goal (b)	Goal Exceeded?
10/11/2017	PZ-13	7.32	19.50	12.18	--	
10/11/2017	PZ-12	5.04	19.00	13.96	15.50	No
10/11/2017	PZ-17	7.04	20.48	13.44	--	
10/11/2017	LW-3	5.55	19.83	14.28	15.50	No
10/11/2017	PZ-18	6.89	21.20	14.31	--	
10/11/2017	LW-4R	6.06	22.02	15.96	15.50	Yes
10/11/2017	PZ-19	14.91	23.67	8.76	--	
10/11/2017	MW-02S	16.64	31.96	15.32	15.50	No
10/11/2017	MW-02S	16.64	31.96	15.32	15.50	No
10/11/2017	MW-02D	17.53	31.81	14.28	--	
10/11/2017	MW-01S	6.93	21.64	14.71	--	
10/11/2017	MW-01D	8.11	21.72	13.61	--	
10/11/2017	MW-05S	13.89	29.45	15.56	16.50	No
10/11/2017	MW-05D	11.11	26.50	15.39	--	

Abbreviations and Acronyms:

ft = feet

ID = identification

MLLW = mean lower low water

-- = not measured

Notes:

(a) Below top of PVC well casing.

(b) Short-term hydraulic control goal is 15.5 feet along the majority of the cutoff wall alignment and 16.5 feet adjacent to Budd Inlet.

**Table 2**  
**Summary of Current Analytical Results**  
**Groundwater Compliance Monitoring**  
**Cascade Pole Site**  
**Port of Olympia, Washington**

	Cleanup Screening Levels (a)	PZ-12 17J0190-16 10/12/2017	PZ-13 17J0190-06 10/12/2017	PZ-17 17J0190-07 10/11/2017	PZ-18 17J0190-08 10/11/2017	PZ-19 17J0190-09 10/12/2017	LW-3 17J0190-10 10/11/2017	LW-4R 17J0190-11 10/11/2017
<b>POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)</b>								
<b>EPA Method SW8270D / SW8270D-SIM</b>								
Naphthalene	4900	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	<b>2.1</b>	<b>4.2</b>
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthene		1.0 U	1.0 U	<b>1.5</b>	1.0 U	1.0 U	1.0 U	1.0 U
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10 U	10.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	<b>1.4</b>	1.0 U	1.0 U	<b>1.2</b>	1.0 U
Total Benzofluoranthenes		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.076	0.076	0.076
<b>PENTACHLOROPHENOL (µg/L)</b>								
<b>EPA Method SW8041A/SW8270C,D</b>								
Pentachlorophenol	3	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
<b>PETROLEUM HYDROCARBONS</b>								
<b>Method NWTPH-Gx (µg/L)</b>								
Gasoline	1,000	100 U	100 U	100 U	100 U	100 U	<b>165</b>	100 U
<b>Method NWTPH-Dx (µg/L)</b>								
Diesel	500	100 U	100 U	100 U	100 U	100 U	<b>209</b>	100 U
Motor Oil	500	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Creosote Oil	500	200 U	200 U	200 U	200 U	200 U	<b>654</b>	200 U

**Table 2  
Summary of Current Analytical Results  
Groundwater Compliance Monitoring  
Cascade Pole Site  
Port of Olympia, Washington**

	Cleanup Screening Levels (a)	MW-01S 17J0190-12 10/12/2017	MW-02S 17J0190-13 10/11/2017	MW-05S 17J0190-14 10/11/2017	Dup of MW-05S PZ-30 17J0190-15 10/11/2017	MW-01D 17J0190-03 10/12/2017	MW-02D 17J0190-04 10/11/2017	MW-05D 17J0190-05 10/11/2017
<b>POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)</b>								
<b>EPA Method SW8270D / SW8270D-SIM</b>								
Naphthalene	4900	<b>5,080</b>	<b>2.8</b>	<b>9.7</b>	<b>10.6</b>	1.0 U	<b>75.0</b>	<b>3.1</b>
2-Methylnaphthalene		<b>618</b>	1.0 U	1.0 U	1.0 U	1.0 U	<b>11.0</b>	1.0 U
Acenaphthylene		<b>7.8</b>	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthene		<b>255</b>	<b>1.9</b>	<b>9.1</b>	<b>9.1</b>	1.0 U	<b>17.2</b>	<b>7.0</b>
Dibenzofuran		<b>76.0</b>	1.0 U	1.0 U	1.0 U	1.0 U	<b>5.2</b>	1.0 U
Fluorene		<b>75.6</b>	1.0 U	1.0 U	1.0 U	1.0 U	<b>5.4</b>	<b>1.9</b>
Pentachlorophenol	3	<b>5,510</b>	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
Phenanthrene		<b>69.3</b>	1.0 U	1.0 U	1.0 U	1.0 U	<b>4.4</b>	1.0 U
Anthracene		<b>14.5</b>	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene		<b>16.7</b>	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	2600	<b>7.9</b>	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		<b>1.33</b>	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		<b>1.26</b>	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		<b>0.44</b>	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		<b>0.12</b>	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		<b>418</b>	1.0 U	1.0 U	1.0 U	1.0 U	<b>12.7</b>	<b>1.2</b>
Total Benzofluoranthenes		<b>1.03</b>	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cPAH TEQ (b)	0.1 (c)	<b>0.70</b>	ND	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	<b>0.71</b>	0.076	0.076	0.076	0.076	0.076	0.076
<b>PENTACHLOROPHENOL (µg/L)</b>								
<b>EPA Method SW8041A/SW8270C,D</b>								
Pentachlorophenol	3	NA	<b>0.36</b>	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
<b>PETROLEUM HYDROCARBONS</b>								
<b>Method NWTPH-Gx (µg/L)</b>								
Gasoline	1,000	<b>33,900</b>	100 U	100 U	100 U	100 U	<b>188</b>	100 U
<b>Method NWTPH-Dx (µg/L)</b>								
Diesel	500	<b>10,300</b>	100 U	100 U	100 U	100 U	100 U	100 U
Motor Oil	500	<b>774</b>	200 U	200 U	200 U	200 U	200 U	200 U
Creosote Oil	500	<b>40,300</b>	200 U	200 U	200 U	200 U	<b>299</b>	200 U



**Table 2  
Summary of Current Analytical Results  
Groundwater Compliance Monitoring  
Cascade Pole Site  
Port of Olympia, Washington**

	Cleanup Screening Levels (a)	CW-13 17J0190-02 10/11/2017
<b>POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)</b>		
<b>EPA Method SW8270D / SW8270D-SIM</b>		
Naphthalene	4900	1.0 U
2-Methylnaphthalene		1.0 U
Acenaphthylene		1.0 U
Acenaphthene		1.0 U
Dibenzofuran		1.0 U
Fluorene		1.0 U
Pentachlorophenol	3	10.0 U
Phenanthrene		1.0 U
Anthracene		1.0 U
Fluoranthene		1.0 U
Pyrene	2600	1.0 U
Benzo(a)Anthracene		0.10 U
Chrysene		0.10 U
Benzo(a)Pyrene		0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U
Dibenz(a,h)Anthracene		0.10 U
Benzo(g,h,i)Perylene		1.0 U
1-Methylnaphthalene		1.0 U
Total Benzofluoranthenes		0.20 U
cPAH TEQ (b)	0.1 (c)	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076
<b>PENTACHLOROPHENOL (µg/L)</b>		
<b>EPA Method SW8041A/SW8270C,D</b>		
Pentachlorophenol	3	0.25 U
<b>PETROLEUM HYDROCARBONS</b>		
<b>Method NWTPH-Gx (µg/L)</b>		
Gasoline	1,000	100 U
<b>Method NWTPH-Dx (µg/L)</b>		
Diesel	500	100 U
Motor Oil	500	200 U
Creosote Oil	500	200 U

cPAH = carcinogenic polycyclic aromatic hydrocarbon  
µg/L = micrograms per liter  
EPA = US Environmental Protection Agency  
MTCA = Model Toxics Control Act  
NA = not analyzed  
ND = Not Detected.  
NWTPH-Dx = total petroleum hydrocarbons diesel range  
NWTPH-Gx = TPH gasoline range  
PCP = pentachlorophenol  
RL = reporting limit  
SIM = select ion monitoring  
WAC = Washington Administrative Code

U = Indicates the compound was undetected at the given reporting limit.  
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.  
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.  
Bold indicates detected compound. Box indicates exceedance of screening levels.  
Box indicates exceedance of screening level.

(a) Groundwater screening levels are MTCA Method B for marine surface water for cPAHs and PCP; MTCA Method A for TPH-Gx/TPH-Dx.  
(b) Toxicity equivalency factor (TEQ) as described in WAC 173-340-708 (8).  
(c) cPAH cleanup screening levels based on practical quantitation limit (PQL) for individual cPAHs.

ATTACHMENT 1

---

# Laboratory Report



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

30 October 2017

Christine Kimmel  
Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds, WA 98020

RE: Cascade Pole

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)

17J0190

Associated SDG ID(s)

N/A

**Kelly Bottem**

Digitally signed by Kelly Bottem  
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Client Services, cn=Kelly Bottem, email=kellyb@arilabs.com  
Date: 2017.10.30 14:52:06 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*





- Seattle/Edmonds (425) 778-0907
- Tacoma (253) 926-2493
- Spokane (509) 327-9737
- Portland (503) 542-1080
- \_\_\_\_\_

# Chain-of-Custody Record

Date 10/12/2017  
Page 1 of 1

Project Name <u>Part of Olympia</u> Project No. <u>0021041.010.011</u>					Testing Parameters					Turnaround Time <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Accelerated <input type="checkbox"/> _____		
Project Location/Event <u>Cascade Pole, Dry Season</u>					<i>NWTPH-GX NWTPH-DX + Cresosote PAHs CPAHs SIM PCP (8270) PCP (8041)</i>							
Sampler's Name <u>K. Gauglitz; J. Sloan</u>												
Project Contact <u>Chris Kimmel</u>												
Send Results To <u>Chris Kimmel, Don Bachle, Dani Jorgensen</u>												
Sample I.D.	Date	Time	Matrix	No. of Containers						Observations/Comments		
<u>Trip Blank - 20171011</u>	<u>---</u>	<u>---</u>	<u>H2O</u>	<u>2</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>X</u> Allow water samples to settle, collect aliquot from clear portion
<u>CW-13-20171011</u>	<u>10/11/17</u>	<u>1330</u>		<u>10</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>X</u> NWTPH-Dx - run acid wash silica gel cleanup
<u>MW-010-20171012</u>	<u>10/12/17</u>	<u>1145</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-020-20171011</u>	<u>10/11/17</u>	<u>1545</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-050-20171011</u>	<u>10/11/17</u>	<u>1445</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>PZ-13-20171012</u>	<u>10/12/17</u>	<u>940</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>PZ-17-20171011</u>	<u>10/11/17</u>	<u>17:10</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>PZ-18-20171011</u>	<u>10/11/17</u>	<u>18:00</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>PZ-19-20171012</u>	<u>10/12/17</u>	<u>10:40</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>LW-3-20171011</u>	<u>10/11/17</u>	<u>1720</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>LW-4R-20171011</u>	<u>10/11/17</u>	<u>1815</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-015-20171012</u>	<u>10/12/17</u>	<u>1148</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-025-20171011</u>	<u>10/11/17</u>	<u>1505</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-055-20171011</u>	<u>10/11/17</u>	<u>1315</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>PZ-30-20171011</u>	<u>10/11/17</u>	<u>1320</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>PZ-12-20171012</u>	<u>10/12/17</u>	<u>925</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Special Shipment/Handling or Storage Requirements 8 coolers w/ ice; VOAs are not preserved Method of Shipment drop-off

<b>Relinquished by</b> Signature <u>Katie M. Gauglitz</u> Printed Name <u>Katie Gauglitz</u> Company <u>LAI</u> Date <u>10/12/2017</u> Time <u>13:45</u>	<b>Received by</b> Signature <u>Stephanie Fisher</u> Printed Name <u>Stephanie Fisher</u> Company <u>ARI</u> Date <u>10/12/17</u> Time <u>1345</u>	<b>Relinquished by</b> Signature _____ Printed Name _____ Company _____ Date _____ Time _____	<b>Received by</b> Signature _____ Printed Name _____ Company _____ Date _____ Time _____
--	--	---	---



# Cooler Receipt Form

ARI Client: Landau

Project Name: Port of Olympia

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: 17J0190

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES  NO

Were custody papers included with the cooler? ..... YES  NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 1.2

Time: 1345

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D002565

Cooler Accepted by: SF Date: 10/12/17 Time: 1345

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES  NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA  YES  NO

Were all bottles sealed in individual plastic bags? ..... YES  NO

Did all bottles arrive in good condition (unbroken)? ..... YES  NO

Were all bottle labels complete and legible? ..... YES  NO

Did the number of containers listed on COC match with the number of containers received? ..... YES  NO

Did all bottle labels and tags agree with custody papers? ..... YES  NO

Were all bottles used correct for the requested analyses? ..... YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES  NO

Were all VOC vials free of air bubbles? ..... NA YES  NO

Was sufficient amount of sample sent in each bottle? ..... YES  NO

Date VOC Trip Blank was made at ARI ..... NA

Was Sample Split by ARI : NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

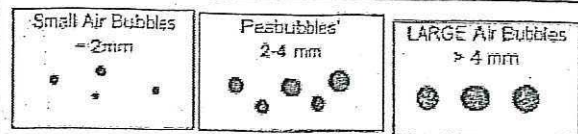
Samples Logged by: SF Date: 10/12/17 Time: 1726

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

*Additional Notes, Discrepancies, & Resolutions:*

By: \_\_\_\_\_ Date: \_\_\_\_\_



Small → "sm" (< 2 mm)  
Peabubbles → "pb" (2 to < 4 mm)  
Large → "lg" (4 to < 6 mm)  
Headspace → "hs" (> 6 mm)



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Trip Blank-20171011	17J0190-01	Water	11-Oct-2017 00:00	12-Oct-2017 13:45
CW-13-20171011	17J0190-02	Water	11-Oct-2017 13:30	12-Oct-2017 13:45
MW-01D-20171012	17J0190-03	Water	12-Oct-2017 11:45	12-Oct-2017 13:45
MW-02D-20171011	17J0190-04	Water	11-Oct-2017 15:45	12-Oct-2017 13:45
MW-05D-20171011	17J0190-05	Water	11-Oct-2017 14:45	12-Oct-2017 13:45
PZ-13-20171012	17J0190-06	Water	12-Oct-2017 09:40	12-Oct-2017 13:45
PZ-17-20171011	17J0190-07	Water	11-Oct-2017 17:10	12-Oct-2017 13:45
PZ-18-20171011	17J0190-08	Water	11-Oct-2017 18:00	12-Oct-2017 13:45
PZ-19-20171012	17J0190-09	Water	12-Oct-2017 10:40	12-Oct-2017 13:45
LW-3-20171011	17J0190-10	Water	11-Oct-2017 17:20	12-Oct-2017 13:45
LW-4R-20171011	17J0190-11	Water	11-Oct-2017 18:15	12-Oct-2017 13:45
MW-01S-20171012	17J0190-12	Water	12-Oct-2017 11:48	12-Oct-2017 13:45
MW-02S-20171011	17J0190-13	Water	11-Oct-2017 15:05	12-Oct-2017 13:45
MW-05S-20171011	17J0190-14	Water	11-Oct-2017 13:15	12-Oct-2017 13:45
PZ-30-20171011	17J0190-15	Water	11-Oct-2017 13:20	12-Oct-2017 13:45
PZ-12-20171012	17J0190-16	Water	12-Oct-2017 09:25	12-Oct-2017 13:45



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

## Case Narrative

### **Chlorinated Phenols - EPA Method SW8041A**

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/ LCSD and RPD recoveries were within control limits.

Per the COC instructions, samples were allowed to settle and sample volumes were collected from the clear portion.

### **Semivolatiles - EPA Method SW8270D**

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of Pentachlorophenol which was out of control high in the associated CCAL. All associated samples which contain analyte have been flagged with a "Q" qualifier for the 10/20/17 analysis.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/ LCSD and RPD recoveries were within control limits.

Per the COC instructions, samples were allowed to settle and sample volumes were collected from the clear portion.

### **Polynuclear Aromatic Hydrocarbons (cPAH only) - EPA Method SW8270D-SIM**

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/ LCSD and RPD recoveries were within control limits.

Per the COC instructions, samples were allowed to settle and sample volumes were collected from the clear portion.

**Gasoline Range Organics - WA-Ecology Method NW-TPHG**

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/ LCSD and RPD recoveries were within control limits.

**Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx (Ac/Si cleaned)**

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/ LCSD and RPD recoveries were within control limits.

Per the COC instructions, samples were allowed to settle and sample volumes were collected from the clear portion.





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**Trip Blank-20171011**  
**17J0190-01 (Water)**

**Volatile Organic Compounds**

Method: NWTPhg  
Instrument: NT2

Sampled: 10/11/2017 00:00  
Analyzed: 13-Oct-2017 11:44

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	97.5	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**CW-13-20171011**  
**17J0190-02 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 13:30  
Analyzed: 13-Oct-2017 12:04

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	98.4	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**CW-13-20171011**  
**17J0190-02 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 13:30  
Analyzed: 20-Oct-2017 02:30

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	81.6	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	96.3	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	91.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**CW-13-20171011**  
**17J0190-02 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 13:30  
Analyzed: 19-Oct-2017 19:19

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	60.4	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	98.9	%	



Landau Associates, Inc. 130 2nd Avenue S. Edmonds WA, 98020	Project: Cascade Pole Project Number: 0021041.010.011 Project Manager: Christine Kimmel	Reported: 30-Oct-2017 14:42
---	---	--------------------------------

**CW-13-20171011**  
**17J0190-02 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 13:30  
Analyzed: 20-Oct-2017 23:28

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BFJ0359 Prepared: 13-Oct-2017	Sample Size: 500 mL Final Volume: 1 mL
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CFJ0129 Cleaned: 20-Oct-2017	Initial Volume: 1 mL Final Volume: 1 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CFJ0128 Cleaned: 20-Oct-2017	Initial Volume: 1 mL Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	103	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**CW-13-20171011**  
**17J0190-02 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 13:30  
Analyzed: 24-Oct-2017 17:29

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	45.5	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	51.1	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01D-20171012**  
**17J0190-03 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/12/2017 11:45  
Analyzed: 13-Oct-2017 12:25

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	96.6	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01D-20171012**  
**17J0190-03 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 11:45  
Analyzed: 19-Oct-2017 18:47

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364  
Prepared: 14-Oct-2017

Sample Size: 500 mL  
Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	71.1	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	81.6	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	83.1	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01D-20171012**  
**17J0190-03 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/12/2017 11:45  
Analyzed: 19-Oct-2017 19:46

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	54.5	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	74.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01D-20171012**  
**17J0190-03 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/12/2017 11:45  
Analyzed: 20-Oct-2017 23:49

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	110	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01D-20171012**  
**17J0190-03 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/12/2017 11:45  
Analyzed: 24-Oct-2017 17:47

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	45.3	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	51.6	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

**Reported:**  
30-Oct-2017 14:42

**MW-02D-20171011**  
**17J0190-04 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 15:45  
Analyzed: 13-Oct-2017 12:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	<b>188</b>	ug/L	
HC ID: GRO						
Surrogate: Toluene-d8			80-120 %	95.6	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	92.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02D-20171011**  
**17J0190-04 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 15:45  
Analyzed: 19-Oct-2017 19:20

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364  
Prepared: 14-Oct-2017

Sample Size: 500 mL  
Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	75.0	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	17.2	ug/L	
2-Methylnaphthalene	91-57-6	1	1.0	11.0	ug/L	
Dibenzofuran	132-64-9	1	1.0	5.2	ug/L	
Fluorene	86-73-7	1	1.0	5.4	ug/L	
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	4.4	ug/L	
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	5.3	ug/L	
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	12.7	ug/L	
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	79.0	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	91.7	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	89.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02D-20171011**  
**17J0190-04 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 15:45  
Analyzed: 19-Oct-2017 20:12

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			<i>31-120 %</i>	<i>64.2</i>	<i>%</i>	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			<i>10-125 %</i>	<i>110</i>	<i>%</i>	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02D-20171011**  
**17J0190-04 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 15:45  
Analyzed: 21-Oct-2017 00:13

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	299	ug/L	
HC ID: CREOSOTE						
Surrogate: <i>o</i> -Terphenyl			50-150 %	102	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02D-20171011**  
**17J0190-04 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 15:45  
Analyzed: 24-Oct-2017 18:05

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol			26-120 %	48.6	%	
Surrogate: 2,4,6-Tribromophenol [2C]			26-120 %	53.4	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05D-20171011**  
**17J0190-05 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 14:45  
Analyzed: 13-Oct-2017 13:05

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	95.8	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.3	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05D-20171011**  
**17J0190-05 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 14:45  
Analyzed: 19-Oct-2017 19:53

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364  
Prepared: 14-Oct-2017

Sample Size: 500 mL  
Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	3.1	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	7.0	ug/L	
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	1.9	ug/L	
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	3.0	ug/L	
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	1.2	ug/L	
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	75.2	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	89.5	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	87.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05D-20171011**  
**17J0190-05 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 14:45  
Analyzed: 19-Oct-2017 20:38

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			<i>31-120 %</i>	<i>47.7</i>	<i>%</i>	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			<i>10-125 %</i>	<i>90.0</i>	<i>%</i>	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05D-20171011**  
**17J0190-05 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 14:45  
Analyzed: 21-Oct-2017 00:34

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	91.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05D-20171011**  
**17J0190-05 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 14:45  
Analyzed: 24-Oct-2017 18:22

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	46.7	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	50.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-13-20171012**  
**17J0190-06 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/12/2017 09:40  
Analyzed: 13-Oct-2017 13:25

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	96.3	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	92.1	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-13-20171012**  
**17J0190-06 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 09:40  
Analyzed: 19-Oct-2017 20:26

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	80.2	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	90.1	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	91.3	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-13-20171012**  
**17J0190-06 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/12/2017 09:40  
Analyzed: 19-Oct-2017 21:05

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			<i>31-120 %</i>	<i>60.3</i>	<i>%</i>	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			<i>10-125 %</i>	<i>82.1</i>	<i>%</i>	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-13-20171012**  
**17J0190-06 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/12/2017 09:40  
Analyzed: 21-Oct-2017 00:58

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	102	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-13-20171012**  
**17J0190-06 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/12/2017 09:40  
Analyzed: 24-Oct-2017 18:58

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	48.6	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	52.6	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-17-20171011**  
**17J0190-07 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 17:10  
Analyzed: 13-Oct-2017 13:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	96.8	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.2	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-17-20171011**  
**17J0190-07 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 17:10  
Analyzed: 19-Oct-2017 20:59

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	1.5	ug/L	
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	1.4	ug/L	
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	82.0	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	101	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	91.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-17-20171011**  
**17J0190-07 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 17:10  
Analyzed: 19-Oct-2017 21:31

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			<i>31-120 %</i>	<i>61.8</i>	<i>%</i>	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			<i>10-125 %</i>	<i>54.5</i>	<i>%</i>	



Landau Associates, Inc. 130 2nd Avenue S. Edmonds WA, 98020	Project: Cascade Pole Project Number: 0021041.010.011 Project Manager: Christine Kimmel	Reported: 30-Oct-2017 14:42
---	---	--------------------------------

**PZ-17-20171011**  
**17J0190-07 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 17:10  
Analyzed: 21-Oct-2017 01:19

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BFJ0359 Prepared: 13-Oct-2017	Sample Size: 500 mL Final Volume: 1 mL
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CFJ0129 Cleaned: 20-Oct-2017	Initial Volume: 1 mL Final Volume: 1 mL
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CFJ0128 Cleaned: 20-Oct-2017	Initial Volume: 1 mL Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	90.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-17-20171011**  
**17J0190-07 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 17:10  
Analyzed: 24-Oct-2017 19:16

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362  
Prepared: 17-Oct-2017

Sample Size: 500 mL  
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol			26-120 %	53.4	%	
Surrogate: 2,4,6-Tribromophenol [2C]			26-120 %	57.9	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-18-20171011**  
**17J0190-08 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 18:00  
Analyzed: 13-Oct-2017 14:06

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	96.6	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.7	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-18-20171011**  
**17J0190-08 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 18:00  
Analyzed: 19-Oct-2017 21:32

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	74.7	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	89.2	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	81.1	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-18-20171011**  
**17J0190-08 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 18:00  
Analyzed: 19-Oct-2017 21:57

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	57.5	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	79.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-18-20171011**  
**17J0190-08 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 18:00  
Analyzed: 21-Oct-2017 01:43

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	78.9	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-18-20171011**  
**17J0190-08 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 18:00  
Analyzed: 24-Oct-2017 19:34

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	56.1	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	60.9	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-19-20171012**  
**17J0190-09 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/12/2017 10:40  
Analyzed: 13-Oct-2017 14:26

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	96.4	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	93.2	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-19-20171012**  
**17J0190-09 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 10:40  
Analyzed: 19-Oct-2017 22:05

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	74.2	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	94.8	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	92.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-19-20171012**  
**17J0190-09 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/12/2017 10:40  
Analyzed: 19-Oct-2017 22:23

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	57.2	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	82.2	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-19-20171012**  
**17J0190-09 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/12/2017 10:40  
Analyzed: 21-Oct-2017 03:12

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	84.0	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-19-20171012**  
**17J0190-09 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/12/2017 10:40  
Analyzed: 24-Oct-2017 19:51

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol			26-120 %	45.5	%	
Surrogate: 2,4,6-Tribromophenol [2C]			26-120 %	50.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-3-20171011**  
**17J0190-10 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 17:20  
Analyzed: 13-Oct-2017 14:46

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	165	ug/L	
HC ID: GRO						
Surrogate: Toluene-d8			80-120 %	97.2	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	96.5	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-3-20171011**  
**17J0190-10 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 17:20  
Analyzed: 19-Oct-2017 22:38

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	2.1	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	1.2	ug/L	
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	84.1	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	102	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	85.2	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-3-20171011**  
**17J0190-10 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 17:20  
Analyzed: 19-Oct-2017 22:50

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	63.7	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	31.9	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-3-20171011**  
**17J0190-10 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 17:20  
Analyzed: 21-Oct-2017 03:36

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24) HC ID: DRO		1	100	209	ug/L	
Motor Oil Range Organics (C24-C38) HC ID: CREOSOTE		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22) HC ID: CREOSOTE	8001-58-9	1	200	654	ug/L	
Surrogate: o-Terphenyl			50-150 %	94.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-3-20171011**  
**17J0190-10 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 17:20  
Analyzed: 24-Oct-2017 20:09

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	63.1	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	67.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-4R-20171011**  
**17J0190-11 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 18:15  
Analyzed: 13-Oct-2017 15:07

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	96.2	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	93.3	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-4R-20171011**  
**17J0190-11 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 18:15  
Analyzed: 19-Oct-2017 23:11

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	4.2	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	78.1	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	91.6	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	86.1	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-4R-20171011**  
**17J0190-11 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 18:15  
Analyzed: 19-Oct-2017 23:16

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	56.7	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	84.5	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-4R-20171011**  
**17J0190-11 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 18:15  
Analyzed: 21-Oct-2017 03:57

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	96.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**LW-4R-20171011**  
**17J0190-11 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 18:15  
Analyzed: 24-Oct-2017 20:27

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol			26-120 %	47.0	%	
Surrogate: 2,4,6-Tribromophenol [2C]			26-120 %	49.9	%	



Landau Associates, Inc. 130 2nd Avenue S. Edmonds WA, 98020	Project: Cascade Pole Project Number: 0021041.010.011 Project Manager: Christine Kimmel	Reported: 30-Oct-2017 14:42
---	---	--------------------------------

**MW-01S-20171012**  
**17J0190-12 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/12/2017 11:48  
Analyzed: 13-Oct-2017 15:30

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 0.4 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	2500	<b>33900</b>	ug/L	
HC ID: GRO						
Surrogate: Toluene-d8			80-120 %	96.2	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	98.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01S-20171012**  
**17J0190-12 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 11:48  
Analyzed: 19-Oct-2017 23:44

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364  
Prepared: 14-Oct-2017

Sample Size: 500 mL  
Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	<b>4830</b>	ug/L	E
Acenaphthylene	208-96-8	1	1.0	<b>7.8</b>	ug/L	
Acenaphthene	83-32-9	1	1.0	<b>159</b>	ug/L	E
2-Methylnaphthalene	91-57-6	1	1.0	<b>167</b>	ug/L	E
Dibenzofuran	132-64-9	1	1.0	<b>76.0</b>	ug/L	
Fluorene	86-73-7	1	1.0	<b>95.0</b>	ug/L	E
Pentachlorophenol	87-86-5	1	10.0	<b>4540</b>	ug/L	E
Phenanthrene	85-01-8	1	1.0	<b>69.3</b>	ug/L	
Anthracene	120-12-7	1	1.0	<b>14.5</b>	ug/L	
Carbazole	86-74-8	1	1.0	<b>30.3</b>	ug/L	
Fluoranthene	206-44-0	1	1.0	<b>16.7</b>	ug/L	
Pyrene	129-00-0	1	1.0	<b>7.9</b>	ug/L	
Benzo(a)anthracene	56-55-3	1	1.0	<b>1.6</b>	ug/L	
Chrysene	218-01-9	1	1.0	<b>1.5</b>	ug/L	
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	<b>125</b>	ug/L	E
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	62.6	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	77.3	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	60.5	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01S-20171012**  
**17J0190-12 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/12/2017 11:48  
Analyzed: 19-Oct-2017 23:43

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	<b>1.33</b>	ug/L	
Chrysene	218-01-9	1	0.10	<b>1.26</b>	ug/L	
Benzo(a)fluoranthene, Total		1	0.20	<b>1.03</b>	ug/L	
Benzo(a)pyrene	50-32-8	1	0.10	<b>0.44</b>	ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	<b>0.12</b>	ug/L	
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			<i>31-120 %</i>	<i>43.7</i>	<i>%</i>	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			<i>10-125 %</i>	<i>51.6</i>	<i>%</i>	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01S-20171012**  
**17J0190-12 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/12/2017 11:48  
Analyzed: 21-Oct-2017 04:21

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24) HC ID: DRO		1	100	<b>8440</b>	ug/L	E
Motor Oil Range Organics (C24-C38) HC ID: RRO		1	200	<b>774</b>	ug/L	
Creosote Range Organics (C12-C22) HC ID: CREOSOTE	8001-58-9	1	200	<b>33200</b>	ug/L	E
Surrogate: <i>o</i> -Terphenyl			50-150 %	88.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01S-20171012**  
**17J0190-12RE1 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 11:48  
Analyzed: 20-Oct-2017 13:33

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	50	50.0	<b>5000</b>	ug/L	D, E
Acenaphthylene	208-96-8	50	50.0	ND	ug/L	U
Acenaphthene	83-32-9	50	50.0	<b>255</b>	ug/L	D
2-Methylnaphthalene	91-57-6	50	50.0	<b>618</b>	ug/L	D
Dibenzofuran	132-64-9	50	50.0	<b>97.8</b>	ug/L	D
Fluorene	86-73-7	50	50.0	<b>75.6</b>	ug/L	D
Pentachlorophenol	87-86-5	50	500	<b>5510</b>	ug/L	Q, D
Phenanthrene	85-01-8	50	50.0	<b>82.2</b>	ug/L	D
Anthracene	120-12-7	50	50.0	ND	ug/L	U
Carbazole	86-74-8	50	50.0	ND	ug/L	U
Fluoranthene	206-44-0	50	50.0	ND	ug/L	U
Pyrene	129-00-0	50	50.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	50	50.0	ND	ug/L	U
Chrysene	218-01-9	50	50.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	50	50.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	50	50.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	50	50.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	50	50.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	50	50.0	<b>418</b>	ug/L	D
<i>Surrogate: 2-Fluorobiphenyl</i>			<i>54.4-120 %</i>		<i>D1</i>	<i>D1, U</i>
<i>Surrogate: 2,4,6-Tribromophenol</i>			<i>49.3-128 %</i>		<i>D1</i>	<i>D1, U</i>
<i>Surrogate: p-Terphenyl-d14</i>			<i>60-120 %</i>		<i>D1</i>	<i>D1, U</i>





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01S-20171012**  
**17J0190-12RE1 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/12/2017 11:48  
Analyzed: 24-Oct-2017 13:50

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24) HC ID: DRO		10	1000	<b>10300</b>	ug/L	D
Motor Oil Range Organics (C24-C38)		10	2000	ND	ug/L	U
Creosote Range Organics (C12-C22) HC ID: CREOSOTE	8001-58-9	10	2000	<b>40300</b>	ug/L	D
Surrogate: o-Terphenyl			50-150 %	109	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-01S-20171012**  
**17J0190-12RE2 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 11:48  
Analyzed: 20-Oct-2017 14:12

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364  
Prepared: 14-Oct-2017

Sample Size: 500 mL  
Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	100	100	5080	ug/L	D
Acenaphthylene	208-96-8	100	100	ND	ug/L	U
Acenaphthene	83-32-9	100	100	270	ug/L	D
2-Methylnaphthalene	91-57-6	100	100	657	ug/L	D
Dibenzofuran	132-64-9	100	100	103	ug/L	D
Fluorene	86-73-7	100	100	ND	ug/L	U
Pentachlorophenol	87-86-5	100	1000	5880	ug/L	Q, D
Phenanthrene	85-01-8	100	100	ND	ug/L	U
Anthracene	120-12-7	100	100	ND	ug/L	U
Carbazole	86-74-8	100	100	ND	ug/L	U
Fluoranthene	206-44-0	100	100	ND	ug/L	U
Pyrene	129-00-0	100	100	ND	ug/L	U
Benzo(a)anthracene	56-55-3	100	100	ND	ug/L	U
Chrysene	218-01-9	100	100	ND	ug/L	U
Benzo(a)pyrene	50-32-8	100	100	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	100	100	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	100	100	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	100	100	ND	ug/L	U
1-Methylnaphthalene	90-12-0	100	100	442	ug/L	D
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %		DI	D1, U
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %		DI	D1, U
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %		DI	D1, U



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02S-20171011**  
**17J0190-13 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 15:05  
Analyzed: 13-Oct-2017 15:50

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	98.4	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02S-20171011**  
**17J0190-13 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 15:05  
Analyzed: 20-Oct-2017 00:17

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364  
Prepared: 14-Oct-2017

Sample Size: 500 mL  
Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	2.8	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	1.9	ug/L	
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	84.0	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	100	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	90.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02S-20171011**  
**17J0190-13 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 15:05  
Analyzed: 20-Oct-2017 00:09

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			<i>31-120 %</i>	<i>54.7</i>	<i>%</i>	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			<i>10-125 %</i>	<i>23.9</i>	<i>%</i>	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02S-20171011**  
**17J0190-13 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 15:05  
Analyzed: 21-Oct-2017 04:42

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	97.5	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-02S-20171011**  
**17J0190-13 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 15:05  
Analyzed: 27-Oct-2017 14:42

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	<b>0.36</b>	ug/L	
Surrogate: 2,4,6-Tribromophenol			26-120 %	52.7	%	
Surrogate: 2,4,6-Tribromophenol [2C]			26-120 %	57.2	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05S-20171011**  
**17J0190-14 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 13:15  
Analyzed: 13-Oct-2017 16:10

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	95.7	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	93.6	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05S-20171011**  
**17J0190-14 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 13:15  
Analyzed: 20-Oct-2017 00:50

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	9.7	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	9.1	ug/L	
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	77.9	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	95.4	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	85.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05S-20171011**  
**17J0190-14 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 13:15  
Analyzed: 20-Oct-2017 00:35

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	67.2	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	78.9	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05S-20171011**  
**17J0190-14 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 13:15  
Analyzed: 21-Oct-2017 05:06

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	82.6	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**MW-05S-20171011**  
**17J0190-14 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 13:15  
Analyzed: 24-Oct-2017 20:45

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
Surrogate: 2,4,6-Tribromophenol			26-120 %	53.5	%	
Surrogate: 2,4,6-Tribromophenol [2C]			26-120 %	53.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-30-20171011**  
**17J0190-15 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/11/2017 13:20  
Analyzed: 13-Oct-2017 16:30

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	97.7	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-30-20171011**  
**17J0190-15 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/11/2017 13:20  
Analyzed: 20-Oct-2017 01:23

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	<b>10.6</b>	ug/L	
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	<b>9.1</b>	ug/L	
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	76.0	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	93.8	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	87.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-30-20171011**  
**17J0190-15 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/11/2017 13:20  
Analyzed: 20-Oct-2017 01:02

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	61.2	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	73.4	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-30-20171011**  
**17J0190-15 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/11/2017 13:20  
Analyzed: 21-Oct-2017 05:27

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	93.3	%	





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-30-20171011**  
**17J0190-15 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/11/2017 13:20  
Analyzed: 24-Oct-2017 21:03

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	56.2	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	60.6	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-12-20171012**  
**17J0190-16 (Water)**

**Volatile Organic Compounds**

Method: NWTPHg  
Instrument: NT2

Sampled: 10/12/2017 09:25  
Analyzed: 13-Oct-2017 16:50

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BFJ0361 Sample Size: 10 mL  
Prepared: 13-Oct-2017 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)		1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	97.3	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	93.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-12-20171012**  
**17J0190-16 (Water)**

**Semivolatile Organic Compounds**

Method: EPA 8270D  
Instrument: NT6

Sampled: 10/12/2017 09:25  
Analyzed: 20-Oct-2017 01:57

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0364 Sample Size: 500 mL  
Prepared: 14-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	1.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	1.0	ND	ug/L	U
Pentachlorophenol	87-86-5	1	10.0	ND	ug/L	U
Phenanthrene	85-01-8	1	1.0	ND	ug/L	U
Anthracene	120-12-7	1	1.0	ND	ug/L	U
Carbazole	86-74-8	1	1.0	ND	ug/L	U
Fluoranthene	206-44-0	1	1.0	ND	ug/L	U
Pyrene	129-00-0	1	1.0	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	1.0	ND	ug/L	U
Chrysene	218-01-9	1	1.0	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	1.0	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	1.0	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	1.0	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	1.0	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	1.0	ND	ug/L	U
<i>Surrogate: 2-Fluorobiphenyl</i>			54.4-120 %	72.0	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>			49.3-128 %	90.0	%	
<i>Surrogate: p-Terphenyl-d14</i>			60-120 %	83.6	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-12-20171012**  
**17J0190-16 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270D-SIM  
Instrument: NT8

Sampled: 10/12/2017 09:25  
Analyzed: 20-Oct-2017 01:28

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)  
Preparation Batch: BFJ0365 Sample Size: 500 mL  
Prepared: 16-Oct-2017 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Benzo(a)anthracene	56-55-3	1	0.10	ND	ug/L	U
Chrysene	218-01-9	1	0.10	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.20	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.10	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.10	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.10	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>			31-120 %	57.1	%	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>			10-125 %	86.7	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-12-20171012**  
**17J0190-16 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx  
Instrument: FID4

Sampled: 10/12/2017 09:25  
Analyzed: 21-Oct-2017 05:51

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0359 Sample Size: 500 mL  
Prepared: 13-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CFJ0129 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid  
Cleanup Batch: CFJ0128 Initial Volume: 1 mL  
Cleaned: 20-Oct-2017 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	100	ND	ug/L	U
Motor Oil Range Organics (C24-C38)		1	200	ND	ug/L	U
Creosote Range Organics (C12-C22)	8001-58-9	1	200	ND	ug/L	U
Surrogate: <i>o</i> -Terphenyl			50-150 %	96.8	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**PZ-12-20171012**  
**17J0190-16 (Water)**

**Phenols**

Method: EPA 8041A  
Instrument: ECD8

Sampled: 10/12/2017 09:25  
Analyzed: 24-Oct-2017 21:21

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BFJ0362 Sample Size: 500 mL  
Prepared: 17-Oct-2017 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.25	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>			26-120 %	48.6	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>			26-120 %	53.0	%	



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**Volatile Organic Compounds - Quality Control**

**Batch BFJ0361 - EPA 5030 (Purge and Trap)**

Instrument: NT2 Analyst: PC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BFJ0361-BLK1)</b>										
					Prepared: 13-Oct-2017 Analyzed: 13-Oct-2017 11:24					
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8		4.78	ug/L	5.00		95.7	80-120			
Surrogate: 4-Bromofluorobenzene		4.68	ug/L	5.00		93.6	80-120			
<b>LCS (BFJ0361-BS1)</b>										
					Prepared: 13-Oct-2017 Analyzed: 13-Oct-2017 10:03					
Gasoline Range Organics (Tol-Nap)	1120	100	ug/L	1000		112	72-128			
Surrogate: Toluene-d8		4.84	ug/L	5.00		96.9	80-120			
Surrogate: 4-Bromofluorobenzene		4.65	ug/L	5.00		93.0	80-120			
<b>LCS Dup (BFJ0361-BSD1)</b>										
					Prepared: 13-Oct-2017 Analyzed: 13-Oct-2017 10:23					
Gasoline Range Organics (Tol-Nap)	1130	100	ug/L	1000		113	72-128	1.03	30	
Surrogate: Toluene-d8		4.83	ug/L	5.00		96.5	80-120			
Surrogate: 4-Bromofluorobenzene		4.80	ug/L	5.00		96.0	80-120			



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

Semivolatile Organic Compounds - Quality Control

Batch BFJ0364 - EPA 3510C SepF

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BFJ0364-BLK1)</b>										
Prepared: 14-Oct-2017 Analyzed: 19-Oct-2017 16:34										
Naphthalene	ND	1.0	ug/L							U
Acenaphthylene	ND	1.0	ug/L							U
Acenaphthene	ND	1.0	ug/L							U
2-Methylnaphthalene	ND	1.0	ug/L							U
Dibenzofuran	ND	1.0	ug/L							U
Fluorene	ND	1.0	ug/L							U
Pentachlorophenol	ND	10.0	ug/L							U
Phenanthrene	ND	1.0	ug/L							U
Anthracene	ND	1.0	ug/L							U
Carbazole	ND	1.0	ug/L							U
Fluoranthene	ND	1.0	ug/L							U
Pyrene	ND	1.0	ug/L							U
Benzo(a)anthracene	ND	1.0	ug/L							U
Chrysene	ND	1.0	ug/L							U
Benzo(a)pyrene	ND	1.0	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	1.0	ug/L							U
Dibenzo(a,h)anthracene	ND	1.0	ug/L							U
Benzo(g,h,i)perylene	ND	1.0	ug/L							U
1-Methylnaphthalene	ND	1.0	ug/L							U
<i>Surrogate: 2-Fluorobiphenyl</i>		20.3	ug/L	25.0		81.1	54.4-120			
<i>Surrogate: 2,4,6-Tribromophenol</i>		34.3	ug/L	37.5		91.6	49.3-128			
<i>Surrogate: p-Terphenyl-d14</i>		23.4	ug/L	25.0		93.8	60-120			

<b>LCS (BFJ0364-BS1)</b>										
Prepared: 14-Oct-2017 Analyzed: 19-Oct-2017 17:08										
Naphthalene	18.3	1.0	ug/L	25.0		73.2	51.9-120			
Acenaphthylene	20.1	1.0	ug/L	25.0		80.5	56.5-120			
Acenaphthene	22.0	1.0	ug/L	25.0		87.8	60.9-120			
2-Methylnaphthalene	18.3	1.0	ug/L	25.0		73.2	56.5-120			
Dibenzofuran	20.9	1.0	ug/L	25.0		83.5	61.9-120			
Fluorene	22.1	1.0	ug/L	25.0		88.3	62.3-120			
Pentachlorophenol	73.9	10.0	ug/L	75.0		98.6	40.7-124			
Phenanthrene	22.1	1.0	ug/L	25.0		88.4	61-120			
Anthracene	20.5	1.0	ug/L	25.0		81.8	64.6-120			
Carbazole	21.4	1.0	ug/L	25.0		85.5	64.6-120			
Fluoranthene	22.9	1.0	ug/L	25.0		91.4	67.9-120			





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

Semivolatile Organic Compounds - Quality Control

Batch BFJ0364 - EPA 3510C SepF

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BFJ0364-BS1)</b>										
					Prepared: 14-Oct-2017 Analyzed: 19-Oct-2017 17:08					
Pyrene	22.9	1.0	ug/L	25.0		91.4	66.4-120			
Benzo(a)anthracene	21.6	1.0	ug/L	25.0		86.3	65.9-120			
Chrysene	22.5	1.0	ug/L	25.0		90.0	61.5-120			
Benzo(a)pyrene	23.9	1.0	ug/L	25.0		95.7	74-121			
Indeno(1,2,3-cd)pyrene	23.6	1.0	ug/L	25.0		94.4	55.6-120			
Dibenzo(a,h)anthracene	24.8	1.0	ug/L	25.0		99.2	55-120			
Benzo(g,h,i)perylene	23.4	1.0	ug/L	25.0		93.4	49.4-120			
1-Methylnaphthalene	20.7	1.0	ug/L	25.0		82.6	54.4-120			
<i>Surrogate: 2-Fluorobiphenyl</i>		21.6	ug/L	25.0		86.3	54.4-120			
<i>Surrogate: 2,4,6-Tribromophenol</i>		39.3	ug/L	37.5		105	49.3-128			
<i>Surrogate: p-Terphenyl-d14</i>		24.0	ug/L	25.0		95.9	60-120			

<b>LCS Dup (BFJ0364-BSD1)</b>										
					Prepared: 14-Oct-2017 Analyzed: 19-Oct-2017 17:41					
Naphthalene	19.6	1.0	ug/L	25.0		78.3	51.9-120	6.76	30	
Acenaphthylene	21.0	1.0	ug/L	25.0		83.9	56.5-120	4.11	30	
Acenaphthene	22.6	1.0	ug/L	25.0		90.4	60.9-120	2.88	30	
2-Methylnaphthalene	19.3	1.0	ug/L	25.0		77.0	56.5-120	5.14	30	
Dibenzofuran	21.6	1.0	ug/L	25.0		86.5	61.9-120	3.52	30	
Fluorene	22.7	1.0	ug/L	25.0		91.0	62.3-120	2.97	30	
Pentachlorophenol	77.2	10.0	ug/L	75.0		103	40.7-124	4.34	30	
Phenanthrene	22.9	1.0	ug/L	25.0		91.4	61-120	3.34	30	
Anthracene	21.1	1.0	ug/L	25.0		84.4	64.6-120	3.14	30	
Carbazole	21.9	1.0	ug/L	25.0		87.7	64.6-120	2.45	30	
Fluoranthene	23.9	1.0	ug/L	25.0		95.5	67.9-120	4.37	30	
Pyrene	23.6	1.0	ug/L	25.0		94.4	66.4-120	3.20	30	
Benzo(a)anthracene	22.9	1.0	ug/L	25.0		91.8	65.9-120	6.13	30	
Chrysene	23.2	1.0	ug/L	25.0		92.7	61.5-120	2.93	30	
Benzo(a)pyrene	24.8	1.0	ug/L	25.0		99.0	74-121	3.48	30	
Indeno(1,2,3-cd)pyrene	24.6	1.0	ug/L	25.0		98.2	55.6-120	3.97	30	
Dibenzo(a,h)anthracene	25.6	1.0	ug/L	25.0		102	55-120	3.20	30	
Benzo(g,h,i)perylene	24.1	1.0	ug/L	25.0		96.6	49.4-120	3.31	30	
1-Methylnaphthalene	21.4	1.0	ug/L	25.0		85.5	54.4-120	3.42	30	
<i>Surrogate: 2-Fluorobiphenyl</i>		22.2	ug/L	25.0		88.9	54.4-120			
<i>Surrogate: 2,4,6-Tribromophenol</i>		39.2	ug/L	37.5		105	49.3-128			



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

**Reported:**  
30-Oct-2017 14:42

**Semivolatile Organic Compounds - Quality Control**

**Batch BFJ0364 - EPA 3510C SepF**

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BFJ0364-BSD1)</b>					Prepared: 14-Oct-2017 Analyzed: 19-Oct-2017 17:41					
<i>Surrogate: p-Terphenyl-d14</i>	24.5		ug/L	25.0		98.1	60-120			



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

Semivolatile Organic Compounds - SIM - Quality Control

Batch BFJ0365 - EPA 3520C (Liq Liq)

Instrument: NT8 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BFJ0365-BLK1)</b>										
Prepared: 16-Oct-2017 Analyzed: 19-Oct-2017 18:00										
Benzo(a)anthracene	ND	0.10	ug/L							U
Chrysene	ND	0.10	ug/L							U
Benzo(a)fluoranthene, Total	ND	0.20	ug/L							U
Benzo(a)pyrene	ND	0.10	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L							U
Dibenzo(a,h)anthracene	ND	0.10	ug/L							U
Surrogate: 2-Methylnaphthalene-d10		2.00	ug/L	3.00		66.6	31-120			
Surrogate: Dibenzo[a,h]anthracene-d14		3.15	ug/L	3.00		105	10-125			
<b>LCS (BFJ0365-BS1)</b>										
Prepared: 16-Oct-2017 Analyzed: 19-Oct-2017 18:27										
Benzo(a)anthracene	2.24	0.10	ug/L	3.00		74.6	37-120			
Chrysene	2.39	0.10	ug/L	3.00		79.8	48-120			
Benzo(a)fluoranthene, Total	10.3	0.20	ug/L	9.00		114	46-120			
Benzo(a)pyrene	2.07	0.10	ug/L	3.00		69.1	25-120			
Indeno(1,2,3-cd)pyrene	2.82	0.10	ug/L	3.00		94.0	32-120			
Dibenzo(a,h)anthracene	2.27	0.10	ug/L	3.00		75.7	21-120			
Surrogate: 2-Methylnaphthalene-d10		1.62	ug/L	3.00		54.1	31-120			
Surrogate: Dibenzo[a,h]anthracene-d14		2.51	ug/L	3.00		83.8	10-125			
<b>LCS Dup (BFJ0365-BSD1)</b>										
Prepared: 16-Oct-2017 Analyzed: 19-Oct-2017 18:53										
Benzo(a)anthracene	2.19	0.10	ug/L	3.00		73.0	37-120	2.20	30	
Chrysene	2.29	0.10	ug/L	3.00		76.3	48-120	4.51	30	
Benzo(a)fluoranthene, Total	9.41	0.20	ug/L	9.00		105	46-120	9.00	30	
Benzo(a)pyrene	2.01	0.10	ug/L	3.00		67.1	25-120	2.98	30	
Indeno(1,2,3-cd)pyrene	2.61	0.10	ug/L	3.00		87.2	32-120	7.57	30	
Dibenzo(a,h)anthracene	2.23	0.10	ug/L	3.00		74.2	21-120	1.92	30	
Surrogate: 2-Methylnaphthalene-d10		1.91	ug/L	3.00		63.8	31-120			
Surrogate: Dibenzo[a,h]anthracene-d14		2.44	ug/L	3.00		81.4	10-125			



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**Petroleum Hydrocarbons - Quality Control**

**Batch BFJ0359 - EPA 3510C SepF**

Instrument: FID4 Analyst: ML

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BFJ0359-BLK1)</b>		Prepared: 13-Oct-2017 Analyzed: 20-Oct-2017 21:13								
Diesel Range Organics (C12-C24)	ND	100	ug/L							U
Motor Oil Range Organics (C24-C38)	ND	200	ug/L							U
Creosote Range Organics (C12-C22)	ND	200	ug/L							U
<i>Surrogate: o-Terphenyl</i>		413	ug/L	450		91.8	50-150			
<b>LCS (BFJ0359-BS1)</b>		Prepared: 13-Oct-2017 Analyzed: 20-Oct-2017 21:34								
Diesel Range Organics (C12-C24)	2420	100	ug/L	3000		80.6	56-120			
<i>Surrogate: o-Terphenyl</i>		436	ug/L	450		96.9	50-150			
<b>LCS Dup (BFJ0359-BSD1)</b>		Prepared: 13-Oct-2017 Analyzed: 20-Oct-2017 21:58								
Diesel Range Organics (C12-C24)	2570	100	ug/L	3000		85.7	56-120	6.11	30	
<i>Surrogate: o-Terphenyl</i>		443	ug/L	450		98.4	50-150			



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**Phenols - Quality Control**

**Batch BFJ0362 - EPA 3510C SepF**

Instrument: ECD8 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BFJ0362-BLK1)</b>										
					Prepared: 17-Oct-2017 Analyzed: 24-Oct-2017 16:35					
Pentachlorophenol	ND	0.25	ug/L							U
Surrogate: 2,4,6-Tribromophenol		0.794	ug/L	2.50		31.8	26-120			
Surrogate: 2,4,6-Tribromophenol [2C]		0.949	ug/L	2.50		38.0	26-120			
<b>LCS (BFJ0362-BS1)</b>										
					Prepared: 17-Oct-2017 Analyzed: 24-Oct-2017 16:53					
Pentachlorophenol	1.21	0.25	ug/L	2.50		48.6	48-120			
Surrogate: 2,4,6-Tribromophenol		1.21	ug/L	2.50		48.3	26-120			
Surrogate: 2,4,6-Tribromophenol [2C]		1.41	ug/L	2.50		56.3	26-120			
<b>LCS Dup (BFJ0362-BSD1)</b>										
					Prepared: 17-Oct-2017 Analyzed: 24-Oct-2017 17:11					
Pentachlorophenol	1.37	0.25	ug/L	2.50		54.6	48-120	12.40	30	
Surrogate: 2,4,6-Tribromophenol		1.24	ug/L	2.50		49.5	26-120			
Surrogate: 2,4,6-Tribromophenol [2C]		1.43	ug/L	2.50		57.2	26-120			



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8270D in Water</b>	
Phenol	WADOE, DoD-ELAP, NELAP, CALAP
bis(2-chloroethyl) ether	WADOE, DoD-ELAP, NELAP, CALAP
2-Chlorophenol	WADOE, DoD-ELAP, NELAP, CALAP
1,3-Dichlorobenzene	WADOE, DoD-ELAP, NELAP, CALAP
1,4-Dichlorobenzene	WADOE, DoD-ELAP, NELAP, CALAP
1,2-Dichlorobenzene	WADOE, DoD-ELAP, NELAP, CALAP
Benzyl alcohol	WADOE, DoD-ELAP, NELAP, CALAP
2,2'-Oxybis(1-chloropropane)	WADOE, DoD-ELAP, NELAP, CALAP
2-Methylphenol	WADOE, DoD-ELAP, NELAP, CALAP
Hexachloroethane	WADOE, DoD-ELAP, NELAP, CALAP
N-Nitroso-di-n-Propylamine	WADOE, DoD-ELAP, NELAP, CALAP
4-Methylphenol	WADOE, DoD-ELAP, NELAP, CALAP
Nitrobenzene	WADOE, DoD-ELAP, NELAP, CALAP
Isophorone	WADOE, DoD-ELAP, NELAP, CALAP
2-Nitrophenol	WADOE, DoD-ELAP, NELAP, CALAP
2,4-Dimethylphenol	WADOE, DoD-ELAP, NELAP, CALAP
Bis(2-Chloroethoxy)methane	WADOE, DoD-ELAP, NELAP, CALAP
2,4-Dichlorophenol	WADOE, DoD-ELAP, NELAP, CALAP
1,2,4-Trichlorobenzene	WADOE, DoD-ELAP, NELAP, CALAP
Naphthalene	WADOE, DoD-ELAP, NELAP, CALAP, ADEC
Benzoic acid	WADOE, DoD-ELAP, NELAP, CALAP
4-Chloroaniline	WADOE, DoD-ELAP, NELAP, CALAP
2,6-Dinitrotoluene	WADOE, DoD-ELAP, NELAP, CALAP
Hexachlorobutadiene	WADOE, DoD-ELAP, NELAP, CALAP
4-Chloro-3-Methylphenol	WADOE, DoD-ELAP, NELAP, CALAP
Hexachlorocyclopentadiene	WADOE, DoD-ELAP, NELAP, CALAP
2,4,6-Trichlorophenol	WADOE, DoD-ELAP, NELAP, CALAP
2,4,5-Trichlorophenol	WADOE, DoD-ELAP, NELAP, CALAP
2-Chloronaphthalene	WADOE, DoD-ELAP, NELAP, CALAP
2-Nitroaniline	WADOE, DoD-ELAP, NELAP, CALAP
Acenaphthylene	WADOE, DoD-ELAP, NELAP, CALAP, ADEC
Dimethylphthalate	WADOE, DoD-ELAP, NELAP, CALAP
Acenaphthene	WADOE, DoD-ELAP, NELAP, CALAP, ADEC
3-Nitroaniline	WADOE, DoD-ELAP, NELAP, CALAP
2-Methylnaphthalene	WADOE, DoD-ELAP, NELAP, CALAP, ADEC



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

2,4-Dinitrophenol	WADOE,DoD-ELAP,NELAP,CALAP
Dibenzofuran	WADOE,DoD-ELAP,NELAP,CALAP
4-Nitrophenol	WADOE,DoD-ELAP,NELAP,CALAP
2,4-Dinitrotoluene	WADOE,DoD-ELAP,NELAP,CALAP
Fluorene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
4-Chlorophenylphenyl ether	WADOE,DoD-ELAP,NELAP,CALAP
Diethyl phthalate	WADOE,DoD-ELAP,NELAP,CALAP
4-Nitroaniline	WADOE,DoD-ELAP,NELAP,CALAP
4,6-Dinitro-2-methylphenol	WADOE,DoD-ELAP,NELAP,CALAP
N-Nitrosodiphenylamine	WADOE,DoD-ELAP,NELAP,CALAP
4-Bromophenyl phenyl ether	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobenzene	WADOE,DoD-ELAP,NELAP,CALAP
Pentachlorophenol	WADOE,DoD-ELAP,NELAP,CALAP
Phenanthrene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Anthracene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Carbazole	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Di-n-butylphthalate	WADOE,DoD-ELAP,NELAP,CALAP
Fluoranthene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Pyrene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Butylbenzylphthalate	WADOE,DoD-ELAP,NELAP,CALAP
Benzo(a)anthracene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
3,3'-Dichlorobenzidine	WADOE,DoD-ELAP,NELAP,CALAP
Chrysene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
bis(2-Ethylhexyl)phthalate	WADOE,DoD-ELAP,NELAP,CALAP
Di-n-Octylphthalate	WADOE,DoD-ELAP,NELAP,CALAP
Benzo(b)fluoranthene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Benzo(k)fluoranthene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Benzo(a)pyrene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Indeno(1,2,3-cd)pyrene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Dibenzo(a,h)anthracene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Benzo(g,h,i)perylene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Benzofluoranthenes, Total	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
N-Nitrosodimethylamine	WADOE,DoD-ELAP,NELAP,CALAP
Aniline	WADOE,DoD-ELAP,NELAP,CALAP
1-Methylnaphthalene	WADOE,DoD-ELAP,NELAP,CALAP,ADEC
Azobenzene (1,2-DP-Hydrazine)	WADOE,DoD-ELAP,NELAP,CALAP
Benzidine	WADOE,DoD-ELAP
Retene	WADOE,DoD-ELAP
Pyridine	WADOE,DoD-ELAP
2,6-Dichlorophenol	WADOE,DoD-ELAP



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

alpha-Terpineol	WADOE,DoD-ELAP
1,4-Dioxane	WADOE,DoD-ELAP
2,3,4,6-Tetrachlorophenol	WADOE,DoD-ELAP
Triphenyl Phosphate	WADOE,DoD-ELAP
Butyl Diphenyl Phosphate	WADOE,DoD-ELAP
Dibutyl Phenyl Phosphate	WADOE,DoD-ELAP
Tributyl Phosphate	WADOE,DoD-ELAP
Butylated Hydroxytoluene	WADOE,DoD-ELAP
Tetrachloroguaiacol	WADOE,DoD-ELAP
3,4,5-Trichloroguaiacol	WADOE,DoD-ELAP
3,4,6-Trichloroguaiacol	WADOE,DoD-ELAP
4,5,6-Trichloroguaiacol	WADOE,DoD-ELAP
Guaiacol	WADOE,DoD-ELAP
1,2,4,5-Tetrachlorobenzene	WADOE,DoD-ELAP

**NWTPH-Dx in Water**

Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

**NWTPHg in Water**

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP





Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

Reported:  
30-Oct-2017 14:42

Gasoline Range Organics (C5-C12)

WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	09/01/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



Landau Associates, Inc.  
130 2nd Avenue S.  
Edmonds WA, 98020

Project: Cascade Pole  
Project Number: 0021041.010.011  
Project Manager: Christine Kimmel

**Reported:**  
30-Oct-2017 14:42

### Notes and Definitions

- U This analyte is not detected above the applicable reporting or detection limit.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- E The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
- D1 Surrogate was not detected due to sample extract dilution
- D The reported value is from a dilution
- \* Flagged value is not within established control limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.