TECHNICAL MEMORANDUM

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ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Mohsen Kourehdar, P.E., Washington State Department of Ecology

FROM: Lawrence D. Beard, P.E., L.G., and Christine Kimmel, L.G.

DATE: December 15, 2011

RE: GROUNDWATER QUALITY RESULTS
AUGUST 2011 LONG-TERM GROUNDWATER 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 August 2011 groundwater quality sampling event that was conducted as part of the Long-Term Groundwater Compliance Monitoring (LTGCM) program for the Cascade Pole site in Olympia, Washington.

GROUNDWATER MONITORING

Prior to the collection of groundwater samples, groundwater elevations were measured at each of the wells. Groundwater elevation measurements were collected on August 8, 2011, and are presented in Table 1. All interior perimeter well groundwater elevations achieved the hydraulic control goals identified for the site.

A total of 15 samples (14 wells and 1 duplicate sample for quality assurance) were collected during the August 2011 groundwater 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 collected in August 2011 were submitted to Analytical Resources Inc. (ARI) Laboratory located in Tukwila, Washington for analysis of polycyclic aromatic hydrocarbons (PAHs) using U.S. Environmental Protection Agency (EPA) Method 8270D, with selected ion monitoring (SIM); follow-up pentachlorophenol (PCP) analysis was conducted using EPA Method 8041 if PCP results from initial analyses using EPA Method 8270D(SIM) were nondetect at the higher reporting limit; gasoline-range petroleum hydrocarbons (TPH-G) using Method NWTPH-G; and diesel- and oil-range petroleum hydrocarbons (TPH-D and TPH-O, respectively) and creosote using Method NWTPH-Dx.

ANALYTICAL RESULTS

Analytical results for TPH-G and TPH-Dx were compared to Model Toxics Control Act (MTCA) Method A cleanup levels and the PCP and PAH results were compared to the MTCA Method B cleanup

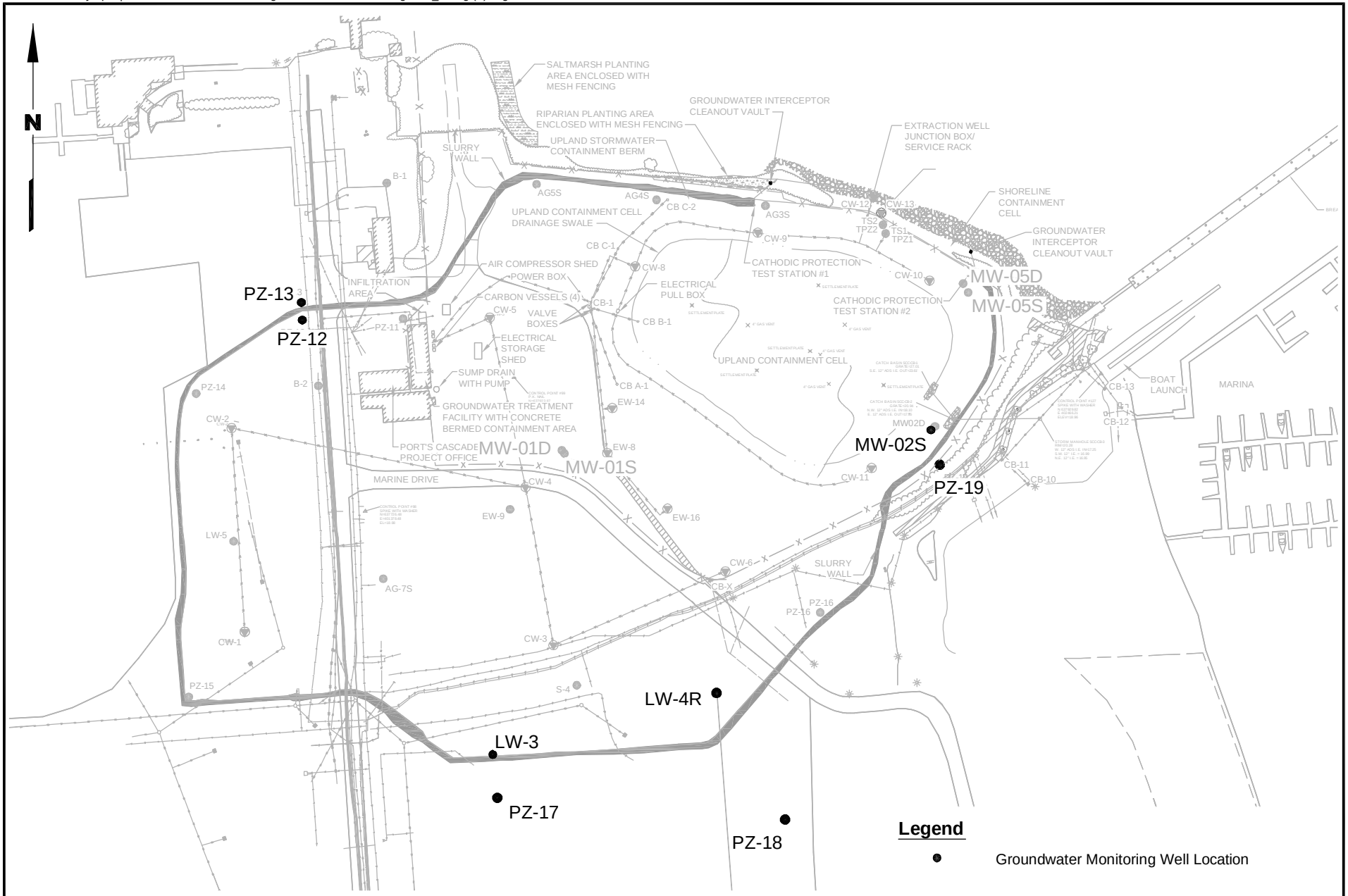
levels for protection of marine surface water. To evaluate the analytical data for carcinogenic polycyclic aromatic hydrocarbons (cPAHs), the toxicity equivalency quotients (TEQ) of individual cPAHs were calculated and summed for comparison to the benzo(a)pyrene cleanup level using the methodology established in 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 August 2011 semiannual sampling event are summarized in Table 2. Analytical data were reviewed for reliability using a data validation process. The results of the validation indicate that data was acceptable for monitoring purposes and no data was rejected. The laboratory report is included in Attachment 1.

The August 2011 analytical results indicate shallow groundwater conditions outside of the slurry wall (monitored at PZ-13, PZ-17, PZ-18, and PZ-19) were below the respective laboratory reporting limits. Analytical results from interior wells PZ-12, LW-4R, and MW-01D were below the respective laboratory reporting limits. Some analytical parameters were reported at interior wells MW-02D, MW-05S, MW-05D, and non-pumping extraction well CW-13at concentrations below their respective cleanup screening levels. Results from shallow interior well MW-01S indicate gasoline-range (55,000 µg/L), diesel-range (9,800 µg/L), and creosote-range (31,000 µg/L) petroleum hydrocarbons, along with individual PAH compounds (naphthalene at 6,900 µg/L and PCP at 4,200 µg/L) and TEQ value for total cPAH (0.529 µg/L), were present at concentrations above their respective cleanup screening levels. Analytical results indicate concentrations above cleanup screening levels at interior shallow well LW-3 for gasoline-range petroleum hydrocarbons (1,400 µg/L) and at interior shallow well MW-02S for motor oil-range petroleum hydrocarbons (990 µg/L).

NEXT SCHEDULED PLANNED ACTIVITIES

The next semiannual sampling event is currently planned for early 2012. The event will include the collection of groundwater quality samples 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 from interior shallow and deep wells MW-01S, MW-01D, MW-02D, MW-05S, MW-05D, and CW-13 will also be collected during the next semiannual event. Groundwater elevations will be collected from each of the selected wells monthly to evaluate the continued hydraulic control for the site.

The results of the August 2011 and early 2012 sampling events will be presented in an annual progress report that will summarize the LTGCM program.



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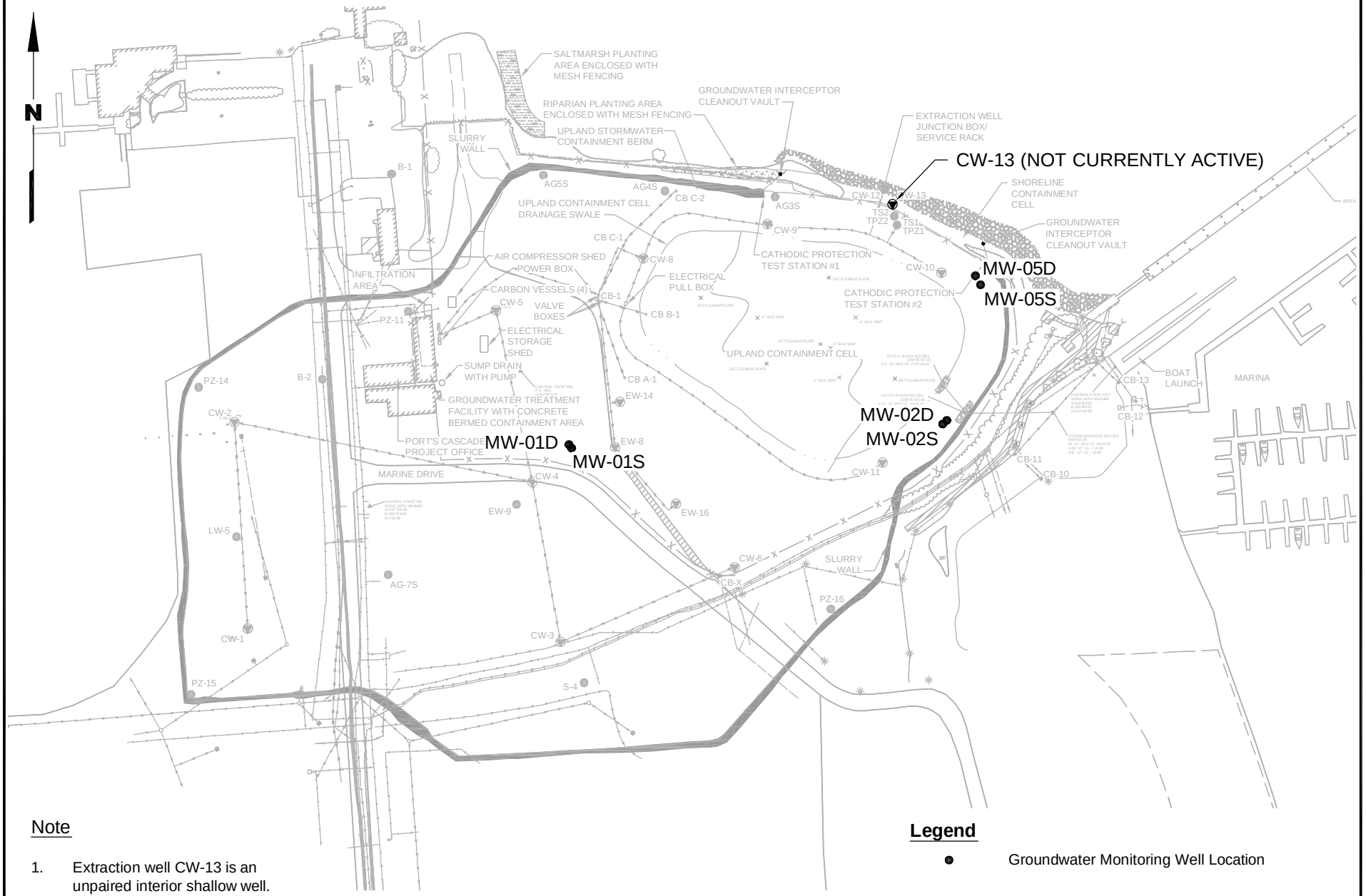
Port of Olympia Olympia, Washington	**Paired Shallow Groundwater Monitoring Network Well Locations**	Figure 1



Note

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

Legend

● Groundwater Monitoring Well Location

0 200 400

Scale in Feet

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Port of Olympia
Olympia, Washington

Deep and Shallow Groundwater Monitoring Well Pairs

Figure
2

TABLE 1
GROUNDWATER ELEVATIONS
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

Well Pair	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?
1	8/8/2011	PZ-13	7.17	19.50		12.33	--	
	8/8/2011	PZ-12	4.96	19.00		14.04	15.50	No
2	8/8/2011	PZ-17	7.24	20.48		13.24	--	
	8/8/2011	LW-3	5.51	19.83		14.32	15.50	No
3	8/8/2011	PZ-18	6.11	21.20		15.09	--	
	8/8/2011	LW-4R	6.56	22.02		15.46	15.50	No
4	8/8/2011	PZ-19	16.19	23.67		7.48	--	
	8/8/2011	MW-02S	17.26	32.46		15.20	15.50	No
5	8/8/2011	MW-02S	17.26	31.96	(c)	14.70	--	
	8/8/2011	MW-02D	21.40	31.81	(c)	10.41	--	
6	8/8/2011	MW-01S	7.20	21.64		14.44	--	
	8/8/2011	MW-01D	10.94	21.87		10.93	--	
7	8/8/2011	MW-05S	14.27	29.45		15.18	16.50	No
	8/8/2011	MW-05D	15.50	26.50		11.00	--	--

MLLW = Mean low low water.

(a) Below top of PVC well casing.
(b) Short-term hydraulic control goal is 15.5 ft along the majority of the cutoff wall alignment and 16.5 ft adjacent to Budd Inlet.
(c) Wells MW02S and MW-02D were modified during 2010 site capping activities.

TABLE 2
SUMMARY OF CURRENT ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels (a)	PZ-12 08/08/2011 TH68B	PZ-13 08/08/2011 TH68A	PZ-17 08/08/2011 TH68C	PZ-18 08/08/2011 TH68F	PZ-19 08/09/2011 TI17B	LW-3 08/08/2011 TH68D	LW-4R 08/08/2011 TH68E	MW-01S 08/09/2011 TI17G	MW-02S 08/09/2011 TI17E	MW-05S 08/09/2011 TI17C
POLYCYCLIC AROMATIC HYDROCARBONS Method 8270D/8270D-SIM (µg/L)											
Naphthalene	4900	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**6900**	1.0 U	1.0 U
2-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**680**	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	1.0 U	1.0 U	1.0 U
Acenaphthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**190**	1.0 U	**7.6**
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**79**	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	**47**	1.0 U	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**4200**	5.0 U	5.0 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**34**	1.0 U	1.0 U
Carbazole		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**24**	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	**10**	**1.1**	**1.1**
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**2.0**	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	**1.7**	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	**1.0**	0.10 U	0.12 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	**1.1**	0.10 U	0.12 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	**0.33**	0.10 U	0.12 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.12 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	0.12 U	0.10 U	0.12 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	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**390**	1.0 U	1.0 U
Total Benzofluoranthenes		0.10 U	0.10 U	0.10 U	0.10 U	0.11 U	0.10 U	0.10 U	**0.76**	0.10 U	0.12 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	**0.517**	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.071	0.071	0.071	0.071	0.078	0.071	0.071	**0.529**	0.071	0.085
PENTACHLOROPHENOL EPA Method 8041 (µg/L)											
Pentachlorophenol	3	0.25 U	0.25 U	0.25 U	0.31 U	0.25 U	0.25 U	0.25 U	NA	0.25 U	0.28 U
PETROLEUM HYDROCARBONS Method NWTPH-G µg/L)											
Gasoline	1,000	250 U	250 U	250 U	250 U	250 U	**1400**	250 U	**55,000**	**480**	250 U
Method NWTPH-Dx (µg/L)											
Diesel	500	100 U	100 U	110 U	120 U	100 U	**170**	110 U	**9800**	**130**	100 U
Motor Oil	500	200 U	200 U	220 U	240 U	200 U	220 U	220 U	1000 U	**990**	200 UJ
Creosote Oil	500	200 U	200 U	220 U	240 U	200 U	**390**	220 U	**31,000**	200 U	200 U

TABLE 2
SUMMARY OF CURRENT ANALYTICAL RESULTS
GROUNDWATER COMPLIANCE MONITORING
CASCADE POLE SITE
PORT OF OLYMPIA, WASHINGTON

	Cleanup Screening Levels (a)	Dup of MW-05S Duplicate 08/09/2011 TI17A	MW-01D 08/09/2011 TI17F	MW-02D 08/09/2011 TI17D	MW05D 08/09/2011 TI17I	CW-13 08/09/2011 TI17H
POLYCYCLIC AROMATIC HYDROCARBONS Method 8270D						
Naphthalene	4900	1.0 U	1.0 U	**110**	**2.1**	**5.2**
2-Methylnaphthalene		1.0 U	1.0 U	**9.4**	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Acenaphthene		**8.1**	1.0 U	**18**	**2.6**	**4.3**
Dibenzofuran		**1.0**	1.0 U	**6.1**	1.0 U	1.0 U
Fluorene		1.0 U	1.0 U	**5.8**	**1.2**	1.0 U
Pentachlorophenol	3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene		1.0 U	1.0 U	**3.9**	1.0 U	1.0 U
Carbazole		1.0 U	1.0 U	**4.9**	1.0 U	**1.4**
Anthracene		**1.3**	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
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.11 U	0.12 U	0.10 U	0.11 U	0.10 U
Chrysene		0.11 U	0.12 U	0.10 U	0.11 U	0.10 U
Benzo(a)Pyrene		0.11 U	0.12 U	0.10 U	0.11 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.11 U	0.12 U	0.10 U	0.11 U	0.10 U
Dibenz(a,h)Anthracene		0.11 U	0.12 U	0.10 U	0.11 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-Methylnaphthalene		1.0 U	1.0 U	**13**	1.0 U	1.0 U
Total Benzofluoranthenes		0.11 U	0.12 U	0.10 U	0.11 U	0.10 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.078	0.085	0.071	0.078	0.071
PENTACHLOROPHENOL EPA Method 8041 (µg/L)						
Pentachlorophenol	3	0.28 U	0.29 U	0.26 U	0.25 U	**1.0**
PETROLEUM HYDROCARBONS Method NWTPH-G µg/L)						
Gasoline	1,000	250 U	250 U	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)						
Diesel	500	**110**	100 U	**140**	100 U	100 U
Motor Oil	500	**500** J	200 U	200 U	200 U	200 U
Creosote Oil	500	200 U	200 U	**440**	200 U	200 U

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) Screening levels are MTCA Method B for marine surface water for cPAHs and PCP; MTCA Method A for TPH-G/TPH-Dx.
(b) TEQ = toxicity equivalency factor 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 Analytical Results

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 24, 2011

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

RE: Project: Port of Olympia
ARI Job No: TH68

Dear Chris:

Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted six water samples and a trip blank in good condition on August 9, 2011.

The samples were analyzed for NWTPH-Gx, NWTPH-Dx, cPAHs by method 8270 SIM, PAHs by method 8270 and PCP on select samples by method 8041, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.

Eric Branson
Project Manager
-for-
Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Case Narrative

Project: 0021035.010
ARI Job No.: TH68
August 24, 2011

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted six water samples and a trip blank in good condition on August 9, 2011. The samples were received at cooler temperatures between 3.4 and 5.8°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

Semivolatile Organics by method 8270D Water

The samples were extracted on 8/11/11. The samples were analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Samples: Sample **LW-3-20110808** was analyzed at an additional 3x dilution when the original had no detections at regular strength because the nature of the sample matrix caused one surrogate to be recovered out of control low.

There were no other anomalies associated with these samples.

Surrogates: d14-p-Terphenyl was out of control in the original analytical run of sample **LW-3-20110808**. It was in control in the diluted reanalysis, and no further corrective action was taken.

All other surrogate recoveries were in control.

LCS/LSCD (s): Are in control.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

SIM PNA by method 8270-SIM Water

The samples were extracted on 8/11/11 and analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): The relative percent difference (RPD) between recoveries for the LCS and LCSD for Dibenz(a,h)anthracene exceeded the 40% allowable limit. The individual percent recoveries were in control. No further corrective action was taken.

All percent recoveries and other RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Case Narrative

Project: 0021035.010
ARI Job No.: TH68
August 24, 2011
Page 2 of 3

Continuing Calibrations: Are in control.

PCP Only by method 8041

The samples were extracted on 8/12/11 and analyzed on 8/17/11 and 8/18/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Gx

The samples were analyzed on 8/11/11 - within the method recommended holding time.

Samples: The vial for sample **LW-3-20110808** contained headspace (significant air). Per method recommendations, the vial should contain little to no air.

There were no other anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 8/10/11 and analyzed on 8/17/11 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Case Narrative

Project: 0021035.010
ARI Job No.: TH68
August 24, 2011

Continuing Calibrations: Are in control.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: TH68
Client: Landau Associates, Inc.
Project Event: 0021035.010
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PZ-13-20110808	TH68A	11-17282	Water	08/08/11 14:31	08/09/11 08:20
2.	PZ-12-20110808	TH68B	11-17283	Water	08/08/11 14:30	08/09/11 08:20
3.	PZ-17-20110808	TH68C	11-17284	Water	08/08/11 16:35	08/09/11 08:20
4.	LW-3-20110808	TH68D	11-17285	Water	08/08/11 16:30	08/09/11 08:20
5.	LW-4R-20110808	TH68E	11-17286	Water	08/08/11 18:30	08/09/11 08:20
6.	PZ-18-20110808	TH68F	11-17287	Water	08/08/11 18:31	08/09/11 08:20
7.	Trip Blanks	TH68G	11-17288	Water	08/08/11	08/09/11 08:20

Printed 08/09/11

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S — Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA — The flagged analyte was not analyzed for

NR — Spiked compound recovery is not reported due to chromatographic interference

NS — The flagged analyte was not spiked into the sample

M — Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 — The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N — The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y — The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC — Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C — The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P — The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X — Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z — Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

LANDAU ASSOCIATES

☒ **Seattle/Edmonds** (425) 778-0907
☐ **Tacoma** (253) 926-2493
☐ **Spokane** (509) 327-9737
☐ **Portland** (503) 542-1080
☐ _____

TH68

Chain-of-Custody Record

Date 08/8/11
Page 1 of 1

Project Name Port of Olympia Project No. 0021035.010
Project Location/Event Cascade Pole, Dry-season
Sampler's Name Jessica Stone, Toni Smith
Project Contact Chris Kimmel
Send Results To Chris Kimmel

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	TPH-Gx	TPH-Dx + Creosote	PAHs (8270)	cPAHs SIM	PCP (8270)	PCP (8041)	Observations/Comments
PZ-13-20110808	8/8/11	1431	H_2O	10	X	X	X	X	X	X	
PZ-12-20110808	8/8/11	1430	H_2O	10	X	X	X	X	X	X	
TRIP BLANKS	8/8/11	—	H_2O	2	X						
PZ-17-20110808	8/8/11	1635	H_2O	10	X	X	X	X	X	X	
LW-3-20110808	8/8/11	1630	H_2O	10	X	X	X	X	X	X	
LW-4R-20110808	8/8/11	1830	H_2O	10	X	X	X	X	X	X	
PZ-18-20110808	8/8/11	1831	H_2O	10	X	X	X	X	X	X	

Observations/Comments:
- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified

VOC/BTEX/VPH (soil):
- ___ non-preserved
- ___ preserved w/methanol
- ___ preserved w/sodium bisulfate
- ___ Freeze upon receipt

- ___ Dissolved metal water samples field filtered

Other Run all samples for PCP using 8270-SIM IF result = ND, then = and only then run PCP by 8041

Special Shipment/Handling or Storage Requirements 4 coolers + ice

Method of Shipment Delivery

Relinquished by	Received by	Relinquished by	Received by
Signature Sarah Weeks	Signature A. Volgardsen	Signature	Signature
Printed Name Sarah Weeks	Printed Name ARI	Printed Name	Printed Name
Company Landau Assoc. Inc	Company	Company	Company
Date 08/8/11 Time 2105	Date 8/9/11 Time 820	Date Time	Date Time

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 8/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau

Project Name: Port of Olympia

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: Night Box

Assigned ARI Job No: TH168

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) 5.8 4.9 3.4 4.6 ___ ___

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941161 9

Cooler Accepted by: AV Date: 8/9/11 Time: 820

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 8/3/11

Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: AV Date: 8/9/11 Time: 1020

***** 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:

PZ-12 = 1SM LW-4R = 2PB TB = 2PB
LW-3 = 2LG PZ-18 = 2PB

By AV Date 8/9/11

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • • •	● ● ●

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-13-20110808
SAMPLE

Lab Sample ID: TH68A
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 22:49
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	56.4%
d14-p-Terphenyl	49.6%
2,4,6-Tribromophenol	65.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: PZ-12-20110808
SAMPLE

Lab Sample ID: TH68B
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 23:22
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	66.0%
2,4,6-Tribromophenol	73.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: PZ-17-20110808
SAMPLE

Lab Sample ID: TH68C
LIMS ID: 11-17284
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 23:55
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	66.8%
2,4,6-Tribromophenol	77.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LW-3-20110808
SAMPLE

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 00:27
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	66.4%
d14-p-Terphenyl	23.1%
2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LW-3-20110808
DILUTION

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 18:29
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	3.0	< 3.0 U
208-96-8	Acenaphthylene	3.0	< 3.0 U
83-32-9	Acenaphthene	3.0	< 3.0 U
132-64-9	Dibenzofuran	3.0	< 3.0 U
86-73-7	Fluorene	3.0	< 3.0 U
87-86-5	Pentachlorophenol	15	< 15 U
85-01-8	Phenanthrene	3.0	< 3.0 U
86-74-8	Carbazole	3.0	< 3.0 U
120-12-7	Anthracene	3.0	< 3.0 U
206-44-0	Fluoranthene	3.0	< 3.0 U
129-00-0	Pyrene	3.0	< 3.0 U
56-55-3	Benzo(a)anthracene	3.0	< 3.0 U
218-01-9	Chrysene	3.0	< 3.0 U
50-32-8	Benzo(a)pyrene	3.0	< 3.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	< 3.0 U
53-70-3	Dibenz(a,h)anthracene	3.0	< 3.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	< 3.0 U
90-12-0	1-Methylnaphthalene	3.0	< 3.0 U
TOTBFA	Total Benzofluoranthenes	3.0	< 3.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	30.7%
2,4,6-Tribromophenol	76.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LW-4R-20110808
SAMPLE

Lab Sample ID: TH68E
LIMS ID: 11-17286
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 01:00
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	67.6%
d14-p-Terphenyl	65.2%
2,4,6-Tribromophenol	80.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-18-20110808
SAMPLE

Lab Sample ID: TH68F
LIMS ID: 11-17287
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 01:33
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	62.0%
d14-p-Terphenyl	61.2%
2,4,6-Tribromophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	FBP	TPH	TBP	TOT OUT
PZ-13-20110808	56.4%	49.6%	65.6%	0
MB-081111	73.2%	91.2%	76.8%	0
LCS-081111	65.6%	82.0%	78.4%	0
LCSD-081111	63.2%	82.8%	75.5%	0
PZ-12-20110808	62.8%	66.0%	73.3%	0
PZ-17-20110808	66.0%	66.8%	77.9%	0
LW-3-20110808	66.4%	23.1%*	76.8%	1
LW-3-20110808 DL	70.8%	30.7%	76.4%	0
LW-4R-20110808	67.6%	65.2%	80.8%	0
PZ-18-20110808	62.0%	61.2%	75.2%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)

Prep Method: SW3520C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LCS-081111
LCS/LCSD

Lab Sample ID: LCS-081111
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted LCS/LCSD: 08/11/11

Date Analyzed LCS: 08/16/11 21:43
LCSD: 08/16/11 22:16
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	14.6	25.0	58.4%	14.7	25.0	58.8%	0.7%
2-Methylnaphthalene	14.8	25.0	59.2%	14.8	25.0	59.2%	0.0%
Acenaphthylene	15.6	25.0	62.4%	15.9	25.0	63.6%	1.9%
Acenaphthene	16.0	25.0	64.0%	16.9	25.0	67.6%	5.5%
Dibenzofuran	16.7	25.0	66.8%	17.4	25.0	69.6%	4.1%
Fluorene	16.5	25.0	66.0%	17.0	25.0	68.0%	3.0%
Pentachlorophenol	61.9	75.0	82.5%	62.9	75.0	83.9%	1.6%
Phenanthrene	18.7	25.0	74.8%	19.1	25.0	76.4%	2.1%
Carbazole	17.4	25.0	69.6%	18.4	25.0	73.6%	5.6%
Anthracene	17.6	25.0	70.4%	18.1	25.0	72.4%	2.8%
Fluoranthene	18.6	25.0	74.4%	18.8	25.0	75.2%	1.1%
Pyrene	19.9	25.0	79.6%	20.7	25.0	82.8%	3.9%
Benzo(a)anthracene	19.2	25.0	76.8%	19.8	25.0	79.2%	3.1%
Chrysene	18.5	25.0	74.0%	19.2	25.0	76.8%	3.7%
Benzo(a)pyrene	17.2	25.0	68.8%	17.8	25.0	71.2%	3.4%
Indeno(1,2,3-cd)pyrene	19.9	25.0	79.6%	22.4	25.0	89.6%	11.8%
Dibenz(a,h)anthracene	19.1	25.0	76.4%	22.0	25.0	88.0%	14.1%
Benzo(g,h,i)perylene	20.5	25.0	82.0%	23.8	25.0	95.2%	14.9%
1-Methylnaphthalene	15.3	25.0	61.2%	15.4	25.0	61.6%	0.7%
Total Benzofluoranthenes	38.4	50.0	76.8%	39.6	50.0	79.2%	3.1%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	65.6%	63.2%
d14-p-Terphenyl	82.0%	82.8%
2,4,6-Tribromophenol	78.4%	75.5%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-081111
METHOD BLANK

Lab Sample ID: MB-081111
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 21:10
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	73.2%
d14-p-Terphenyl	91.2%
2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-13-20110808
SAMPLE

Lab Sample ID: TH68A
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 19:59
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.3%
d14-Dibenzo(a,h)anthracene	49.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-12-20110808
SAMPLE

Lab Sample ID: TH68B
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 20:34
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	62.7%
d14-Dibenzo(a,h)anthracene	46.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-17-20110808
SAMPLE

Lab Sample ID: TH68C
LIMS ID: 11-17284
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 21:50
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	61.0%
d14-Dibenzo(a,h)anthracene	29.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LW-3-20110808
SAMPLE

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 22:24
Instrument/Analyst: NT4/JZ

Sample Amount: 480 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.3%
d14-Dibenzo(a,h)anthracene	20.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LW-4R-20110808
SAMPLE

Lab Sample ID: TH68E
LIMS ID: 11-17286
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 22:58
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	32.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-18-20110808
SAMPLE

Lab Sample ID: TH68F
LIMS ID: 11-17287
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 23:32
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	55.0%
d14-Dibenzo(a,h)anthracene	21.7%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	MNP	DBA	TOT OUT
MB-081111	68.0%	67.3%	0
LCS-081111	66.0%	47.0%	0
LCSD-081111	62.0%	70.0%	0
PZ-13-20110808	64.3%	49.0%	0
PZ-12-20110808	62.7%	46.0%	0
PZ-17-20110808	61.0%	29.7%	0
LW-3-20110808	68.3%	20.7%	0
LW-4R-20110808	60.7%	32.7%	0
PZ-18-20110808	55.0%	21.7%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(40-110)	(33-107)
(DBA) = d14-Dibenzo(a,h)anthracene	(33-140)	(10-142)

Prep Method: SW3520C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-081111
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081111
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 08/11/11

Date Analyzed LCS: 08/16/11 18:17
LCSD: 08/16/11 18:51
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	2.04	3.00	68.0%	2.01	3.00	67.0%	1.5%
Chrysene	2.18	3.00	72.7%	2.18	3.00	72.7%	0.0%
Benzo(a)pyrene	1.98	3.00	66.0%	2.15	3.00	71.7%	8.2%
Indeno(1,2,3-cd)pyrene	1.58	3.00	52.7%	2.08	3.00	69.3%	27.3%
Dibenz(a,h)anthracene	1.38	3.00	46.0%	2.14	3.00	71.3%	43.2%
Total Benzofluoranthenes	4.75	6.00	79.2%	5.51	6.00	91.8%	14.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	66.0%	62.0%
d14-Dibenzo(a,h)anthracene	47.0%	70.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-081111
METHOD BLANK

Lab Sample ID: MB-081111
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 17:43
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.0%
d14-Dibenzo(a,h)anthracene	67.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-13-20110808
SAMPLE

Lab Sample ID: TH68A
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 23:23
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	68.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-12-20110808
SAMPLE

Lab Sample ID: TH68B
LIMS ID: 11-17283
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 23:59
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: PZ-17-20110808
SAMPLE

Lab Sample ID: TH68C
LIMS ID: 11-17284
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 00:36
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	74.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LW-3-20110808
SAMPLE

Lab Sample ID: TH68D
LIMS ID: 11-17285
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 01:12
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	67.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: LW-4R-20110808
SAMPLE

Lab Sample ID: TH68E
LIMS ID: 11-17286
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 01:48
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	66.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041 **Sample ID: PZ-18-20110808**
Page 1 of 1 **SAMPLE**

Lab Sample ID: TH68F
LIMS ID: 11-17287
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 02:25
Instrument/Analyst: ECD1/AAR

Sample Amount: 400 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.31	< 0.31 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	51.6%

ANALYTICAL RESOURCES INCORPORATED

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	TBP	TOT OUT
MB-081211	93.6%	0
LCS-081211	86.0%	0
LCSD-081211	90.0%	0
PZ-13-20110808	68.0%	0
PZ-12-20110808	75.2%	0
PZ-17-20110808	74.8%	0
LW-3-20110808	67.6%	0
LW-4R-20110808	66.0%	0
PZ-18-20110808	51.6%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(40-130)	(11-156)

Prep Method: SW3510C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: LCS-081211
LCS/LCSD

Lab Sample ID: LCS-081211
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted LCS/LCSD: 08/12/11

Date Analyzed LCS: 08/17/11 20:21
LCSD: 08/17/11 20:58
Instrument/Analyst LCS: ECD1/AAR
LCSD: ECD1/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 50 mL
LCSD: 50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pentachlorophenol	2.29	2.50	91.6%	2.40	2.50	96.0%	4.7%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	86.0%	90.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MB-081211
METHOD BLANK

Lab Sample ID: MB-081211
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 19:45
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	93.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 08/24/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-081111	Method Blank	08/11/11	1.0	Gasoline	< 250 U
11-17282		PID2		HC ID	---
				Trifluorotoluene	96.3%
				Bromobenzene	100%
TH68A	PZ-13-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17282		PID2		HC ID	---
				Trifluorotoluene	104%
				Bromobenzene	104%
TH68B	PZ-12-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17283		PID2		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	101%
TH68C	PZ-17-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17284		PID2		HC ID	---
				Trifluorotoluene	101%
				Bromobenzene	101%
TH68D	LW-3-20110808	08/11/11	1.0	**Gasoline**	**1400**
11-17285		PID2		HC ID	GRO
				Trifluorotoluene	99.6%
				Bromobenzene	101%
TH68E	LW-4R-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17286		PID2		HC ID	---
				Trifluorotoluene	97.8%
				Bromobenzene	100%
TH68F	PZ-18-20110808	08/11/11	1.0	Gasoline	< 250 U
11-17287		PID2		HC ID	---
				Trifluorotoluene	99.5%
				Bromobenzene	100%
TH68G	Trip Blanks	08/11/11	1.0	Gasoline	< 250 U
11-17288		PID2		HC ID	---
				Trifluorotoluene	104%
				Bromobenzene	103%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: TH68
Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010

Client ID	TFT	BBZ	TOT OUT
MB-081111	96.3%	100%	0
LCS-081111	105%	104%	0
LCSD-081111	106%	107%	0
PZ-13-20110808	104%	104%	0
PZ-12-20110808	101%	101%	0
PZ-17-20110808	101%	101%	0
LW-3-20110808	99.6%	101%	0
LW-4R-20110808	97.8%	100%	0
PZ-18-20110808	99.5%	100%	0
Trip Blanks	104%	103%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 11-17282 to 11-17288

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Page 1 of 1

Sample ID: LCS-081111
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081111
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/24/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035.010
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 08/11/11 06:24
LCSD: 08/11/11 06:52
Instrument/Analyst LCS: PID2/PKC
LCSD: PID2/PKC

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	950	1000	95.0%	940	1000	94.0%	1.1%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	105%	106%
Bromobenzene	104%	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Data Release Authorized:
Reported: 08/22/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-081011	Method Blank	08/10/11	08/17/11	1.00	Diesel	100	< 100 U
11-17282	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		88.9%
TH68A	PZ-13-20110808	08/10/11	08/17/11	1.00	Diesel	100	< 100 U
11-17282	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		103%
TH68B	PZ-12-20110808	08/10/11	08/17/11	1.00	Diesel	100	< 100 U
11-17283	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		107%
TH68C	PZ-17-20110808	08/10/11	08/17/11	1.00	Diesel	110	< 110 U
11-17284	HC ID: ---		FID4A	1.0	Motor Oil	220	< 220 U
					Creosote	220	< 220 U
					o-Terphenyl		111%
TH68D	LW-3-20110808	08/10/11	08/17/11	1.00	**Diesel**	**110**	**170**
11-17285	HC ID: **DRO**		FID4A	1.0	Motor Oil	220	< 220 U
					Creosote	**220**	**390**
					o-Terphenyl		108%
TH68E	LW-4R-20110808	08/10/11	08/17/11	1.00	Diesel	110	< 110 U
11-17286	HC ID: ---		FID4A	1.0	Motor Oil	220	< 220 U
					Creosote	220	< 220 U
					o-Terphenyl		107%
TH68F	PZ-18-20110808	08/10/11	08/17/11	1.00	Diesel	120	< 120 U
11-17287	HC ID: ---		FID4A	1.0	Motor Oil	240	< 240 U
					Creosote	240	< 240 U
					o-Terphenyl		89.5%

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
Creosote quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010

Client ID	OTER	TOT OUT
MB-081011	88.9%	0
LCS-081011	109%	0
LCSD-081011	103%	0
PZ-13-20110808	103%	0
PZ-12-20110808	107%	0
PZ-17-20110808	111%	0
LW-3-20110808	108%	0
LW-4R-20110808	107%	0
PZ-18-20110808	89.5%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 11-17282 to 11-17287

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-081011**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-081011
LIMS ID: 11-17282
Matrix: Water
Data Release Authorized:
Reported: 08/24/11

QC Report No: TH68-Landau Associates, Inc.
Project: Port of Olympia
0021035.010
Date Sampled: 08/08/11
Date Received: 08/09/11

Date Extracted LCS/LCSD: 08/10/11
Date Analyzed LCS: 08/17/11 02:39
LCSD: 08/17/11 03:02
Instrument/Analyst LCS: FID/AAR
LCSD: FID/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	3060	3000	102%	2990	3000	99.7%	2.3%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	109%	103%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: TH68
Matrix: Water Project: Port of Olympia
Date Received: 08/09/11 0021035.010

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
11-17282-081011MB1	Method Blank	500 mL	1.00 mL	08/10/11
11-17282-081011LCS1	Lab Control	500 mL	1.00 mL	08/10/11
11-17282-081011LCSD1	Lab Control Dup	500 mL	1.00 mL	08/10/11
11-17282-TH68A	PZ-13-20110808	500 mL	1.00 mL	08/10/11
11-17283-TH68B	PZ-12-20110808	500 mL	1.00 mL	08/10/11
11-17284-TH68C	PZ-17-20110808	450 mL	1.00 mL	08/10/11
11-17285-TH68D	LW-3-20110808	460 mL	1.00 mL	08/10/11
11-17286-TH68E	LW-4R-20110808	445 mL	1.00 mL	08/10/11
11-17287-TH68F	PZ-18-20110808	410 mL	1.00 mL	08/10/11

Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 24, 2011

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

RE: Project: Port of Olympia
ARI Job No: TI17

Dear Chris:

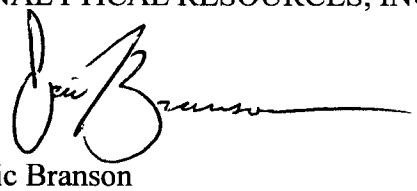
Please find enclosed the original *Chain of Custody*, sample receipt documentation, and final results for the project referenced above. Analytical Resources, Inc. accepted nine water samples and a trip blank in good condition on August 10, 2011.

The samples were analyzed for NWTPH-Gx, NWTPH-Dx, cPAHs by method 8270 SIM, PAHs by method 8270 and PCP on select samples by method 8041, as requested on the *Chain of Custody*.

Please refer to the *Case Narrative* for analytical details regarding the sample.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to contact me at any time.

Sincerely,
ANALYTICAL RESOURCES, INC.



Eric Branson
Project Manager
-for-
Kelly Bottem
Client Services Manager
(206) 695-6211

Enclosures

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Case Narrative

Project: 0021035.010
ARI Job No.: TI17
August 24, 2011
Page 1 of 3

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted nine water samples and a trip blank in good condition on August 10, 2011. The samples were received at cooler temperatures between 1.2 and 5.9°C. Please see the *Cooler Receipt Form* for further details. Per Landau Associates, select samples were allowed to settle and sample volume was collected from the clear portion.

The following tests were performed on selected samples, as requested on the *Chain of Custody*.

Semivolatile Organics by method 8270D Water

The samples were extracted on 8/11/11. The samples were analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Samples: Samples **MW-02D-20110809** and **MW-01S-20110809** required additional analytical runs at dilution in order to properly quantify select detections within a reportable range. Both runs have been reported.

There were no other anomalies associated with these samples.

Surrogates: The surrogates were diluted beyond recovery in the diluted analysis of sample **MW-01S-20110809**. They were recovered in control in the original run.

All other surrogate recoveries were in control.

LCS/LSCD (s): Are in control.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

SIM PNA by method 8270-SIM Water

The samples were extracted on 8/15/11 and analyzed between 8/19/11 and 8/22/11 - within the method recommended holding time.

Samples: Internal Standard Naphthalene-d8 was not recoverable for the original analysis of sample **MW-01S-20110809**. It was in control in the follow-up analysis at dilution. Both runs have been reported.

There were no other anomalies associated with these samples.

Surrogates: d10-2-Methylnaphthalene was out of control low in the original analysis of sample. **MW-01s-20110809**. Both surrogates were diluted beyond recovery in the diluted analysis. No further corrective action was taken.

All other surrogate recoveries were in control.

Case Narrative

Project: 0021035.010
ARI Job No.: TI17
August 24, 2011
Page 2 of 3

LCS/LSCD (s): All percent recoveries and other RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

PCP Only by method 8041

The samples were extracted on 8/12/11 and analyzed on 8/17/11 and 8/18/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LSCD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Gx

The samples were analyzed on 8/12/11 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: All surrogate recoveries were in control.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

NWTPH-Dx

The samples were extracted on 8/12/11 and analyzed on 8/16/11 and 8/17/11 - within the method recommended holding time.

Surrogates: All surrogate recoveries were in control.

Samples: There were no anomalies associated with these samples.

LCS/LCSD (s): All percent recoveries and RPDs for the analytes of interest were within compliance.

Case Narrative

Project: 0021035.010
ARI Job No.: TI17
August 24, 2011
Page 3 of 3

Method Blank: The method blank was free of contamination.

Continuing Calibrations: Are in control.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: TI17
Client: Landau Associates, Inc.
Project Event: 0021035-010
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PZ-30-20110809	TI17A	11-17528	Water	08/09/11 09:45	08/10/11 14:30
2.	PZ-19-20110809	TI17B	11-17529	Water	08/09/11 09:40	08/10/11 14:30
3.	MW-05S-20110809	TI17C	11-17530	Water	08/09/11 09:49	08/10/11 14:30
4.	MW-02D-20110809	TI17D	11-17531	Water	08/09/11 11:10	08/10/11 14:30
5.	MW-02S-20110809	TI17E	11-17532	Water	08/09/11 11:27	08/10/11 14:30
6.	MW-01D-20110809	TI17F	11-17533	Water	08/09/11 14:20	08/10/11 14:30
7.	MW-01S-20110809	TI17G	11-17534	Water	08/09/11 13:59	08/10/11 14:30
8.	CW-13-20110809	TI17H	11-17535	Water	08/09/11 17:00	08/10/11 14:30
9.	MW05D-20110809	TI17I	11-17536	Water	08/09/11 17:41	08/10/11 14:30
10.	Trip Blanks	TI17J	11-17537	Water	08/09/11	08/10/11 14:30

Printed 08/10/11

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NR	Spiked compound recovery is not reported due to chromatographic interference
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
M2	The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
EMPC	Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference
X	Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
Z	Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

LANDAU ASSOCIATES

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

Chain-of-Custody Record

Date 8/9/2011
Page 1 of 1

Project Name Port of Olympia Project No. 002035.010
Project Location/Event Cascade Pole, Dry-Season
Sampler's Name Jessica Stone, Tori Smith
Project Contact Chris Kimmel
Send Results To Chris Kimmel

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: TPH-Gx	TPH-Dx + (Acid/Silica)	PAHs (8270)	cPAHs SIM	PCP (8270)	PCP (8041)	Observations/Comments
PZ-30-20110809	8/9/11	0945	H_2O	10	X	X	X	X	X	X	
PZ-19-20110809		0940		10	X	X	X	X	X	X	
MW-05S-20110809		0949		10	X	X	X	X	X	X	
Trip Blanks		–		4	X						
MW-02D-20110809		1110		10	X	X	X	X	X	X	
MW-02S-20110809		1127		10	X	X	X	X	X	X	
MW-01D-20110809		1420		10	X	X	X	X	X	X	
MW-01S-20110809		1359		10	X	X	X	X	X	X	
CW-13-20110809		1700		10	X	X	X	X	X	X	
MW050-20110809		1741		10	X	X	X	X	X	X	

Observations/Comments:
- X Allow water samples to settle, collect aliquot from clear portion
- X NWTPH-Dx - run acid wash/silica gel cleanup
- ___ run samples standardized to _____ product
- ___ Analyze for EPH if no specific product identified
- VOC/BTEX/VPH (soil):
  - ___ non-preserved
  - ___ preserved w/methanol
  - ___ preserved w/sodium bisulfate
  - ___ Freeze upon receipt
- ___ Dissolved metal water samples field filtered
- Other Run all samples for PCP using 8270-SIM. IF result = ND, then and only then run PCP by 8041

Special Shipment/Handling or Storage Requirements: 6 coolers with ice

Method of Shipment: Delivery

Relinquished by	Received by	Relinquished by	Received by
Signature: Sarah Weeks	Signature: A. Volgardsen	Signature:	Signature:
Printed Name: Sarah Weeks	Printed Name: ARI	Printed Name:	Printed Name:
Company: Landau Associates, Inc.	Company:	Company:	Company:
Date: 8/9/2011 Time: 2000	Date: 8/10/11 Time: 1430	Date: Time:	Date: Time:

WHITE COPY - Project File YELLOW COPY - Laboratory PINK COPY - Client Representative

Rev 8/09

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau
Project Name: Port of Olympia
COC No(s): _____ (NA)
Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: Night Drop
Assigned ARI Job No: TII7
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) 1.9 3.8 3.0 5.9 1.2 3.3
If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: 90941619

Cooler Accepted by: AV Date: 8/10/11 Time: 1430

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	8/3/11	

Was Sample Split by ARI : (NA) YES Date/Time._____ Equipment._____ Split by:_____

Samples Logged by: JM Date: 8/10/11 Time: 1547

***** 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:

PZ-30 = sm in 1 of 2
PZ-19 = pb in 1 of 2
MW-055 = sm in 1 of 2
MW-025 = sm in 1 of 2
Trip Blank - pb in 4 of 4
MW-025 = 20110809 had 8 Containers

By: JM Date: 8/10/11

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
• • •	• • •	● ● ●

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-30-20110809
SAMPLE

Lab Sample ID: TI17A
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 02:06
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**8.1**
132-64-9	**Dibenzofuran**	**1.0**	**1.0**
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	**Anthracene**	**1.0**	**1.3**
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	75.6%
d14-p-Terphenyl	54.8%
2,4,6-Tribromophenol	86.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: PZ-19-20110809
SAMPLE

Lab Sample ID: TI17B
LIMS ID: 11-17529
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 14:07
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	71.6%
d14-p-Terphenyl	88.0%
2,4,6-Tribromophenol	78.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: MW-05S-20110809**
Page 1 of 1 **SAMPLE**

Lab Sample ID: TI17C
LIMS ID: 11-17530
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 14:39
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**7.6**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	**Anthracene**	**1.0**	**1.1**
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	70.4%
d14-p-Terphenyl	60.0%
2,4,6-Tribromophenol	76.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-02D-20110809
SAMPLE

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 15:12
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**92 ES**
91-57-6	**2-Methylnaphthalene**	**1.0**	**9.4**
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**18**
132-64-9	**Dibenzofuran**	**1.0**	**6.1**
86-73-7	**Fluorene**	**1.0**	**5.8**
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	**Phenanthrene**	**1.0**	**3.9**
86-74-8	**Carbazole**	**1.0**	**4.9**
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	**1-Methylnaphthalene**	**1.0**	**13**
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	62.0%
d14-p-Terphenyl	83.6%
2,4,6-Tribromophenol	68.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-02D-20110809
DILUTION

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 19:02
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**3.0**	**110**
91-57-6	**2-Methylnaphthalene**	**3.0**	**9.2**
208-96-8	Acenaphthylene	3.0	< 3.0 U
83-32-9	**Acenaphthene**	**3.0**	**18**
132-64-9	**Dibenzofuran**	**3.0**	**5.8**
86-73-7	**Fluorene**	**3.0**	**6.1**
87-86-5	Pentachlorophenol	15	< 15 U
85-01-8	**Phenanthrene**	**3.0**	**3.9**
86-74-8	**Carbazole**	**3.0**	**4.9**
120-12-7	Anthracene	3.0	< 3.0 U
206-44-0	Fluoranthene	3.0	< 3.0 U
129-00-0	Pyrene	3.0	< 3.0 U
56-55-3	Benzo(a)anthracene	3.0	< 3.0 U
218-01-9	Chrysene	3.0	< 3.0 U
50-32-8	Benzo(a)pyrene	3.0	< 3.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.0	< 3.0 U
53-70-3	Dibenz(a,h)anthracene	3.0	< 3.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	< 3.0 U
90-12-0	**1-Methylnaphthalene**	**3.0**	**13**
TOTBFA	Total Benzofluoranthenes	3.0	< 3.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	63.0%
d14-p-Terphenyl	80.2%
2,4,6-Tribromophenol	67.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-02S-20110809
SAMPLE

Lab Sample ID: TI17E
LIMS ID: 11-17532
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 15:45
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	**Anthracene**	**1.0**	**1.1**
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	52.4%
2,4,6-Tribromophenol	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-01D-20110809
SAMPLE

Lab Sample ID: TI17F
LIMS ID: 11-17533
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 16:18
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	68.0%
d14-p-Terphenyl	84.4%
2,4,6-Tribromophenol	74.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: MW-01S-20110809
SAMPLE

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 16:51
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**1,200 ES**
91-57-6	**2-Methylnaphthalene**	**1.0**	**560 ES**
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**190 ES**
132-64-9	**Dibenzofuran**	**1.0**	**79**
86-73-7	**Fluorene**	**1.0**	**47**
87-86-5	**Pentachlorophenol**	**5.0**	**6,200 ES**
85-01-8	**Phenanthrene**	**1.0**	**34**
86-74-8	**Carbazole**	**1.0**	**24**
120-12-7	**Anthracene**	**1.0**	**10**
206-44-0	**Fluoranthene**	**1.0**	**2.0**
129-00-0	**Pyrene**	**1.0**	**1.7**
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	**1-Methylnaphthalene**	**1.0**	**370 ES**
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	70.8%
d14-p-Terphenyl	33.0%
2,4,6-Tribromophenol	77.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW-01S-20110809
DILUTION

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 20:40
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 100

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**100**	**6,900**
91-57-6	**2-Methylnaphthalene**	**100**	**680**
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	**100**	**190**
132-64-9	Dibenzofuran	100	< 100 U
86-73-7	Fluorene	100	< 100 U
87-86-5	**Pentachlorophenol**	**500**	**4,200**
85-01-8	Phenanthrene	100	< 100 U
86-74-8	Carbazole	100	< 100 U
120-12-7	Anthracene	100	< 100 U
206-44-0	Fluoranthene	100	< 100 U
129-00-0	Pyrene	100	< 100 U
56-55-3	Benzo(a)anthracene	100	< 100 U
218-01-9	Chrysene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U
90-12-0	**1-Methylnaphthalene**	**100**	**390**
TOTBFA	Total Benzofluoranthenes	100	< 100 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	D
d14-p-Terphenyl	D
2,4,6-Tribromophenol	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: CW-13-20110809
SAMPLE

Lab Sample ID: TI17H
LIMS ID: 11-17535
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 20:08
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**5.2**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**4.3**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	**Carbazole**	**1.0**	**1.4**
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	58.0%
d14-p-Terphenyl	76.4%
2,4,6-Tribromophenol	69.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MW05D-20110809
SAMPLE

Lab Sample ID: TI17I
LIMS ID: 11-17536
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/11/11
Date Analyzed: 08/17/11 17:56
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**1.0**	**2.1**
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	**Acenaphthene**	**1.0**	**2.6**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	**Fluorene**	**1.0**	**1.2**
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	56.8%
d14-p-Terphenyl	53.2%
2,4,6-Tribromophenol	69.3%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	FBP	TPH	TBP	TOT OUT
MB-081111	73.2%	91.2%	76.8%	0
LCS-081111	65.6%	82.0%	78.4%	0
LCSD-081111	63.2%	82.8%	75.5%	0
PZ-30-20110809	75.6%	54.8%	86.7%	0
PZ-19-20110809	71.6%	88.0%	78.7%	0
MW-05S-20110809	70.4%	60.0%	76.5%	0
MW-02D-20110809	62.0%	83.6%	68.8%	0
MW-02D-20110809 DL	63.0%	80.2%	67.1%	0
MW-02S-20110809	70.8%	52.4%	72.3%	0
MW-01D-20110809	68.0%	84.4%	74.1%	0
MW-01S-20110809	70.8%	33.0%	77.9%	0
MW-01S-20110809 DL	D	D	D	0
CW-13-20110809	58.0%	76.4%	69.9%	0
MW05D-20110809	56.8%	53.2%	69.3%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)

Prep Method: SW3520C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: LCS-081111
LCS/LCSD

Lab Sample ID: LCS-081111
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted LCS/LCSD: 08/11/11

Date Analyzed LCS: 08/16/11 21:43
LCSD: 08/16/11 22:16
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	14.6	25.0	58.4%	14.7	25.0	58.8%	0.7%
2-Methylnaphthalene	14.8	25.0	59.2%	14.8	25.0	59.2%	0.0%
Acenaphthylene	15.6	25.0	62.4%	15.9	25.0	63.6%	1.9%
Acenaphthene	16.0	25.0	64.0%	16.9	25.0	67.6%	5.5%
Dibenzofuran	16.7	25.0	66.8%	17.4	25.0	69.6%	4.1%
Fluorene	16.5	25.0	66.0%	17.0	25.0	68.0%	3.0%
Pentachlorophenol	61.9	75.0	82.5%	62.9	75.0	83.9%	1.6%
Phenanthrene	18.7	25.0	74.8%	19.1	25.0	76.4%	2.1%
Carbazole	17.4	25.0	69.6%	18.4	25.0	73.6%	5.6%
Anthracene	17.6	25.0	70.4%	18.1	25.0	72.4%	2.8%
Fluoranthene	18.6	25.0	74.4%	18.8	25.0	75.2%	1.1%
Pyrene	19.9	25.0	79.6%	20.7	25.0	82.8%	3.9%
Benzo(a)anthracene	19.2	25.0	76.8%	19.8	25.0	79.2%	3.1%
Chrysene	18.5	25.0	74.0%	19.2	25.0	76.8%	3.7%
Benzo(a)pyrene	17.2	25.0	68.8%	17.8	25.0	71.2%	3.4%
Indeno(1,2,3-cd)pyrene	19.9	25.0	79.6%	22.4	25.0	89.6%	11.8%
Dibenz(a,h)anthracene	19.1	25.0	76.4%	22.0	25.0	88.0%	14.1%
Benzo(g,h,i)perylene	20.5	25.0	82.0%	23.8	25.0	95.2%	14.9%
1-Methylnaphthalene	15.3	25.0	61.2%	15.4	25.0	61.6%	0.7%
Total Benzofluoranthenes	38.4	50.0	76.8%	39.6	50.0	79.2%	3.1%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	65.6%	63.2%
d14-p-Terphenyl	82.0%	82.8%
2,4,6-Tribromophenol	78.4%	75.5%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-081111
METHOD BLANK

Lab Sample ID: MB-081111
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/18/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/11/11
Date Analyzed: 08/16/11 21:10
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	1.0	< 1.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	73.2%
d14-p-Terphenyl	91.2%
2,4,6-Tribromophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-30-20110809
SAMPLE

Lab Sample ID: TI17A
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 20:18
Instrument/Analyst: NT4/JZ

Sample Amount: 440 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.11	< 0.11 U
218-01-9	Chrysene	0.11	< 0.11 U
50-32-8	Benzo(a)pyrene	0.11	< 0.11 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.11	< 0.11 U
53-70-3	Dibenz(a,h)anthracene	0.11	< 0.11 U
TOTBFA	Total Benzofluoranthenes	0.11	< 0.11 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	66.7%
d14-Dibenzo(a,h)anthracene	52.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: PZ-19-20110809
SAMPLE

Lab Sample ID: TI17B
LIMS ID: 11-17529
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 20:52
Instrument/Analyst: NT4/JZ

Sample Amount: 460 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.11	< 0.11 U
218-01-9	Chrysene	0.11	< 0.11 U
50-32-8	Benzo(a)pyrene	0.11	< 0.11 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.11	< 0.11 U
53-70-3	Dibenz(a,h)anthracene	0.11	< 0.11 U
TOTBFA	Total Benzofluoranthenes	0.11	< 0.11 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.0%
d14-Dibenzo(a,h)anthracene	80.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-05S-20110809
SAMPLE

Lab Sample ID: TI17C
LIMS ID: 11-17530
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 21:27
Instrument/Analyst: NT4/JZ

Sample Amount: 430 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.12	< 0.12 U
218-01-9	Chrysene	0.12	< 0.12 U
50-32-8	Benzo(a)pyrene	0.12	< 0.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.12	< 0.12 U
53-70-3	Dibenz(a,h)anthracene	0.12	< 0.12 U
TOTBFA	Total Benzofluoranthenes	0.12	< 0.12 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	57.7%
d14-Dibenzo(a,h)anthracene	45.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-02D-20110809
SAMPLE

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 22:01
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	59.3%
d14-Dibenzo(a,h)anthracene	61.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-02S-20110809
SAMPLE

Lab Sample ID: TI17E
LIMS ID: 11-17532
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 22:35
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	65.7%
d14-Dibenzo(a,h)anthracene	45.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01D-20110809
SAMPLE

Lab Sample ID: TI17F
LIMS ID: 11-17533
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 23:09
Instrument/Analyst: NT4/JZ

Sample Amount: 430 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.12	< 0.12 U
218-01-9	Chrysene	0.12	< 0.12 U
50-32-8	Benzo(a)pyrene	0.12	< 0.12 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.12	< 0.12 U
53-70-3	Dibenz(a,h)anthracene	0.12	< 0.12 U
TOTBFA	Total Benzofluoranthenes	0.12	< 0.12 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	67.0%
d14-Dibenzo(a,h)anthracene	61.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01S-20110809
SAMPLE

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 23:44
Instrument/Analyst: NT4/JZ

Sample Amount: 425 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	**Benzo(a)anthracene**	**0.12**	**1.0**
218-01-9	**Chrysene**	**0.12**	**1.1**
50-32-8	**Benzo(a)pyrene**	**0.12**	**0.33**
193-39-5	Indeno(1,2,3-cd)pyrene	0.12	< 0.12 U
53-70-3	Dibenz(a,h)anthracene	0.12	< 0.12 U
TOTBFA	**Total Benzofluoranthenes**	**0.12**	**0.76**

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	3.3%
d14-Dibenzo(a,h)anthracene	26.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW-01S-20110809
DILUTION

Lab Sample ID: TI17G
LIMS ID: 11-17534
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/22/11 15:35
Instrument/Analyst: NT4/JZ

Sample Amount: 425 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 100

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	12	< 12 U
218-01-9	Chrysene	12	< 12 U
50-32-8	Benzo(a)pyrene	12	< 12 U
193-39-5	Indeno(1,2,3-cd)pyrene	12	< 12 U
53-70-3	Dibenz(a,h)anthracene	12	< 12 U
TOTBFA	Total Benzofluoranthenes	12	< 12 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	D
d14-Dibenzo(a,h)anthracene	D

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: CW-13-20110809
SAMPLE

Lab Sample ID: TI17H
LIMS ID: 11-17535
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/20/11 00:18
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	54.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MW05D-20110809
SAMPLE

Lab Sample ID: TI17I
LIMS ID: 11-17536
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/15/11
Date Analyzed: 08/20/11 00:52
Instrument/Analyst: NT4/JZ

Sample Amount: 440 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.11	< 0.11 U
218-01-9	Chrysene	0.11	< 0.11 U
50-32-8	Benzo(a)pyrene	0.11	< 0.11 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.11	< 0.11 U
53-70-3	Dibenz(a,h)anthracene	0.11	< 0.11 U
TOTBFA	Total Benzofluoranthenes	0.11	< 0.11 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.0%
d14-Dibenzo(a,h)anthracene	66.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	MNP	DBA	TOT OUT
MB-081511	58.7%	57.0%	0
LCS-081511	59.0%	57.7%	0
LCSD-081511	46.3%	69.3%	0
PZ-30-20110809	66.7%	52.3%	0
PZ-19-20110809	63.0%	80.7%	0
MW-05S-20110809	57.7%	45.3%	0
MW-02D-20110809	59.3%	61.0%	0
MW-02S-20110809	65.7%	45.0%	0
MW-01D-20110809	67.0%	61.7%	0
MW-01S-20110809	3.3%*	26.7%	1
MW-01S-20110809 DL	D	D	0
CW-13-20110809	60.7%	54.0%	0
MW05D-20110809	64.0%	66.0%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(40-110)	(33-107)
(DBA) = d14-Dibenzo(a,h)anthracene	(33-140)	(10-142)

Prep Method: SW3520C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: LCS-081511
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081511
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 08/15/11

Date Analyzed LCS: 08/19/11 18:02
LCSD: 08/19/11 18:36
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzo(a)anthracene	2.26	3.00	75.3%	2.34	3.00	78.0%	3.5%
Chrysene	2.46	3.00	82.0%	2.54	3.00	84.7%	3.2%
Benzo(a)pyrene	2.17	3.00	72.3%	2.06	3.00	68.7%	5.2%
Indeno(1,2,3-cd)pyrene	1.87	3.00	62.3%	2.13	3.00	71.0%	13.0%
Dibenz(a,h)anthracene	1.79	3.00	59.7%	2.13	3.00	71.0%	17.3%
Total Benzofluoranthenes	5.02	6.00	83.7%	5.73	6.00	95.5%	13.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	59.0%	46.3%
d14-Dibenzo(a,h)anthracene	57.7%	69.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: MB-081511
METHOD BLANK

Lab Sample ID: MB-081511
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized: MW
Reported: 08/23/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/15/11
Date Analyzed: 08/19/11 17:28
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.7%
d14-Dibenzo(a,h)anthracene	57.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-30-20110809
SAMPLE

Lab Sample ID: TI17A
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 13:34
Instrument/Analyst: ECD1/AAR

Sample Amount: 450 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.28	< 0.28 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	74.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: PZ-19-20110809
SAMPLE

Lab Sample ID: TI17B
LIMS ID: 11-17529
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 14:11
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	89.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MW-05S-20110809
SAMPLE

Lab Sample ID: TI17C
LIMS ID: 11-17530
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 14:47
Instrument/Analyst: ECD1/AAR

Sample Amount: 450 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.28	< 0.28 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	78.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-02D-20110809
SAMPLE

Lab Sample ID: TI17D
LIMS ID: 11-17531
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 15:23
Instrument/Analyst: ECD1/AAR

Sample Amount: 475 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.26	< 0.26 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	94.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MW-02S-20110809
SAMPLE

Lab Sample ID: TI17E
LIMS ID: 11-17532
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 16:00
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	72.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: MW-01D-20110809
SAMPLE

Lab Sample ID: TI17F
LIMS ID: 11-17533
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 16:36
Instrument/Analyst: ECD1/AAR

Sample Amount: 425 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.29	< 0.29 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	88.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: CW-13-20110809
SAMPLE

Lab Sample ID: TI17H
LIMS ID: 11-17535
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 17:12
Instrument/Analyst: ECD1/AAR

Sample Amount: 425 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	**Pentachlorophenol**	**0.29**	**1.0**

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	83.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MW05D-20110809
SAMPLE

Lab Sample ID: TI17I
LIMS ID: 11-17536
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted: 08/12/11
Date Analyzed: 08/18/11 17:48
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	92.8%

ANALYTICAL RESOURCES INCORPORATED

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	TBP	TOT OUT
MB-081211	93.6%	0
LCS-081211	86.0%	0
LCSD-081211	90.0%	0
PZ-30-20110809	74.8%	0
PZ-19-20110809	89.6%	0
MW-05S-20110809	78.4%	0
MW-02D-20110809	94.0%	0
MW-02S-20110809	72.4%	0
MW-01D-20110809	88.4%	0
CW-13-20110809	83.6%	0
MW05D-20110809	92.8%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(40-130)	(11-156)

Prep Method: SW3510C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Page 1 of 1

Sample ID: LCS-081211
LCS/LCSD

Lab Sample ID: LCS-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted LCS/LCSD: 08/12/11

Date Analyzed LCS: 08/17/11 20:21
LCSD: 08/17/11 20:58
Instrument/Analyst LCS: ECD1/AAR
LCSD: ECD1/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 50 mL
LCSD: 50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Pentachlorophenol	2.29	2.50	91.6%	2.40	2.50	96.0%	4.7%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	86.0%	90.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: MB-081211
METHOD BLANK

Lab Sample ID: MB-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/19/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: NA
Date Received: NA

Date Extracted: 08/12/11
Date Analyzed: 08/17/11 19:45
Instrument/Analyst: ECD1/AAR

Sample Amount: 500 mL
Final Extract Volume: 50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
87-86-5	Pentachlorophenol	0.25	< 0.25 U

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery	
2,4,6-Tribromophenol	93.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-081211	Method Blank	08/12/11	1.0	Gasoline	< 250 U
11-17528		PID1		HC ID	---
				Trifluorotoluene	97.6%
				Bromobenzene	97.8%
TI17A	PZ-30-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17528		PID1		HC ID	---
				Trifluorotoluene	97.6%
				Bromobenzene	95.7%
TI17B	PZ-19-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17529		PID1		HC ID	---
				Trifluorotoluene	98.3%
				Bromobenzene	99.3%
TI17C	MW-05S-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17530		PID1		HC ID	---
				Trifluorotoluene	98.5%
				Bromobenzene	98.3%
TI17D	MW-02D-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17531		PID1		HC ID	---
				Trifluorotoluene	100%
				Bromobenzene	99.3%
TI17E	MW-02S-20110809	08/12/11	1.0	**Gasoline**	**480**
11-17532		PID1		HC ID	GAS/GRO
				Trifluorotoluene	98.8%
				Bromobenzene	99.3%
TI17F	MW-01D-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17533		PID1		HC ID	---
				Trifluorotoluene	99.4%
				Bromobenzene	98.4%
TI17G	MW-01S-20110809	08/12/11	50	**Gasoline**	**55000**
11-17534		PID1		HC ID	GAS/GRO
				Trifluorotoluene	89.1%
				Bromobenzene	93.1%
TI17H	CW-13-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17535		PID1		HC ID	---
				Trifluorotoluene	96.8%
				Bromobenzene	97.1%
TI17I	MW05D-20110809	08/12/11	1.0	Gasoline	< 250 U
11-17536		PID1		HC ID	---
				Trifluorotoluene	98.3%
				Bromobenzene	98.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
TI17J	Trip Blanks	08/12/11	1.0	Gasoline	< 250 U
11-17537		PID1		HC ID	---
				Trifluorotoluene	99.3%
				Bromobenzene	98.4%

Gasoline values reported in µg/L (ppb)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

ANALYTICAL RESOURCES INCORPORATED

TPHG WATER SURROGATE RECOVERY SUMMARY

ARI Job: TI17
Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010

Client ID	TFT	BBZ	TOT OUT
MB-081211	97.6%	97.8%	0
LCS-081211	103%	97.9%	0
LCSD-081211	102%	99.9%	0
PZ-30-20110809	97.6%	95.7%	0
PZ-19-20110809	98.3%	99.3%	0
MW-05S-20110809	98.5%	98.3%	0
MW-02D-20110809	100%	99.3%	0
MW-02S-20110809	98.8%	99.3%	0
MW-01D-20110809	99.4%	98.4%	0
MW-01S-20110809	89.1%	93.1%	0
CW-13-20110809	96.8%	97.1%	0
MW05D-20110809	98.3%	98.7%	0
Trip Blanks	99.3%	98.4%	0

	LCS/MB LIMITS	QC LIMITS
(TFT) = Trifluorotoluene	(80-120)	(80-120)
(BBZ) = Bromobenzene	(80-120)	(80-120)

Log Number Range: 11-17528 to 11-17537

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-081211
LAB CONTROL SAMPLE

Lab Sample ID: LCS-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
Event: 0021035-010
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 08/12/11 06:28
LCSD: 08/12/11 06:57
Instrument/Analyst LCS: PID1/MS
LCSD: PID1/MS

Purge Volume: 5.0 mL

Dilution Factor LCS: 1.0
LCSD: 1.0

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	1130	1000	113%	1060	1000	106%	6.4%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	103%	102%
Bromobenzene	97.9%	99.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 2
Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Data Release Authorized:
Reported: 08/22/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-081211	Method Blank	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17528	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		98.6%
TI17A	PZ-30-20110809	08/12/11	08/16/11	1.00	**Diesel**	**100**	**110**
11-17528	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**200**	**500**
					Creosote	200	< 200 U
					o-Terphenyl		117%
TI17B	PZ-19-20110809	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17529	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		121%
TI17C	MW-05S-20110809	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17530	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		91.1%
TI17D	MW-02D-20110809	08/12/11	08/16/11	1.00	**Diesel**	**100**	**140**
11-17531	HC ID: **CREOSOTE**		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	**200**	**440**
					o-Terphenyl		126%
TI17E	MW-02S-20110809	08/12/11	08/16/11	1.00	**Diesel**	**100**	**130**
11-17532	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**200**	**990**
					Creosote	200	< 200 U
					o-Terphenyl		108%
TI17F	MW-01D-20110809	08/12/11	08/16/11	1.00	Diesel	100	< 100 U
11-17533	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		105%
TI17G	MW-01S-20110809	08/12/11	08/16/11	1.00	**Diesel**	**500**	**9800**
11-17534	HC ID: **CREOSOTE**		FID4A	5.0	Motor Oil	1000	< 1000 U
					Creosote	**1000**	**31000**
					o-Terphenyl		104%
TI17H	CW-13-20110809	08/12/11	08/17/11	1.00	Diesel	100	< 100 U
11-17535	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		116%
TI17I	MW05D-20110809	08/12/11	08/17/11	1.00	Diesel	100	< 100 U
11-17536	HC ID: ---		FID4A	1.0	Motor Oil	200	< 200 U
					Creosote	200	< 200 U
					o-Terphenyl		115%

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS

ANALYTICAL RESOURCES INCORPORATED

NWTPHD by GC/FID-Silica and Acid Cleaned
Page 2 of 2
Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Data Release Authorized:
Reported: 08/22/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result

Reported in ug/L (ppb)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
Creosote quantitation on total peaks in the range from C12 to C22.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010

Client ID	OTER	TOT OUT
MB-081211	98.6%	0
LCS-081211	103%	0
LCSD-081211	114%	0
PZ-30-20110809	117%	0
PZ-19-20110809	121%	0
MW-05S-20110809	91.1%	0
MW-02D-20110809	126%	0
MW-02S-20110809	108%	0
MW-01D-20110809	105%	0
MW-01S-20110809	104%	0
CW-13-20110809	116%	0
MW05D-20110809	115%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C
Log Number Range: 11-17528 to 11-17536

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-081211**
 LCS/LCSD

Lab Sample ID: LCS-081211
LIMS ID: 11-17528
Matrix: Water
Data Release Authorized:
Reported: 08/22/11

QC Report No: TI17-Landau Associates, Inc.
Project: Port of Olympia
0021035-010
Date Sampled: 08/09/11
Date Received: 08/10/11

Date Extracted LCS/LCSD: 08/12/11
Date Analyzed LCS: 08/16/11 20:24
LCSD: 08/16/11 20:48
Instrument/Analyst LCS: FID/MS
LCSD: FID/MS

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2860	3000	95.3%	3110	3000	104%	8.4%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	103%	114%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water
Date Received: 08/10/11

ARI Job: TI17
Project: Port of Olympia
0021035-010

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
11-17528-081211MB1	Method Blank	500 mL	1.00 mL	08/12/11
11-17528-081211LCS1	Lab Control	500 mL	1.00 mL	08/12/11
11-17528-081211LCSD1	Lab Control Dup	500 mL	1.00 mL	08/12/11
11-17528-TI17A	PZ-30-20110809	500 mL	1.00 mL	08/12/11
11-17529-TI17B	PZ-19-20110809	500 mL	1.00 mL	08/12/11
11-17530-TI17C	MW-05S-20110809	500 mL	1.00 mL	08/12/11
11-17531-TI17D	MW-02D-20110809	500 mL	1.00 mL	08/12/11
11-17532-TI17E	MW-02S-20110809	500 mL	1.00 mL	08/12/11
11-17533-TI17F	MW-01D-20110809	500 mL	1.00 mL	08/12/11
11-17534-TI17G	MW-01S-20110809	500 mL	1.00 mL	08/12/11
11-17535-TI17H	CW-13-20110809	500 mL	1.00 mL	08/12/11
11-17536-TI17I	MW05D-20110809	500 mL	1.00 mL	08/12/11