TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
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: September 9, 2013

RE: GROUNDWATER QUALITY RESULTS
OCTOBER 2012 LONG-TERM COMPLIANCE MONITORING
CASCADE POLE SITE, OLYMPIA, WASHINGTON

At the request of Mr. Don Bache of the Port of Olympia, we are providing the Washington State Department of Ecology (Ecology) with the results of the October 2012 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 October 24, 2012, and are presented in Table 1. All interior perimeter well groundwater elevations achieved the hydraulic control goals indentified for the site. Initially, an accurate depth to water was not available at LW-3 due to evidence of surface water migration to the well. An elevated water level and a large amount of wood debris were observed at LW-3. The well was redeveloped twice using aggressive purging methods to remove the material. Once suspended material was removed from LW-3, an accurate depth to water was recorded and a groundwater sample was collected.

A total of 15 samples (14 wells and 1 duplicate sample for quality assurance) were collected during the October 2012 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 October 2012 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 pentachlorophenal (PCP) 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 the carcinogenic PAHs (cPAHs), the toxicity equivalency quotients (TEQ) of individual cPAHs were calculated and summed for comparison to the benzo(a)pyrene cleanup level using the methodology established in Washington Administrative Code (WAC) 173-340-708. To calculate the TEQ, the toxicity equivalency factor (TEF) for a given cPAH compound was multiplied by the compound concentration, or half the reporting limit for compounds that were not detected above the laboratory reporting limit, and the resulting values were summed. The analytical results for the October 2012 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 is acceptable for monitoring purposes and no data was rejected. The laboratory reports are included in Attachment 1.

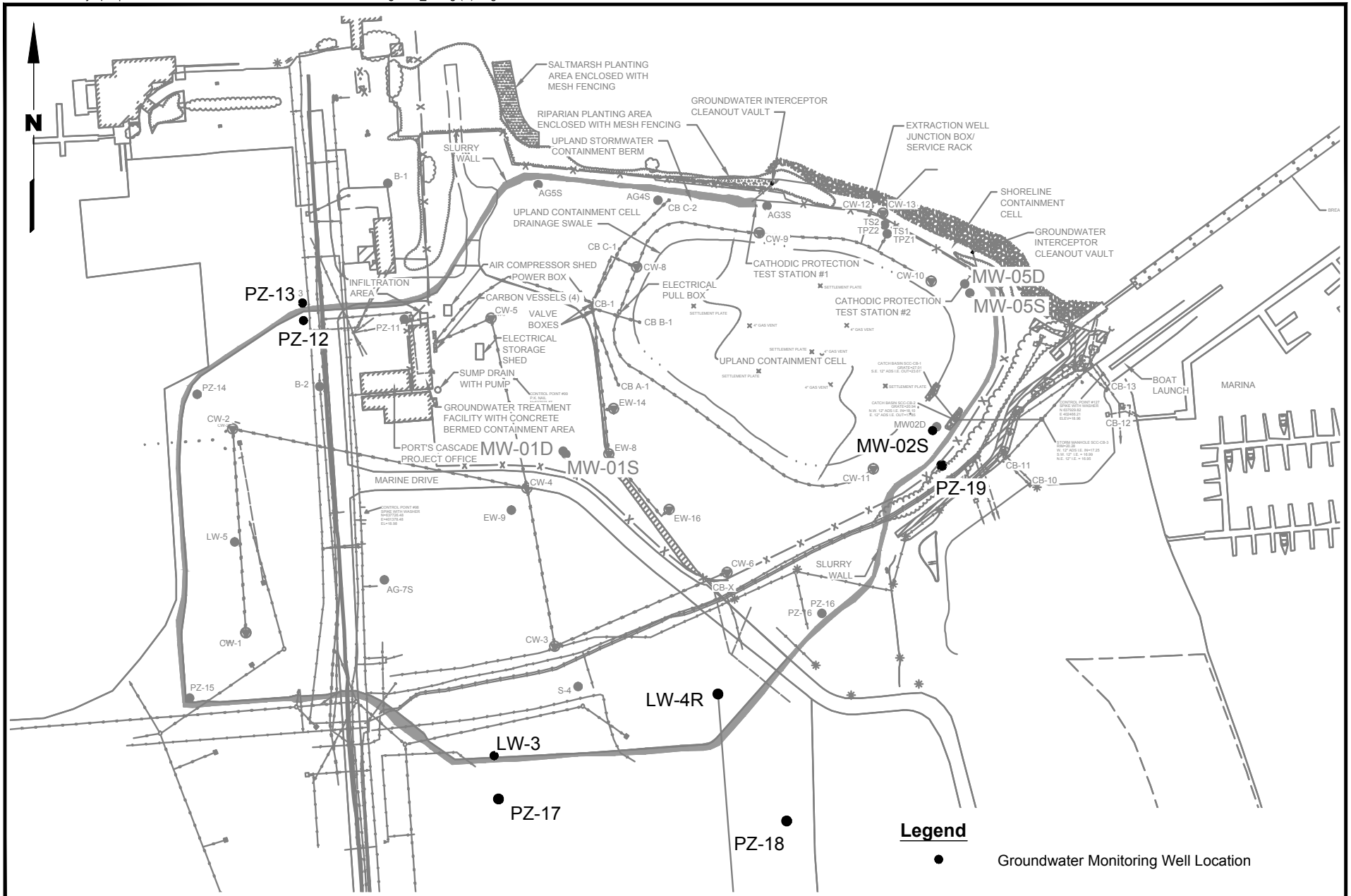
The October 2012 analytical results indicate shallow groundwater conditions outside of the slurry wall (monitored at PZ-13, PZ-17, PZ-18, and PZ-19) were below the respective laboratory reporting limits. Analytical results from interior wells LW-4R and MW-01D were also below the respective laboratory reporting limits. Low level concentrations were reported at interior wells PZ-12, MW-02S, MW-05S, MW-05D, and non-pumping extraction well CW-13; however, the concentrations were below their respective cleanup screening levels. Analytical results from shallow interior well MW-01S indicate the following compounds were reported at concentrations greater than the respective cleanup screening levels: TPH-G (34,000 µg/L), diesel-range petroleum hydrocarbons (6,200 µg/L), and creosote-range hydrocarbons (44,000 µg/L), along with individual PAH compounds (PCP at 4,300 µg/L) and TEQ value for total cPAH (1.2 µg/L). Analytical results indicate concentrations above cleanup screening levels at interior shallow wells LW-3 for TPH-G (4,100 µg/L) and creosote-range hydrocarbons (2,800 µg/L). Analytical results indicate concentrations above cleanup screening levels at interior deep well MW-02D for creosote-range hydrocarbons (910 µg/L).

NEXT SCHEDULED PLANNED ACTIVITIES

The next semiannual sampling event is currently planned for early 2013. 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-02S, 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 potential for surface water migration at LW-3 will continue to be monitored on a monthly basis. If further signs of surface water effects are observed at this well, then the well may be considered for replacement.

The results of the October 2012 and early 2013 sampling events will be presented in an annual progress report that will summarize the LTGCM program.

Port of Olympia | V:\021\039\020.021\CPC Oct 2012 LTGWCM TM - Figure 1_2.dwg (A) "Figure 1" 11/28/2012



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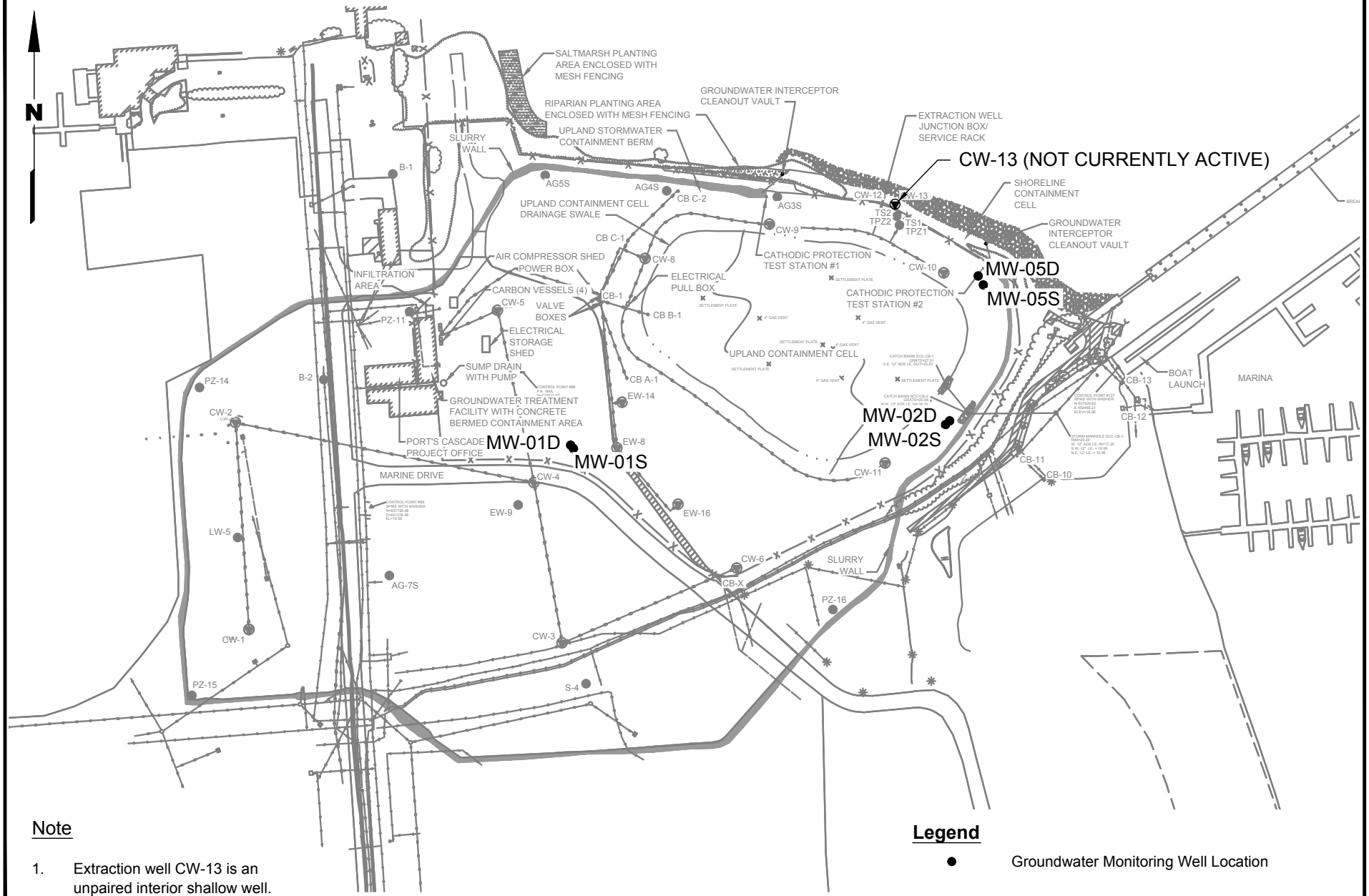
Port of Olympia Olympia, Washington	**Paired Shallow Groundwater Monitoring Network Well Locations**	Figure 1



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	10/24/2012	PZ-13	6.81	19.50		12.69	--	
	10/24/2012	PZ-12	4.13	19.00		14.87	15.50	No
2	10/24/2012	PZ-17	7.62	20.48		12.86	--	
	10/24/2012	LW-3	4.06	19.83	(c)	15.77	15.50	Yes
3	10/24/2012	PZ-18	6.90	21.20		14.30	--	
	10/24/2012	LW-4R	6.99	22.02		15.03	15.50	No
4	10/24/2012	PZ-19	15.59	23.67		8.08	--	
	10/24/2012	MW-02S	16.50	31.96		15.46	15.50	No
5	10/24/2012	MW-02S	16.50	31.96	(d)(e)	15.46	--	
	10/24/2012	MW-02D	20.12	31.81	(d)(e)	11.69	--	
6	10/24/2012	MW-01S	6.49	21.64		15.15	--	
	10/24/2012	MW-01D	9.30	21.72	(f)	12.42	--	
7	10/24/2012	MW-05S	13.45	29.45	(d)	16.00	16.50	No
	10/24/2012	MW-05D	14.10	26.50	(d)	12.40	--	--

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) Well LW-3 casing modified and re-surveyed January 2009. On 7/28/10, the well casing at LW-3 cut down 0.2 ft to make room for new well monument lid. Elevation was adjusted from 20.03 to 19.83.
(d) Wells MW-02S, MW-02D, MW-05S, and MW-05D were modified during construction activities and re-surveyed in February 2009.
(e) MW-02D and MW-02S inner north rim elevations were modified in September 2011.
(f) On 12/8/11, the inner well casing was cut down at MW-01D by 0.15 ft. The outer casing was cut down corresponding amount. New MW-01D measuring point elevation is 21.72 ft MLLW.

NOTE: Groundwater elevations determined by subtracting depth to groundwater below top of casing (ft) from top of well casing elevation (MLLW, ft).

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

	Cleanup Screening Levels For Groundwater (a)	PZ-12 10/25/2012 VP53F	PZ-13 10/25/2012 VP53A	PZ-17 10/26/2012 VP53G	PZ-18 10/24/2012 VP10B	PZ-19 10/24/2012 VP10C	LW-3 10/26/2012 VP53H	LW-4R 10/24/2012 VP10F	MW-01S 10/25/2012 VP53D	MW-02S 10/24/2012 VP10H	MW-05S 10/24/2012 VP10E	Dup of MW-05S PZ-30 10/24/2012 VP10D
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)												
EPA Method 8270D / 8270D-SIM												
Naphthalene	4900	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**4600**	1.0 U	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	**710**	1.0 U	1.0 U	1.0 U
Acenaphthylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**10**	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	**220**	1.0 U	**8.2**	**10**
Dibenzofuran		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**110**	1.0 U	1.0 U	1.0 U
Fluorene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**90**	1.0 U	1.0 U	1.0 U
Pentachlorophenol	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**4300**	10 U	10 U	10 U
Phenanthrene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**82**	1.0 U	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	**52**	1.0 U	1.0 U	1.0 U
Anthracene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**21**	1.0 U	**1.0**	**1.2**
Fluoranthene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**18**	1.0 U	1.0 U	1.0 U
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**8.9**	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	**2.5**	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	**2.4**	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.76**	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	**0.11**	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 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	**560**	1.0 U	1.0 U	1.0 U
Total Benzofluoranthenes		0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.5**	0.20 U	0.20 U	0.20 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND	ND	ND	ND	**1.2**	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076	0.076	0.076	0.076	**1.2**	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)												
EPA Method 8041/8270C,D												
Pentachlorophenol	3	**0.31**	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA	0.25 U	0.25 U	0.25 U
PETROLEUM HYDROCARBONS												
Method NWTPH-G (µg/L)												
Gasoline	1,000	250 U	250 U	250 U	250 U	250 U	**4100**	250 U	**34,000**	250 U	250 U	250 U
Method NWTPH-Dx (µg/L)												
Diesel	500	100 U	100 U	100 U	100 U	100 U	**410**	100 U	**6200**	100 U	100 U	100 U
Motor Oil	500	200 U	200 U	200 U	200 U	100 U	**310**	100 U	5000 U	200 U	200 U	200 U
Creosote Oil	500	100 U	100 U	100 U	100 U	200 U	**2800**	200 U	**44,000**	**110**	**170**	**170**

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

	Cleanup Screening Levels For Groundwater (a)	MW-01D 10/25/2012 VP53C	MW-02D 10/24/2012 VP10A	MW-05D 10/25/2012 VP53E	CW-13 10/25/2012 VP53B
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) (µg/L)					
EPA Method 8270D / 8270D-SIM					
Naphthalene	4900	1.0 U	**43**	**1.3**	1.0 U
2-Methylnaphthalene		1.0 U	**11**	1.0 U	1.0 U
Acenaphthylene		1.0 U	**1.1**	1.0 U	1.0 U
Acenaphthene		1.0 U	**26**	**5.6**	**5.2**
Dibenzofuran		1.0 U	**11**	1.0 U	**2.5**
Fluorene		1.0 U	**13**	**1.3**	**2.0**
Pentachlorophenol	3	10 U	10 U	10 U	10 U
Phenanthrene		1.0 U	**8.3**	1.0 U	1.0 U
Carbazole		1.0 U	**9.0**	**2.2**	1.0 U
Anthracene		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
Pyrene	2600	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U
Chrysene		0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-cd)Pyrene		0.10 U	0.10 U	0.10 U	0.10 U
Dibenz(a,h)Anthracene		0.10 U	0.10 U	0.10 U	0.10 U
Benzo(g,h,i)Perylene		1.0 U	1.0 U	1.0 U	1.0 U
1-Methylnaphthalene		1.0 U	**19**	1.0 U	1.0 U
Total Benzofluoranthenes		0.20 U	0.20 U	0.20 U	0.20 U
cPAH TEQ (b)	0.1 (c)	ND	ND	ND	ND
cPAH TEQ (b) (Using 1/2 RL for ND)	0.1 (c)	0.076	0.076	0.076	0.076
PENTACHLOROPHENOL (µg/L)					
EPA Method 8041/8270C,D					
Pentachlorophenol	3	0.25 U	0.25 U	**2.2**	0.25 U
PETROLEUM HYDROCARBONS					
Method NWTPH-G (µg/L)					
Gasoline	1,000	250 U	**510**	250 U	250 U
Method NWTPH-Dx (µg/L)					
Diesel	500	100 U	**130**	100 U	100 U
Motor Oil	500	200 U	200 U	200 U	200 U
Creosote Oil	500	100 U	**910**	100 U	100 U

U = Indicates the compound was undetected at the given reporting limit.
Bold indicates detected compound.
Box indicates exceedance of screening level.

(a) Groundwater screening levels are MTCA Method B for marine surface water for cPAHs and PCP; MTCA Method A for TPH-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.

Note: Beginning with October 2010 data, lab no longer reports benzo(b)fluoranthenes or benzo(k)fluoranthenes, but does report total benzofluoranthenes.

ATTACHMENT 1

Laboratory Reports

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 10, 2012

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

RE: Project: Port of Olympia
ARI Job No: VP10

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 seven water samples and a trip blank in good condition on October 25, 2012.

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.

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

LANDAU ASSOCIATES

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

Chain-of-Custody Record

vpj9

Date 10/24/12
Page 1 of 1

Project Name Cascade Pole
Project No. 21039.060.061
Project Location/Event Port of Olympia / Dry Season
Sampler's Name Sarah Weeks, Sierra Mott, Jordan Thomas
Project Contact Chris Kimmel
Send Results To Chris Kimmel, Jessica Stone, Anne Halvorsen

Testing Parameters

Turnaround Time
☒ Standard
☐ Accelerated
☐ ______

Sample I.D.	Date	Time	Matrix	No. of Containers	NWTPH-Gx	NWTPH-Dx-(creosote)	PAHs + PCP (8270)	SIM PAHs/PCP (C)	PCP (8270)	PCP (8041)						
MW-02D-20121024	10/24/12	1319	H_2O	10	X	X	X	X	X	X						
PZ-18-20121024	10/24/12	1550	H_2O	10	X	X	X	X	X	X						
PZ-19-20121024	10/24/12	1449	H_2O	10	X	X	X	X	X	X						
PZ-30-20121024	10/24/12	1420	H_2O	10	X	X	X	X	X	X						
MW-05S-20121024	10/24/12	1426	H_2O	10	X	X	X	X	X	X						
LW-4R-20121024	10/24/12	1432	H_2O	10	X	X	X	X	X	X						
MW-02S-20121024	10/24/12	1326	H_2O	10	X	X	X	X	X	X						
Trip Blank	10/23/12	–	H_2O	2	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 - If results = ND, then and only then run PCP by 8041

Special Shipment/Handling or Storage Requirements: 4 coolers w/ ice

Method of Shipment: Delivery

Relinquished by	Received by	Relinquished by	Received by
Signature: [signature]	Signature: [signature]	Signature	Signature
Printed Name: Sarah Weeks	Printed Name: Taylor Streater	Printed Name	Printed Name
Company: Landau Associates, Inc	Company: Axf	Company	Company
Date 10/24/12 Time 1945	Date 10-25-12 Time 900	Date ______ Time ______	Date ______ Time ______

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

Rev 8/09

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VP10
Client: Landau Associates, Inc.
Project Event: 20139.060.061
Project Name: Cascade Pole

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-02D-20121024	VP10A	12-21136	Water	10/24/12 13:19	10/25/12 09:00
2.	PZ-18-20121024	VP10B	12-21137	Water	10/24/12 15:50	10/25/12 09:00
3.	PZ-19-20121024	VP10C	12-21138	Water	10/24/12 14:49	10/25/12 09:00
4.	PZ-30-20121024	VP10D	12-21139	Water	10/24/12 14:20	10/25/12 09:00
5.	MW-05S-20121024	VP10E	12-21140	Water	10/24/12 14:26	10/25/12 09:00
6.	LW-4R-20121024	VP10F	12-21141	Water	10/24/12 14:32	10/25/12 09:00
7.	MW-02S-20121024	VP10H	12-21142	Water	10/24/12 13:26	10/25/12 09:00
8.	Trip Blanks	VP10I	12-21143	Water	10/24/12	10/25/12 09:00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau Project Name: Cascade Pole

COC No(s): _____ NA Delivered by Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: VP10 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): 4.3 2.6 0.3 1.1 ____ ____

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: TB Date: 10-25-12 Time: 960

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	10-23-12	

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

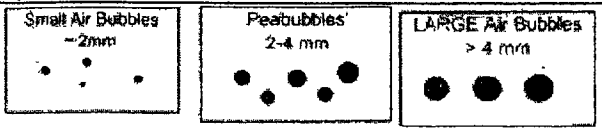
Samples Logged by: TB Date: 10-25-12 Time: 1125

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

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

Additional Notes, Discrepancies, & Resolutions:

By Date



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

Case Narrative

Project: 0021039.060.061
ARI Job No.: VP10
November 10, 2012
Page 1 of 2

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted seven water samples and a trip blank in good condition on October 25, 2012. The samples were received at cooler temperatures between 0.3 and 4.3°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 10/29/12. The samples were analyzed between 10/31/12 and 11/1/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate TBP is out of control high in association with the LCSD. The LCSD spike recoveries are in control and no further corrective action was taken.

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 10/26/12 and analyzed on 11/1/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: Are in control.

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 10/29/12 and analyzed on 11/04/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Case Narrative

Project: 0021039.060.061
ARI Job No.: VP10
November 10, 2012

Surrogates: The surrogate TBP is out of control high in association with the LCSD. The LCSD spike recoveries are in control and no further corrective action was taken.

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 10/26/12 - 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 10/29/12 and analyzed on 11/2/12 - 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.

Continuing Calibrations: Are in control.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: MW-02D-20121024**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VP10A
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 18:01
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	49.6%
d14-Dibenzo(a,h)anthracene	40.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: PZ-18-20121024
SAMPLE

Lab Sample ID: VP10B
LIMS ID: 12-21137
Matrix: Water
Data Release Authorized:
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 18:29
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	44.5%
d14-Dibenzo(a,h)anthracene	23.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: PZ-19-20121024**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VP10C
LIMS ID: 12-21138
Matrix: Water
Data Release Authorized: MW
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 18:57
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	42.9%
d14-Dibenzo(a,h)anthracene	35.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: PZ-30-20121024**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VP10D
LIMS ID: 12-21139
Matrix: Water
Data Release Authorized:
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 19:26
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	53.1%
d14-Dibenzo(a,h)anthracene	18.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: MW-05S-20121024**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VP10E
LIMS ID: 12-21140
Matrix: Water
Data Release Authorized: [signature]
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 19:54
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	48.3%
d14-Dibenzo(a,h)anthracene	22.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: LW-4R-20121024**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VP10F
LIMS ID: 12-21141
Matrix: Water
Data Release Authorized:
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 20:22
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	46.1%
d14-Dibenzo(a,h)anthracene	33.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS **Sample ID: MB-102612**
Extraction Method: SW3520C **METHOD BLANK**

Lab Sample ID: MB-102612
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized: MW
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted: 10/26/12
Date Analyzed: 11/01/12 14:42
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	46.0%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061

Client ID	MNP	DBA	TOT OUT
MB-102612	60.7%	46.0%	0
LCS-102612	59.0%	42.3%	0
LCSD-102612	61.7%	49.0%	0
MW-02D-20121024	49.6%	40.5%	0
PZ-18-20121024	44.5%	23.2%	0
PZ-19-20121024	42.9%	35.5%	0
PZ-30-20121024	53.1%	18.9%	0
MW-05S-20121024	48.3%	22.1%	0
LW-4R-20121024	46.1%	33.9%	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: 12-21136 to 12-21141

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-102612
LAB CONTROL SAMPLE

Lab Sample ID: LCS-102612
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/06/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 10/26/12

Date Analyzed LCS: 11/01/12 15:11
LCSD: 11/01/12 15:39
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	1.95	3.00	65.0%	1.96	3.00	65.3%	0.5%
Chrysene	2.22	3.00	74.0%	2.32	3.00	77.3%	4.4%
Benzo(a)pyrene	1.67	3.00	55.7%	1.77	3.00	59.0%	5.8%
Indeno(1,2,3-cd)pyrene	2.01	3.00	67.0%	2.22	3.00	74.0%	9.9%
Dibenz(a,h)anthracene	1.66	3.00	55.3%	2.12	3.00	70.7%	24.3%
Total Benzofluoranthenes	8.30	9.00	92.2%	8.21	9.00	91.2%	1.1%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	59.0%	61.7%
d14-Dibenzo(a,h)anthracene	42.3%	49.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
Page 1 of 1

Sample ID: MW-02D-20121024
SAMPLE

Lab Sample ID: VP10A
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 02:03
Instrument/Analyst: ECD1/YZ

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	99.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
Page 1 of 1

Sample ID: PZ-18-20121024
SAMPLE

Lab Sample ID: VP10B
LIMS ID: 12-21137
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 02:39
Instrument/Analyst: ECD1/YZ

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	82.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
Page 1 of 1

Sample ID: PZ-19-20121024
SAMPLE

Lab Sample ID: VP10C
LIMS ID: 12-21138
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 03:15
Instrument/Analyst: ECD1/YZ

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	90.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
Page 1 of 1

Sample ID: PZ-30-20121024
SAMPLE

Lab Sample ID: VP10D
LIMS ID: 12-21139
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 03:51
Instrument/Analyst: ECD1/YZ

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	86.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C

Sample ID: MW-05S-20121024
SAMPLE

Lab Sample ID: VP10E
LIMS ID: 12-21140
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 04:28
Instrument/Analyst: ECD1/YZ

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

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C

Sample ID: LW-4R-20121024
SAMPLE

Lab Sample ID: VP10F
LIMS ID: 12-21141
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 05:04
Instrument/Analyst: ECD1/YZ

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	84.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
Page 1 of 1

Sample ID: MW-02S-20121024
SAMPLE

Lab Sample ID: VP10H
LIMS ID: 12-21142
Matrix: Water
Data Release Authorized: 
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/04/12 05:40
Instrument/Analyst: ECD1/YZ

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	80.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C

Sample ID: MB-102912
METHOD BLANK

Lab Sample ID: MB-102912
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted: 10/29/12
Date Analyzed: 11/03/12 18:48
Instrument/Analyst: ECD1/YZ

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

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061

Client ID	TBP	TOT OUT
MB-102912	89.6%	0
LCS-102912	96.6%	0
LCSD-102912	104%*	1
MW-02D-20121024	99.6%	0
PZ-18-20121024	82.8%	0
PZ-19-20121024	90.4%	0
PZ-30-20121024	86.4%	0
MW-05S-20121024	92.8%	0
LW-4R-20121024	84.0%	0
MW-02S-20121024	80.8%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(41-98)	(26-113)

Prep Method: SW3510C
Log Number Range: 12-21136 to 12-21142

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: LCS-102912
LCS/LCSD

Lab Sample ID: LCS-102912
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/09/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted LCS/LCSD: 10/29/12

Date Analyzed LCS: 11/03/12 19:24
LCSD: 11/03/12 20:00
Instrument/Analyst LCS: ECD1/YZ
LCSD: ECD1/YZ

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	2.40	2.50	96.0%	2.46	2.50	98.4%	2.5%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	96.6%	104%

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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-02D-20121024
SAMPLE

Lab Sample ID: VP10A
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 10/31/12 23:39
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**	**43**
91-57-6	**2-Methylnaphthalene**	**1.0**	**11**
208-96-8	**Acenaphthylene**	**1.0**	**1.1**
83-32-9	**Acenaphthene**	**1.0**	**26**
132-64-9	**Dibenzofuran**	**1.0**	**11**
86-73-7	**Fluorene**	**1.0**	**13**
87-86-5	Pentachlorophenol	10	< 10 U
85-01-8	**Phenanthrene**	**1.0**	**8.3**
86-74-8	**Carbazole**	**1.0**	**9.0**
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**	**19**
TOTBFA	Total Benzofluoranthenes	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	49.2%
d14-p-Terphenyl	73.2%
2,4,6-Tribromophenol	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: PZ-18-20121024
SAMPLE

Lab Sample ID: VP10B
LIMS ID: 12-21137
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/01/12 19:22
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	43.2%
d14-p-Terphenyl	56.4%
2,4,6-Tribromophenol	77.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: PZ-19-20121024
SAMPLE

Lab Sample ID: VP10C
LIMS ID: 12-21138
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/01/12 00:48
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	50.8%
d14-p-Terphenyl	77.6%
2,4,6-Tribromophenol	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: PZ-30-20121024
SAMPLE

Lab Sample ID: VP10D
LIMS ID: 12-21139
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/01/12 01:22
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**	**10**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	10	< 10 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**	**1.2**
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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	68.4%
d14-p-Terphenyl	62.8%
2,4,6-Tribromophenol	118%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
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Sample ID: MW-05S-20121024
SAMPLE

Lab Sample ID: VP10E
LIMS ID: 12-21140
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/01/12 01:56
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	< 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**	**8.2**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	10	< 10 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**
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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	50.8%
d14-p-Terphenyl	59.6%
2,4,6-Tribromophenol	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
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Sample ID: LW-4R-20121024
SAMPLE

Lab Sample ID: VP10F
LIMS ID: 12-21141
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/01/12 14:49
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	57.6%
d14-p-Terphenyl	86.8%
2,4,6-Tribromophenol	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-02S-20121024
SAMPLE

Lab Sample ID: VP10H
LIMS ID: 12-21142
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted: 10/29/12
Date Analyzed: 11/01/12 15:23
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	66.0%
d14-p-Terphenyl	66.8%
2,4,6-Tribromophenol	95.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: MB-102912**
Extraction Method: SW3520C **METHOD BLANK**

Lab Sample ID: MB-102912
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted: 10/29/12
Date Analyzed: 10/31/12 20:14
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	59.6%
d14-p-Terphenyl	76.0%
2,4,6-Tribromophenol	83.5%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061

Client ID	FBP	TPH	TBP	TOT OUT
MB-102912	59.6%	76.0%	83.5%	0
LCS-102912	73.6%	85.2%	123%	0
LCSD-102912	98.4%	113%	168%*	1
MW-02D-20121024	49.2%	73.2%	101%	0
PZ-18-20121024	43.2%	56.4%	77.1%	0
PZ-19-20121024	50.8%	77.6%	101%	0
PZ-30-20121024	68.4%	62.8%	118%	0
MW-05S-20121024	50.8%	59.6%	102%	0
LW-4R-20121024	57.6%	86.8%	104%	0
MW-02S-20121024	66.0%	66.8%	95.5%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(51-100)	(38-100)
(TPH) = d14-p-Terphenyl	(54-117)	(27-122)
(TBP) = 2,4,6-Tribromophenol	(46-125)	(31-128)

Prep Method: SW3520C
Log Number Range: 12-21136 to 12-21142

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LCS-102912
LCS/LCSD

Lab Sample ID: LCS-102912
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/02/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted LCS/LCSD: 10/29/12

Date Analyzed LCS: 10/31/12 20:49
LCSD: 10/31/12 21:23
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	15.0	25.0	60.0%	14.9	25.0	59.6%	0.7%
2-Methylnaphthalene	14.7	25.0	58.8%	14.7	25.0	58.8%	0.0%
Acenaphthylene	18.2	25.0	72.8%	18.0	25.0	72.0%	1.1%
Acenaphthene	17.8	25.0	71.2%	17.7	25.0	70.8%	0.6%
Dibenzofuran	17.1	25.0	68.4%	17.0	25.0	68.0%	0.6%
Fluorene	19.6	25.0	78.4%	19.5	25.0	78.0%	0.5%
Pentachlorophenol	67.3	75.0	89.7%	69.6	75.0	92.8%	3.4%
Phenanthrene	19.4	25.0	77.6%	19.5	25.0	78.0%	0.5%
Carbazole	22.1	25.0	88.4%	21.7	25.0	86.8%	1.8%
Anthracene	18.5	25.0	74.0%	18.5	25.0	74.0%	0.0%
Fluoranthene	22.4	25.0	89.6%	21.7	25.0	86.8%	3.2%
Pyrene	17.4	25.0	69.6%	18.0	25.0	72.0%	3.4%
Benzo(a)anthracene	19.3	25.0	77.2%	19.1	25.0	76.4%	1.0%
Chrysene	19.4	25.0	77.6%	19.8	25.0	79.2%	2.0%
Benzo(a)pyrene	17.8	25.0	71.2%	17.5	25.0	70.0%	1.7%
Indeno(1,2,3-cd)pyrene	10.2	25.0	40.8%	10.9	25.0	43.6%	6.6%
Dibenz(a,h)anthracene	10.9	25.0	43.6%	11.8	25.0	47.2%	7.9%
Benzo(g,h,i)perylene	8.9	25.0	35.6%	10.1	25.0	40.4%	12.6%
1-Methylnaphthalene	20.6	25.0	82.4%	20.6	25.0	82.4%	0.0%
Total Benzofluoranthenes	42.5	50.0	85.0%	41.4	50.0	82.8%	2.6%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	73.6%	98.4%
d14-p-Terphenyl	85.2%	113%
2,4,6-Tribromophenol	123%	168%

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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 11/12/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-102612	Method Blank	10/26/12	1.0	Gasoline	< 250 U
12-21136		PID1		HC ID	---
				Trifluorotoluene	99.1%
				Bromobenzene	97.9%
VP10A	MW-02D-20121024	10/26/12	1.0	**Gasoline**	**510**
12-21136		PID1		HC ID	GRO
				Trifluorotoluene	98.5%
				Bromobenzene	99.4%
VP10B	PZ-18-20121024	10/26/12	1.0	Gasoline	< 250 U
12-21137		PID1		HC ID	---
				Trifluorotoluene	96.5%
				Bromobenzene	99.4%
VP10C	PZ-19-20121024	10/26/12	1.0	Gasoline	< 250 U
12-21138		PID1		HC ID	---
				Trifluorotoluene	96.5%
				Bromobenzene	100%
VP10D	PZ-30-20121024	10/26/12	1.0	Gasoline	< 250 U
12-21139		PID1		HC ID	---
				Trifluorotoluene	99.1%
				Bromobenzene	101%
VP10E	MW-05S-20121024	10/26/12	1.0	Gasoline	< 250 U
12-21140		PID1		HC ID	---
				Trifluorotoluene	96.5%
				Bromobenzene	99.5%
VP10F	LW-4R-20121024	10/26/12	1.0	Gasoline	< 250 U
12-21141		PID1		HC ID	---
				Trifluorotoluene	93.8%
				Bromobenzene	98.9%
VP10H	MW-02S-20121024	10/26/12	1.0	Gasoline	< 250 U
12-21142		PID1		HC ID	---
				Trifluorotoluene	91.8%
				Bromobenzene	94.8%
VP10I	Trip Blanks	10/26/12	1.0	Gasoline	< 250 U
12-21143		PID1		HC ID	---
				Trifluorotoluene	98.3%
				Bromobenzene	98.5%

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: VP10
Matrix: Water

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061

Client ID	TFT	BBZ	TOT OUT
MB-102612	99.1%	97.9%	0
LCS-102612	103%	99.5%	0
LCSD-102612	104%	102%	0
MW-02D-20121024	98.5%	99.4%	0
PZ-18-20121024	96.5%	99.4%	0
PZ-19-20121024	96.5%	100%	0
PZ-30-20121024	99.1%	101%	0
MW-05S-20121024	96.5%	99.5%	0
LW-4R-20121024	93.8%	98.9%	0
MW-02S-20121024	91.8%	94.8%	0
Trip Blanks	98.3%	98.5%	0

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

Log Number Range: 12-21136 to 12-21143

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-102612
LAB CONTROL SAMPLE

Lab Sample ID: LCS-102612
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/12/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 10/26/12 11:11
LCSD: 10/26/12 11:40
Instrument/Analyst LCS: PID1/JLW
LCSD: PID1/JLW

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	1100	1000	110%	1040	1000	104%	5.6%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	103%	104%
Bromobenzene	99.5%	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID-Silica and Acid Cleaned — QC Report No: VP10-Landau Associates, Inc.
Extraction Method: — Project: Cascade Pole
Page 1 of 1 — 20139.060.061

Matrix: Water
Data Release Authorized:
Reported: 11/12/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV	DL	Range/Surrogate	RL	Result
MB-102912	Method Blank	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21136	HC ID: ---		FID4A	1.0		Motor Oil Range	200	< 200 U
						Creosote Range	100	< 100 U
						o-Terphenyl		86.4%
VP10A	MW-02D-20121024	10/29/12	11/02/12	1.00		**Diesel Range**	**100**	**130**
12-21136	HC ID: **CREOSOTE**		FID4A	1.0		Motor Oil Range	200	< 200 U
						Creosote Range	**100**	**910**
						o-Terphenyl		80.2%
VP10B	PZ-18-20121024	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21137	HC ID: ---		FID4A	1.0		Motor Oil Range	200	< 200 U
						Creosote Range	100	< 100 U
						o-Terphenyl		84.1%
VP10C	PZ-19-20121024	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21138	HC ID: ---		FID4A	1.0		Creosote Range	200	< 200 U
						Motor Oil Range	100	< 100 U
						o-Terphenyl		91.3%
VP10D	PZ-30-20121024	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21139	HC ID: **DRO**		FID4A	1.0		Motor Oil Range	200	< 200 U
						Creosote Range	**100**	**170**
						o-Terphenyl		89.2%
VP10E	MW-05S-20121024	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21140	HC ID: **DRO**		FID4A	1.0		Motor Oil Range	200	< 200 U
						Creosote Range	**100**	**170**
						o-Terphenyl		89.8%
VP10F	LW-4R-20121024	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21141	HC ID: ---		FID4A	1.0		Creosote Range	200	< 200 U
						Motor Oil Range	100	< 100 U
						o-Terphenyl		83.6%
VP10H	MW-02S-20121024	10/29/12	11/02/12	1.00		Diesel Range	100	< 100 U
12-21142	HC ID: **DRO**		FID4A	1.0		Motor Oil Range	200	< 200 U
						Creosote Range	**100**	**110**
						o-Terphenyl		86.9%

Reported in ug/L (ppb)

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

Diesel range quantitation on total peaks in the range from C12 to C24.
Motor Oil range quantitation on total peaks in the range from C24 to C38.
Creosote range 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

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-102912**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-102912
LIMS ID: 12-21136
Matrix: Water
Data Release Authorized:
Reported: 11/12/12

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061
Date Sampled: 10/24/12
Date Received: 10/25/12

Date Extracted LCS/LCSD: 10/29/12
Date Analyzed LCS: 11/02/12 00:52
LCSD: 11/02/12 01:13
Instrument/Analyst LCS: FID/JGR
LCSD: FID/JGR

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	2290	3000	76.3%	2320	3000	77.3%	1.3%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	71.6%	89.6%

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

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP10-Landau Associates, Inc.
Project: Cascade Pole
20139.060.061

Client ID	OTER	TOT OUT
MB-102912	86.4%	0
LCS-102912	71.6%	0
LCSD-102912	89.6%	0
MW-02D-20121024	80.2%	0
PZ-18-20121024	84.1%	0
PZ-19-20121024	91.3%	0
PZ-30-20121024	89.2%	0
MW-05S-20121024	89.8%	0
LW-4R-20121024	83.6%	0
MW-02S-20121024	86.9%	0

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

Prep Method: SW3510C
Log Number Range: 12-21136 to 12-21142

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: VP10
Matrix: Water
Project: Cascade Pole
Date Received: 10/25/12
20139.060.061

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
12-21136-102912MB1	Method Blank	500 mL	1.00 mL	10/29/12
12-21136-102912LCS1	Lab Control	500 mL	1.00 mL	10/29/12
12-21136-102912LCSD1	Lab Control Dup	500 mL	1.00 mL	10/29/12
12-21136-VP10A	MW-02D-20121024	500 mL	1.00 mL	10/29/12
12-21137-VP10B	PZ-18-20121024	500 mL	1.00 mL	10/29/12
12-21138-VP10C	PZ-19-20121024	500 mL	1.00 mL	10/29/12
12-21139-VP10D	PZ-30-20121024	500 mL	1.00 mL	10/29/12
12-21140-VP10E	MW-05S-20121024	500 mL	1.00 mL	10/29/12
12-21141-VP10F	LW-4R-20121024	500 mL	1.00 mL	10/29/12
12-21142-VP10H	MW-02S-20121024	500 mL	1.00 mL	10/29/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

November 14, 2012

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

RE: Project: Port of Olympia
ARI Job No: VP53

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 eight water samples and a trip blank in good condition on October 26, 2012.

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.

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

LANDAU ASSOCIATES

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

Chain-of-Custody Record

VY53

Date 10/25/12
Page 1 of 1

Project Name Port of Olympia Project No. 21031.006.001
Project Location/Event Cascade Pole, Dry Season
Sampler's Name Sarah Wicks, Steven Mott
Project Contact Chris Kimmel
Send Results To Chris Kimmel Landau Associates

Turnaround Time
☒ Standard
☐ Accelerated
☐ _____

Testing Parameters

Sample I.D.	Date	Time	Matrix	No. of Containers	Observations/Comments
PZ-15-20121025	10/25/12	1243	H2O	10	
CW-13-20121025		1407			
MW-01D-20121025		1541			
MW-01S-20121025		1457			
MW-05D-20121025		1403			
PZ-12-20121025		2[illegible]			
Trip Blank	10/25/12	—		2	
PZ-17-20121026	10/26/12	0507		10	
LW-3-20121026	10/26/12	0609		10	

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. If results = ND, then and only then run PCP by 8041. HOLD Sample LW-3-20121026 Do not run - wait for communication from project manager

Oh 10 run 10/26/12

Special Shipment/Handling or Storage Requirements 4 coolers + Ice

Method of Shipment Courier

Relinquished by	Received by	Relinquished by	Received by
Signature [illegible]	Signature Julian Cooley	Signature Julian Cooley	Signature [illegible]
Printed Name Steven Mott	Printed Name Julian Cooley	Printed Name Julian Cooley	Printed Name [illegible]
Company Landau Associates	Company Landau Associates	Company Landau Associates	Company [illegible]
Date 10/26/12 Time 0932	Date 10/26/12 Time 09:32	Date 10/26/12 Time 2:55pm	Date 10/26/12 Time 1658

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 Tacoma | Edmonds Project Name: Port of Olympia

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: UP53 Tracking No: _____ NA

Preliminary Examination Phase:

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

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)..... 3.8 3.5 3.2 3.8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952

Cooler Accepted by: _____ Date: 10-26-12 Time: 1658

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 10-23-12

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

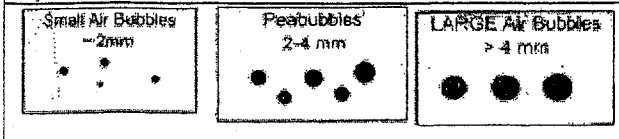
Samples Logged by: TS Date: 10-27-12 Time: 1138

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

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

Additional Notes, Discrepancies, & Resolutions:

By: Date:



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

LANDAU ASSOCIATES

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

Date 10/25/12
Page 1 of 1

Chain-of-Custody Record

Project Name Port of Olympia Project No. 21039.060.061
Project Location/Event Cascade Pole, Dry Season
Sampler's Name Sarah Weeks, Sierra Mott
Project Contact Chris Kimmel
Send Results To Chris Kimmel, Jessica Stone, Anne Halvorsen

Turnaround Time
☒ Standard
☐ Accelerated

Testing Parameters

Sample I.D.	Date	Time	Matrix	No. of Containers	TPH-Dx	TPH-Dx (acid/silica)	cPAHs (8270)	cPAHs SIM	PCP (8270)	PCP (8041)
PZ-13-20121025	10/25/12	1243	H2O	10	X	X	X	X	X	X
CW-13-20121025	|	1407	|	|	X	X	X	X	X	X
MW01D-20121025	|	1541	|	|	X	X	X	X	X	X
MW-01S-20121025	|	1637	|	|	X	X	X	X	X	X
MW-05D-20121025	|	1408	|	|	X	X	X	X	X	X
PZ-12-20121025	|	1254	|	|	X	X	X	X	X	X
Trip Blank	10/23/12	—		+2	X					
PZ-17-20121026	10/26/12	0807		10	X	X	X	X	X	X
LW-3-20121026	10/26/12	0909		10	X	X	X	X	X	X

REVISION: Run LW-3-20121026 Allow sample to settle 24hrs prior to extraction, collect aliquot from clear portion SW 10/29/12

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. If results = ND then and only then run PCP by 8041
HOLD sample LW-3-20121026 before run [illegible] for confirmation from project manager

Special Shipment/Handling or Storage Requirements 4 coolers + Ice

Method of Shipment Courier

Relinquished by	Received by	Relinquished by	Received by
Signature [signature]	Signature [signature]	Signature [signature]	Signature [signature]
Printed Name Sierra Mott	Printed Name Julianna Conley	Printed Name Julianna Conley	Printed Name [illegible]
Company Landau Associates	Company Landau Associates	Company Landau Associates	Company [illegible]
Date ~~10/25/12~~ 10/26/12 Time 0932	Date 10/26/12 Time 12:32	Date 10/26/12 Time 4:56pm	Date [illegible] Time 1658

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

Rev 8/09

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VP53
Client: Landau Associates, Inc.
Project Event: 20139.060.061
Project Name: Port of Olympia

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	PZ-13-20121025	VP53A	12-21327	Water	10/25/12 12:43	10/26/12 16:58
2.	CW-13-20121025	VP53B	12-21328	Water	10/25/12 14:07	10/26/12 16:58
3.	MW-01D-20121025	VP53C	12-21329	Water	10/25/12 15:41	10/26/12 16:58
4.	MW-01S-20121025	VP53D	12-21330	Water	10/25/12 16:37	10/26/12 16:58
5.	MW-05D-20121025	VP53E	12-21331	Water	10/25/12 14:08	10/26/12 16:58
6.	PZ-12-20121025	VP53F	12-21332	Water	10/25/12 12:54	10/26/12 16:58
7.	PZ-17-20121026	VP53G	12-21333	Water	10/26/12 05:07	10/26/12 16:58
8.	LW-3-20121026	VP53H	12-21334	Water	10/26/12 06:09	10/26/12 16:58
9.	Trip Blanks	VP53I	12-21335	Water	10/25/12	10/26/12 16:58

Case Narrative

Project: 0021039.060.061
ARI Job No.: VP53
November 14, 2012

Sample Receipt

Please find enclosed the original *Chain of Custody (COC)* record and analytical results for the project referenced above. Analytical Resources, Inc. accepted eight water samples and a trip blank in good condition on October 26, 2012. The samples were received at cooler temperatures between 3.2 and 3.8°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 10/31/12. The samples were analyzed between 11/5/12 and 11/6/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: Are 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 10/31/12 and analyzed on 11/8/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Surrogates: The surrogate MNP is out of control low in association with sample MW-01S-20121025. All other surrogate recoveries are in control and no further corrective action was taken.

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 10/31/12 and analyzed on 11/09/12 - within the method recommended holding time.

Samples: There were no anomalies associated with these samples.

Case Narrative

Project: 0021039.060.061
ARI Job No.: VP53
November 14, 2012

Surrogates: The surrogate TBP is out of control high in association with the LCSD. The LCSD spike recoveries are in control and no further corrective action was taken.

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 10/29/12 - 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 10/30/12 and analyzed on 11/1/12 and 11/2/12 - 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.

Continuing Calibrations: Are in control.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: PZ-13-20121025
SAMPLE

Lab Sample ID: VP53A
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 14:10
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	65.0%
d14-Dibenzo(a,h)anthracene	47.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: CW-13-20121025
SAMPLE

Lab Sample ID: VP53B
LIMS ID: 12-21328
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 15:42
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	61.7%
d14-Dibenzo(a,h)anthracene	50.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: MW-01D-20121025
SAMPLE

Lab Sample ID: VP53C
LIMS ID: 12-21329
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 16:10
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.3%
d14-Dibenzo(a,h)anthracene	49.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-01S-20121025
SAMPLE

Lab Sample ID: VP53D
LIMS ID: 12-21330
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 16:38
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**	**2.5**
218-01-9	**Chrysene**	**0.10**	**2.4**
50-32-8	**Benzo(a)pyrene**	**0.10**	**0.76**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**0.10**	**0.11**
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
TOTBFA	**Total Benzofluoranthenes**	**0.20**	**1.5**

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	23.0%
d14-Dibenzo(a,h)anthracene	30.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: MW-05D-20121025
SAMPLE

Lab Sample ID: VP53E
LIMS ID: 12-21331
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 17:07
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.7%
d14-Dibenzo(a,h)anthracene	54.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: PZ-12-20121025
SAMPLE

Lab Sample ID: VP53F
LIMS ID: 12-21332
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 17:35
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	60.7%
d14-Dibenzo(a,h)anthracene	51.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: PZ-17-20121026
SAMPLE

Lab Sample ID: VP53G
LIMS ID: 12-21333
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/26/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 18:03
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.3%
d14-Dibenzo(a,h)anthracene	51.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: LW-3-20121026
SAMPLE

Lab Sample ID: VP53H
LIMS ID: 12-21334
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/26/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 18:32
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.0%
d14-Dibenzo(a,h)anthracene	23.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Extraction Method: SW3520C

Sample ID: MB-103112
METHOD BLANK

Lab Sample ID: MB-103112
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted: 10/31/12
Date Analyzed: 11/08/12 12:45
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	0.20	< 0.20 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	54.7%
d14-Dibenzo(a,h)anthracene	50.3%

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061

Client ID	MNP	DBA	TOT OUT
MB-103112	54.7%	50.3%	0
LCS-103112	57.0%	54.7%	0
LCSD-103112	50.7%	61.0%	0
PZ-13-20121025	65.0%	47.3%	0
CW-13-20121025	61.7%	50.0%	0
MW-01D-20121025	58.3%	49.0%	0
MW-01S-20121025	23.0%*	30.3%	1
MW-05D-20121025	58.7%	54.7%	0
PZ-12-20121025	60.7%	51.0%	0
PZ-17-20121026	68.3%	51.3%	0
LW-3-20121026	63.0%	23.7%	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: 12-21327 to 12-21334

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-103112
LAB CONTROL SAMPLE

Lab Sample ID: LCS-103112
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 10/31/12

Date Analyzed LCS: 11/08/12 13:13
LCSD: 11/08/12 13:42
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	2.55	3.00	85.0%	2.75	3.00	91.7%	7.5%
Chrysene	2.84	3.00	94.7%	2.88	3.00	96.0%	1.4%
Benzo(a)pyrene	1.90	3.00	63.3%	2.24	3.00	74.7%	16.4%
Indeno(1,2,3-cd)pyrene	2.31	3.00	77.0%	2.47	3.00	82.3%	6.7%
Dibenz(a,h)anthracene	2.25	3.00	75.0%	2.28	3.00	76.0%	1.3%
Total Benzofluoranthenes	9.19	9.00	102%	9.06	9.00	101%	1.4%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	57.0%	50.7%
d14-Dibenzo(a,h)anthracene	54.7%	61.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-102912 12-21327	Method Blank	10/29/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 97.9% 99.0%
VP53A 12-21327	PZ-13-20121025	10/29/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 97.9% 99.2%
VP53B 12-21328	CW-13-20121025	10/29/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 96.1% 97.8%
VP53C 12-21329	MW-01D-20121025	10/29/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 95.5% 96.9%
VP53D 12-21330	MW-01S-20121025	10/29/12 PID1	1.0	**Gasoline** HC ID Trifluorotoluene Bromobenzene	**19000 E** GAS/GRO 97.1% 98.3%
VP53D DL 12-21330	MW-01S-20121025	10/30/12 PID2	10	**Gasoline** HC ID Trifluorotoluene Bromobenzene	**34000** GAS/GRO 97.6% 97.9%
MB-110612 12-21331	Method Blank	11/06/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 96.1% 99.3%
VP53E 12-21331	MW-05D-20121025	11/06/12 PID1	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 99.6% 99.7%
MB-103012 12-21332	Method Blank	10/30/12 PID2	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 97.7% 97.8%
VP53F 12-21332	PZ-12-20121025	10/30/12 PID2	1.0	Gasoline HC ID Trifluorotoluene Bromobenzene	< 250 U --- 96.6% 95.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: 10/26/12
Date Received: 10/26/12

ARI ID	Client ID	Analysis Date	DL	Range	Result
VP53G	PZ-17-20121026	10/30/12	1.0	Gasoline	< 250 U
12-21333		PID2		HC ID	---
				Trifluorotoluene	95.7%
				Bromobenzene	94.4%
VP53H	LW-3-20121026	10/30/12	1.0	**Gasoline**	**4100**
12-21334		PID1		HC ID	TOLUENE
				Trifluorotoluene	96.7%
				Bromobenzene	101%
VP53I	Trip Blanks	10/29/12	1.0	Gasoline	< 250 U
12-21335		PID1		HC ID	---
				Trifluorotoluene	96.7%
				Bromobenzene	97.2%

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: VP53
Matrix: Water

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061

Client ID	TFT	BBZ	TOT OUT
MB-102912	97.9%	99.0%	0
LCS-102912	101%	99.7%	0
LCSD-102912	104%	103%	0
PZ-13-20121025	97.9%	99.2%	0
CW-13-20121025	96.1%	97.8%	0
MW-01D-20121025	95.5%	96.9%	0
MW-01S-20121025	97.1%	98.3%	0
MW-01S-20121025 DL	97.6%	97.9%	0
MB-110612	96.1%	99.3%	0
LCS-110612	99.5%	97.9%	0
LCSD-110612	101%	100%	0
MW-05D-20121025	99.6%	99.7%	0
MB-103012	97.7%	97.8%	0
LCS-103012	100%	98.2%	0
LCSD-103012	101%	98.2%	0
PZ-12-20121025	96.6%	95.5%	0
PZ-17-20121026	95.7%	94.4%	0
LW-3-20121026	96.7%	101%	0
Trip Blanks	96.7%	97.2%	0

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

Log Number Range: 12-21327 to 12-21335

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-102912
LAB CONTROL SAMPLE

Lab Sample ID: LCS-102912
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 10/29/12 13:25
LCSD: 10/29/12 13:55
Instrument/Analyst LCS: PID1/PKC
LCSD: PID1/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	1070	1000	107%	1060	1000	106%	0.9%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	101%	104%
Bromobenzene	99.7%	103%

ANALYTICAL RESOURCES INCORPORATED

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

Sample ID: LCS-103012
LAB CONTROL SAMPLE

Lab Sample ID: LCS-103012
LIMS ID: 12-21332
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 10/30/12 10:48
LCSD: 10/30/12 11:16
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	1100	1000	110%	1070	1000	107%	2.8%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	100%	101%
Bromobenzene	98.2%	98.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG

Sample ID: LCS-110612
LAB CONTROL SAMPLE

Lab Sample ID: LCS-110612
LIMS ID: 12-21331
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
Event: 20139.060.061
Date Sampled: NA
Date Received: NA

Date Analyzed LCS: 11/06/12 11:21
LCSD: 11/06/12 11:50
Instrument/Analyst LCS: PID1/PKC
LCSD: PID1/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	1020	1000	102%	950	1000	95.0%	7.1%

Reported in ug/L (ppb)

RPD calculated using sample concentrations per SW846.

TPHG Surrogate Recovery

	LCS	LCSD
Trifluorotoluene	99.5%	101%
Bromobenzene	97.9%	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Extraction Method:

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061

Matrix: Water
Data Release Authorized: MW
Reported: 11/05/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	RL	Result
MB-103012	Method Blank	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21327	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		84.6%
PZ-13-20121	PZ-13-20121025	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21327	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		80.8%
CW-13-20121	CW-13-20121025	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21328	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		84.4%
MW-01D-2012	MW-01D-20121025	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21329	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		85.6%
MW-01S-2012	MW-01S-20121025	10/30/12	11/02/12	1.00	**Diesel Range**	**2500**	**6200**
12-21330	HC ID: **CREOSOTE**		FID4A	25	Motor Oil Range	5000	< 5000 U
					Creosote Range	**2500**	**44000**
					o-Terphenyl		D
MW-05D-2012	MW-05D-20121025	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21331	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		82.2%
PZ-12-20121	PZ-12-20121025	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21332	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		89.3%
PZ-17-20121	PZ-17-20121026	10/30/12	11/01/12	1.00	Diesel Range	100	< 100 U
12-21333	HC ID: ---		FID4A	1.0	Motor Oil Range	200	< 200 U
					Creosote Range	100	< 100 U
					o-Terphenyl		87.5%
LW-3-201210	LW-3-20121026	10/30/12	11/02/12	1.00	**Diesel Range**	**100**	**410**
12-21334	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil Range**	**200**	**310**
					Creosote Range	**100**	**2800**
					o-Terphenyl		88.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Extraction Method:

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061

Matrix: Water
Data Release Authorized: MW
Reported: 11/05/12

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

Reported in ug/L (ppb)

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

Diesel range quantitation on total peaks in the range from C12 to C24.
Motor Oil range quantitation on total peaks in the range from C24 to C38.
Creosote range 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: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061

Client ID	OTER	TOT OUT
MB-103012	84.6%	0
LCS-103012	82.3%	0
LCSD-103012	80.9%	0
PZ-13-20121025	80.8%	0
CW-13-20121025	84.4%	0
MW-01D-20121025	85.6%	0
MW-01S-20121025	D	0
MW-05D-20121025	82.2%	0
PZ-12-20121025	89.3%	0
PZ-17-20121026	87.5%	0
LW-3-20121026	88.1%	0

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

Prep Method: SW3510C
Log Number Range: 12-21327 to 12-21334

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-103012**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-103012
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted LCS/LCSD: 10/30/12

Date Analyzed LCS: 11/01/12 19:50
LCSD: 11/01/12 20:12
Instrument/Analyst LCS: FID/JGR
LCSD: FID/JGR

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	2070	3000	69.0%	2100	3000	70.0%	1.4%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	82.3%	80.9%

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

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

ARI Job: VP53
Matrix: Water Project: Port of Olympia
Date Received: 10/26/12 20139.060.061

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
12-21327-103012MB1	Method Blank	500 mL	1.00 mL	10/30/12
12-21327-103012LCS1	Lab Control	500 mL	1.00 mL	10/30/12
12-21327-103012LCSD1	Lab Control Dup	500 mL	1.00 mL	10/30/12
12-21327-VP53A	PZ-13-20121025	500 mL	1.00 mL	10/30/12
12-21328-VP53B	CW-13-20121025	500 mL	1.00 mL	10/30/12
12-21329-VP53C	MW-01D-20121025	500 mL	1.00 mL	10/30/12
12-21330-VP53D	MW-01S-20121025	500 mL	1.00 mL	10/30/12
12-21331-VP53E	MW-05D-20121025	500 mL	1.00 mL	10/30/12
12-21332-VP53F	PZ-12-20121025	500 mL	1.00 mL	10/30/12
12-21333-VP53G	PZ-17-20121026	500 mL	1.00 mL	10/30/12
12-21334-VP53H	LW-3-20121026	500 mL	1.00 mL	10/30/12

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: PZ-13-20121025
SAMPLE

Lab Sample ID: VP53A
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/05/12 18:43
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	84.0%
d14-p-Terphenyl	90.8%
2,4,6-Tribromophenol	98.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: CW-13-20121025
SAMPLE

Lab Sample ID: VP53B
LIMS ID: 12-21328
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/05/12 23:49
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**	**5.2**
132-64-9	**Dibenzofuran**	**1.0**	**2.5**
86-73-7	**Fluorene**	**1.0**	**2.0**
87-86-5	Pentachlorophenol	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	65.2%
d14-p-Terphenyl	80.0%
2,4,6-Tribromophenol	86.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-01D-20121025
SAMPLE

Lab Sample ID: VP53C
LIMS ID: 12-21329
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 00:23
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	54.0%
d14-p-Terphenyl	64.4%
2,4,6-Tribromophenol	64.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-01S-20121025
SAMPLE

Lab Sample ID: VP53D
LIMS ID: 12-21330
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 00:57
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**	**970 ES**
91-57-6	**2-Methylnaphthalene**	**3.0**	**560 ES**
208-96-8	**Acenaphthylene**	**3.0**	**10**
83-32-9	**Acenaphthene**	**3.0**	**220**
132-64-9	**Dibenzofuran**	**3.0**	**110**
86-73-7	**Fluorene**	**3.0**	**90**
87-86-5	**Pentachlorophenol**	**30**	**4,700 ES**
85-01-8	**Phenanthrene**	**3.0**	**82**
86-74-8	**Carbazole**	**3.0**	**52**
120-12-7	**Anthracene**	**3.0**	**21**
206-44-0	**Fluoranthene**	**3.0**	**18**
129-00-0	**Pyrene**	**3.0**	**8.9**
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**	**530 ES**
TOTBFA	Total Benzofluoranthenes	15	< 15 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery	
2-Fluorobiphenyl	94.7%
d14-p-Terphenyl	68.9%
2,4,6-Tribromophenol	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-01S-20121025
DILUTION

Lab Sample ID: VP53D
LIMS ID: 12-21330
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 12:42
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**	**4,600**
91-57-6	**2-Methylnaphthalene**	**100**	**710**
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	**100**	**240**
132-64-9	Dibenzofuran	100	< 100 U
86-73-7	Fluorene	100	< 100 U
87-86-5	**Pentachlorophenol**	**1,000**	**4,300**
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**	**560**
TOTBFA	Total Benzofluoranthenes	500	< 500 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
Extraction Method: SW3520C
Page 1 of 1

Sample ID: MW-05D-20121025
SAMPLE

Lab Sample ID: VP53E
LIMS ID: 12-21331
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 01:31
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**	**1.3**
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**	**5.6**
132-64-9	Dibenzofuran	1.0	< 1.0 U
86-73-7	**Fluorene**	**1.0**	**1.3**
87-86-5	Pentachlorophenol	10	< 10 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	**Carbazole**	**1.0**	**2.2**
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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	72.8%
d14-p-Terphenyl	90.8%
2,4,6-Tribromophenol	86.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: PZ-12-20121025
SAMPLE

Lab Sample ID: VP53F
LIMS ID: 12-21332
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 02:05
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	60.8%
d14-p-Terphenyl	72.4%
2,4,6-Tribromophenol	77.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: PZ-17-20121026
SAMPLE

Lab Sample ID: VP53G
LIMS ID: 12-21333
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/26/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 02:39
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	< 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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	56.8%
d14-p-Terphenyl	71.2%
2,4,6-Tribromophenol	79.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 1

Sample ID: LW-3-20121026
SAMPLE

Lab Sample ID: VP53H
LIMS ID: 12-21334
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/26/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/06/12 03:13
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	61.2%
d14-p-Terphenyl	64.8%
2,4,6-Tribromophenol	88.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: MB-103112
METHOD BLANK

Lab Sample ID: MB-103112
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized: MW
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted: 10/31/12
Date Analyzed: 11/05/12 17:01
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	10	< 10 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	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

2-Fluorobiphenyl	72.0%
d14-p-Terphenyl	87.6%
2,4,6-Tribromophenol	77.3%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061

Client ID	FBP	TPH	TBP	TOT OUT
MB-102112	72.0%	87.6%	77.3%	0
LCS-102112	77.2%	92.4%	97.9%	0
LCSD-102112	77.6%	93.6%	101%	0
PZ-13-20121025	84.0%	90.8%	98.1%	0
CW-13-20121025	65.2%	80.0%	86.7%	0
MW-01D-20121025	54.0%	64.4%	64.8%	0
MW-01S-20121025	94.7%	68.9%	106%	0
MW-01S-20121025 DL	D	D	D	0
MW-05D-20121025	72.8%	90.8%	86.1%	0
PZ-12-20121025	60.8%	72.4%	77.3%	0
PZ-17-20121026	56.8%	71.2%	79.2%	0
LW-3-20121026	61.2%	64.8%	88.5%	0

	LCS/MB LIMITS	QC LIMITS
(FBP) = 2-Fluorobiphenyl	(51-100)	(38-100)
(TPH) = d14-p-Terphenyl	(54-117)	(27-122)
(TBP) = 2,4,6-Tribromophenol	(46-125)	(31-128)

Prep Method: SW3520C
Log Number Range: 12-21327 to 12-21334

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: LCS-103112
LCS/LCSD

Lab Sample ID: LCS-103112
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted LCS/LCSD: 10/31/12

Date Analyzed LCS: 11/05/12 17:35
LCSD: 11/05/12 18:09
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	16.1	25.0	64.4%	16.1	25.0	64.4%	0.0%
2-Methylnaphthalene	15.2	25.0	60.8%	15.5	25.0	62.0%	2.0%
Acenaphthylene	17.7	25.0	70.8%	18.2	25.0	72.8%	2.8%
Acenaphthene	17.2	25.0	68.8%	18.2	25.0	72.8%	5.6%
Dibenzofuran	16.2	25.0	64.8%	17.2	25.0	68.8%	6.0%
Fluorene	18.3	25.0	73.2%	19.6	25.0	78.4%	6.9%
Pentachlorophenol	64.0	75.0	85.3%	67.4	75.0	89.9%	5.2%
Phenanthrene	18.7	25.0	74.8%	19.3	25.0	77.2%	3.2%
Carbazole	20.8	25.0	83.2%	21.7	25.0	86.8%	4.2%
Anthracene	17.8	25.0	71.2%	18.2	25.0	72.8%	2.2%
Fluoranthene	19.7	25.0	78.8%	20.9	25.0	83.6%	5.9%
Pyrene	18.6	25.0	74.4%	18.9	25.0	75.6%	1.6%
Benzo(a)anthracene	19.0	25.0	76.0%	19.7	25.0	78.8%	3.6%
Chrysene	19.2	25.0	76.8%	19.9	25.0	79.6%	3.6%
Benzo(a)pyrene	17.5	25.0	70.0%	18.0	25.0	72.0%	2.8%
Indeno(1,2,3-cd)pyrene	16.1	25.0	64.4%	17.0	25.0	68.0%	5.4%
Dibenz(a,h)anthracene	16.8	25.0	67.2%	17.7	25.0	70.8%	5.2%
Benzo(g,h,i)perylene	16.7	25.0	66.8%	17.6	25.0	70.4%	5.2%
1-Methylnaphthalene	21.4	25.0	85.6%	21.7	25.0	86.8%	1.4%
Total Benzofluoranthenes	39.4	50.0	78.8%	40.4	50.0	80.8%	2.5%

Semivolatile Surrogate Recovery

	LCS	LCSD
2-Fluorobiphenyl	77.2%	77.6%
d14-p-Terphenyl	92.4%	93.6%
2,4,6-Tribromophenol	97.9%	101%

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
Extraction Method: SW3510C

Sample ID: PZ-13-20121025
SAMPLE

Lab Sample ID: VP53A
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 19:55
Instrument/Analyst: ECD1/YZ

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	85.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
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Sample ID: CW-13-20121025
SAMPLE

Lab Sample ID: VP53B
LIMS ID: 12-21328
Matrix: Water
Data Release Authorized:
Reported: 11/13/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/27/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 20:31
Instrument/Analyst: ECD1/YZ

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	83.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
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Sample ID: MW-01D-20121025
SAMPLE

Lab Sample ID: VP53C
LIMS ID: 12-21329
Matrix: Water
Data Release Authorized:
Reported: 11/13/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/27/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 21:07
Instrument/Analyst: ECD1/YZ

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	88.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C
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Sample ID: MW-05D-20121025
SAMPLE

Lab Sample ID: VP53E
LIMS ID: 12-21331
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 22:20
Instrument/Analyst: ECD1/YZ

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

CAS Number	Analyte	RL	Result
87-86-5	**Pentachlorophenol**	**0.25**	**2.2**

Reported in µg/L (ppb)

Chlorophenol Surrogate Recovery

2,4,6-Tribromophenol	81.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C

Sample ID: PZ-12-20121025
SAMPLE

Lab Sample ID: VP53F
LIMS ID: 12-21332
Matrix: Water
Data Release Authorized:
Reported: 11/14/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/26/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 22:56
Instrument/Analyst: ECD1/YZ

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

CAS Number	Analyte	RL	Result
87-86-5	**Pentachlorophenol**	**0.25**	**0.31**

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
Extraction Method: SW3510C
Page 1 of 1

Sample ID: PZ-17-20121026
SAMPLE

Lab Sample ID: VP53G
LIMS ID: 12-21333
Matrix: Water
Data Release Authorized:
Reported: 11/13/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/26/12
Date Received: 10/27/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 23:32
Instrument/Analyst: ECD1/YZ

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	83.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C

Sample ID: LW-3-20121026
SAMPLE

Lab Sample ID: VP53H
LIMS ID: 12-21334
Matrix: Water
Data Release Authorized:
Reported: 11/13/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/26/12
Date Received: 10/27/12

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 00:08
Instrument/Analyst: ECD1/YZ

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	84.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041
Extraction Method: SW3510C

Sample ID: MB-103112
METHOD BLANK

Lab Sample ID: MB-103112
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/13/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: NA
Date Received: NA

Date Extracted: 10/31/12
Date Analyzed: 11/09/12 18:06
Instrument/Analyst: ECD1/YZ

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

SW8041 CHLOROPHENOLICS SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061

Client ID	TBP	TOT OUT
MB-103112	93.6%	0
LCS-103112	105%*	1
LCSD-103112	115%*	1
PZ-13-20121025	85.6%	0
CW-13-20121025	83.2%	0
MW-01D-20121025	88.4%	0
MW-05D-20121025	81.2%	0
PZ-12-20121025	89.6%	0
PZ-17-20121026	83.6%	0
LW-3-20121026	84.0%	0

	LCS/MB LIMITS	QC LIMITS
(TBP) = 2,4,6-Tribromophenol	(41-98)	(26-113)

Prep Method: SW3510C
Log Number Range: 12-21327 to 12-21334

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCP by GC/ECD Method SW8041

Sample ID: LCS-103112
LCS/LCSD

Lab Sample ID: LCS-103112
LIMS ID: 12-21327
Matrix: Water
Data Release Authorized:
Reported: 11/13/12

QC Report No: VP53-Landau Associates, Inc.
Project: Port of Olympia
20139.060.061
Date Sampled: 10/25/12
Date Received: 10/27/12

Date Extracted LCS/LCSD: 10/31/12

Date Analyzed LCS: 11/09/12 18:42
LCSD: 11/09/12 19:19
Instrument/Analyst LCS: ECD1/YZ
LCSD: ECD1/YZ

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	2.68	2.50	107%	2.96	2.50	118%	9.9%

Chlorophenols Surrogate Recovery

	LCS	LCSD
2,4,6-Tribromophenol	105%	115%

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