January 21, 2016

TO: Cris Matthews (Ecology)
FROM: Karen Mixon (URS)

CC: Mike Droppo (Kinder Morgan), Patrick Davis (Trans Mountain), Cary Brown (URS), Demetrio Cabanillas (URS), Dan Heimbigner (Whatcom Environmental)

RE:	URS Progress Report – October 1 to December 31, 2015
PROJECT:	Cleanup Action Consent Decree No. 14-2-01294-9 (effective 6-5-2014) Laurel Station 1009 E. Smith Road, Bellingham, Washington
TRANS MOUNTAIN PM:	Mike Droppo
ECOLOGY CASE MGR:	Cris Matthews
URS PROJ NO:	60440385
URS PROJ MGR:	Karen Mixon

Introduction:
This progress report is presented in accordance with Consent Decree 14-2-01294-9 (effective 6-5-2014) and is intended to present the information as noted under Section XI PROGRESS REPORTS in the Consent Decree.

Work Accomplished During Reporting Period:

DPE System Operation
The DPE system operated in SVE mode for most of the reporting period. Multiple attempts to operate in DPE mode were not sustainable for extended time periods due to low water levels. Operation in DPE mode was most successful at wells DPE-1 and DPE-2 screened beneath the Pump Station Building because they have the most water present. The other wells in the system were generally off-line when in DPE mode due to the low water levels. When water levels rise, DPE mode operation will be tried in applicable wells. When DPE mode is not sustainable, the system will operate in SVE mode.

Air monitoring using FID and PID field instruments was conducted by Whatcom Environmental twice weekly to monitor the vapor GAC treatment system. Sampling ports were installed before the first carbon unit (pre-treatment), between the first and second units (mid-treatment), and after the 2nd unit (post-treatment). The carbon was changed out/rotated if the PID measurements at the mid-treatment location exceeded 50 ppm. During this reporting period the vapor GAC was changed out 3 times after the change out completed on September 30, 2015.

Treated groundwater discharge from the liquid GAC treatment system began in November 2015. This system consists of 2 carbon vessels with a sampling port before the first carbon vessel (pre-treatment), between the two vessels (mid-treatment), and after the final vessel (post-treatment). Per Administrative Order Docket #11456, treated groundwater from the system was sampled weekly while discharging. Weekly water samples were collected from the mid and post-treatment locations. Water samples were analyzed for gasoline range

URS Corporation
1501 4th Avenue, Suite 1400
Seattle, WA 98101-1616
Tel: 206.438.2700
Fax: 206.438.2699

hydrocarbons, BTEX, and benzo(a)pyrene. All data collected at the location where treated water discharges to the facility stormwater system (sample location "EP-1") was reported to Ecology on quarterly discharge monitoring reports for the facility's NPDES Industrial Stormwater General Permit (WAR001522). There were no exceedances of indicator compounds during this reporting period.

Groundwater Monitoring

URS conducted the first quarterly groundwater sample collection on December 14, 2015. The program was revised from the plan presented in the Compliance Monitoring Plan (CMP, URS 2015) following a discussion with Cris Matthews on October 1, 2015. The revision was necessary to account for the change to the well installations for the DPE system and monitoring well network during the construction phase of the cleanup action. See attached **Figure 2 Site Plan and DPE Well Locations** for well locations.

The DPE system was shut down on Friday December 11, 2015 to allow the groundwater to equilibrate before sample collection. On December 14, 2015, water levels were collected from wells MW-3, MW-4, MW-6, MW-8, and MW-11 through MW-16, SW-1, SW-3, and DPE-4. Well SW-2, a flush-mount well, located in the swale area northwest of the Cold Storage Building, could not be located so a water level was not collected from this well. The water level measurements are summarized in attached **Table 1**. The revised plan included sample collection from wells MW-4, MW-6, MW-15, MW-16, and DPE-4. As noted in **Table 1**, only well MW-6 contained enough water to sample. Monitoring wells MW-4, MW-15, MW-16, and DPE-4 were not sampled as they were dry or minimal water was present in the well.

The sample was collected using low-flow method with a portable bladder pump with sample intake set approximately 18 feet below ground surface. The well was purged 1/2-hour while measuring pH, temperature, specific conductance, dissolved oxygen, and oxidation-reduction potential (ORP). All parameters were within the low flow criteria when purging was stopped. The samples were collected directly into laboratory supplied containers for BTEX/NWTPH-Gx, NWTPH-Dx, and PAH analysis and submitted to Analytical Resources, Inc. the next day via courier. The data were received by URS, validated and tabulated (**Table 2**). All detections in MW-6 were below the groundwater cleanup levels in the Consent Decree. The summary lab report from ARI and the data validation report are attached to this progress report.

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Submittals

In December 2015, URS submitted data collected from July 2014 through August 2015 associated with the cleanup action to Ecology's EIM database.

The DPE O&M manual was drafted and put into internal review.

The Completion Report was drafted and put into internal review.

Deviations to Approved Plans Not Previously Documented:

None

Deviation to Scope of Work and Schedule as Presented in the Cleanup Action Plan (Exhibit A of Consent Decree):

There were no changes from previous progress reports to the overall Scope of Work described in the Cleanup Action Plan (CAP). The DPE system installation was delayed beyond the

schedule anticipated at the time the Consent Decree was filed. The updated schedule for submittal of deliverables will be submitted to Ecology via letter. The proposed submittal dates are shown under **Plans for the Next Reporting Period** in this report.

Data Received During Reporting Period:
Groundwater Monitoring Data – collected December 14, 2015 (ARI Report ASV3)

Plans for the Next Reporting Period:
The following are planned activities for the period from January 1 through March 31, 2016.

- Continue to operate and maintain the DPE system.
- Submit letter with schedule of deliverables to Ecology.
- Submit the O&M manual for the DPE system to Ecology - February 5, 2016.
- Prepare an addendum to the Compliance Monitoring Plan for air and NPDES monitoring associated with discharges from the DPE treatment systems. Submit to Ecology for review and approval by March 31, 2016.
- Submit the Completion Report for the cleanup action through DPE installation to Ecology by March 31, 2016
- Complete first quarter 2016 groundwater sample collection.

Please contact Karen Mixon at (206) 438-2234 if you have any questions or comments regarding this progress report.

References:
URS Corporation, 2015. Final Compliance Monitoring Plan, Laurel Station, 1009 East Smith Road, Bellingham, Washington, January 16, 2015.

Attachments:
Figure 2, Site Plan and DPE Well Locations
Table 1 – Monitoring Well Groundwater Elevation Data Summary
Table 2 – Quarterly Groundwater Monitoring Results
URS Data Validation Report (DVR) for ARI Report ASV3
ARI Summary Lab Report ASV3

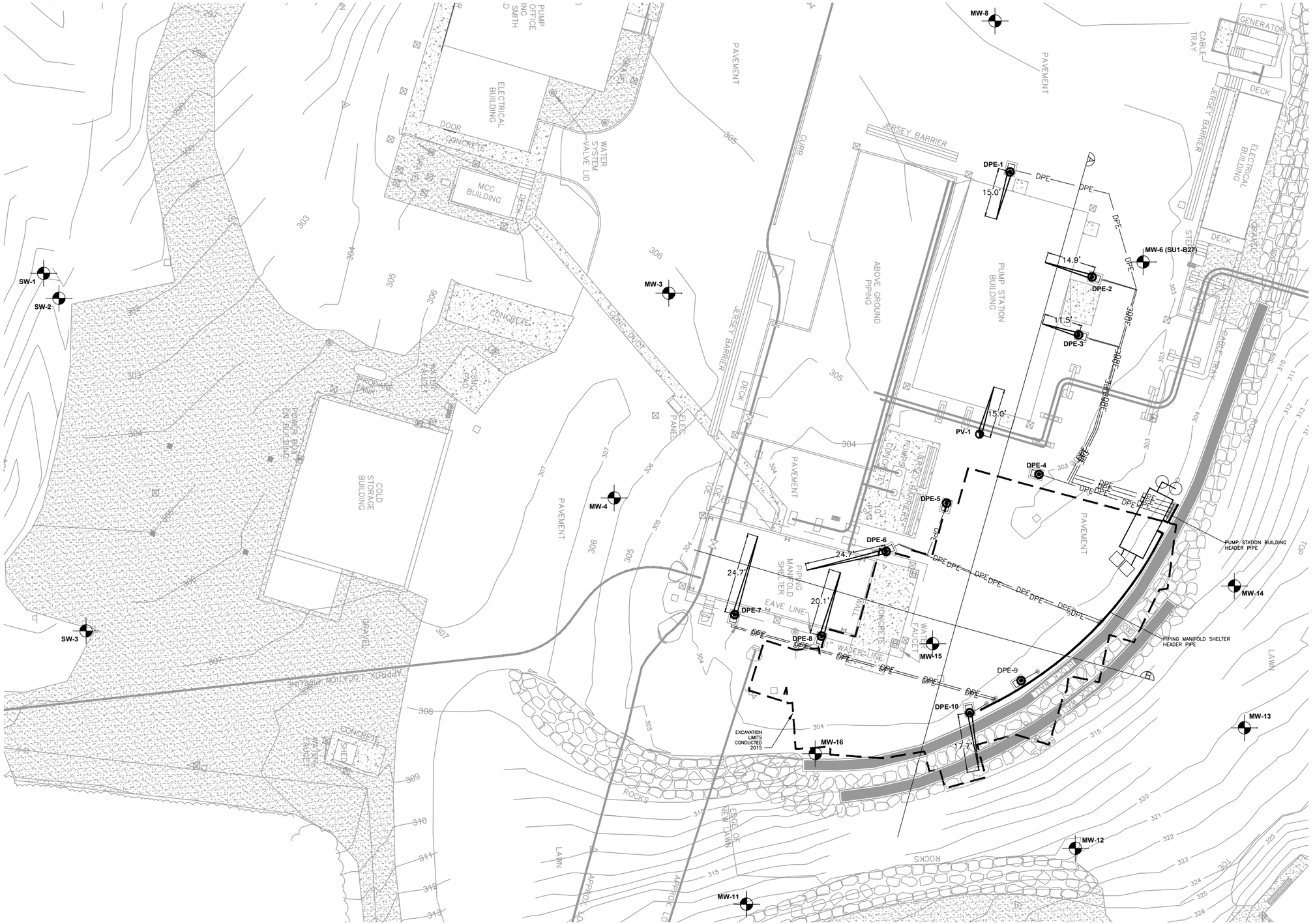


Figure 2
Site Plan and DPE Well Locations

Laurel Station
Bellingham, Washington

URS

Table 1
Monitoring Well Groundwater Elevation Data Summary
Laurel Station
Bellingham, Washington

Well ID	Date Measured	Total Depth[a] (ft-TOC)	TOC Elevation[b] (ft-NAVD88)	Approximate Screen Interval (ft-bgs)	Approximate Screen Interval Elevation (ft-NAVD88)	Depth to Groundwater (ft-TOC)	Groundwater Elevation (ft-NAVD88)	Thickness of Water Column (ft)
SW-1	4/23/2015	18.50	300.64	5 - 20	295.64 - 280.64	4.30	296.34	14.20
	12/14/2015	18.35				4.10	296.54	14.25
SW-2	4/23/2015	49.75	301.37	40 - 50	261.37 - 251.37	37.59	263.78	12.16
SW-3[c]	4/23/2015	34.75	309.48	22 - 32	284.48 - 274.48	32.19	277.29	2.56
	12/14/2015	34.78				33.11	276.37	1.67
DPE-4[d]	4/23/2015	16.91	305.01	6.5 - 16.5	298.51 - 288.51	8.46	296.55	8.45
	10/26/2015	17.00				16.50	288.51	0.50
	12/14/2015	15.70				15.50	289.51	0.20
MW-3	4/23/2015	33.40	305.83	24 - 34	281.83 - 271.83	DRY	NC	NC
	12/14/2015	33.55				DRY	NC	NC
MW-4	4/23/2015	30.15	305.67	20 - 30	285.67 - 275.67	28.07	277.60	2.08
	12/14/2015	30.16				DRY	NC	NC
MW-6	4/23/2015	26.55	302.78	11 - 26	291.78 - 276.78	16.51	286.27	10.04
	11/30/2015	NA				16.17	286.61	10.38
	12/14/2015	26.56				12.92	289.86	13.64
MW-8	4/23/2015	37.10	302.24	23 - 38	279.24 - 264.24	DRY	NC	NC
	12/14/2015	37.08				DRY	NC	NC
MW-11[c]	4/23/2015	48.15	321.31	25 - 45	293.31 - 273.31	DRY	NC	NC
	11/30/2015	NA				47.54	273.77	0.61
	12/14/2015	48.17				47.21	274.10	0.96
MW-12[c]	4/23/2015	51.60	323.53	29 - 49	291.53 - 271.53	DRY	NC	NC
	11/30/2015	NA				50.69	272.84	0.91
	12/14/2015	51.80				51.20	272.33	0.60
MW-13[c]	4/23/2015	62.45	323.20	39 - 59	281.20 - 261.20	DRY	NC	NC
	11/30/2015	NA				63.48	NC	NC
	12/14/2015	62.62				DRY	NC	NC
MW-14	4/23/2015	50.75	316.77	30 - 50	286.77 - 266.77	DRY	NC	NC
	11/30/2015	NA				50.72	266.05	0.03
	12/14/2015	50.94				DRY	NC	NC
MW-15	4/23/2015	34.25	303.54	25 - 35	278.54 - 268.54	DRY	NC	NC
	10/26/2015	33.76				33.72	269.82	0.04
	11/30/2015	NA				33.82	269.72	NC
	12/14/2015	34.24				33.79	269.75	0.45
MW-16	4/23/2015	34.82	304.31	25 - 35	279.31 - 269.31	DRY	NC	NC
	10/26/2015	34.91				34.80	269.51	0.11
	12/14/2015	34.83				DRY	NC	NC

[a]Total depth was measured by sounding the wells prior to sampling and may differ from total depth as installed.

[b]Source of TOC elevations prior to 2011 is from Dames & Moore 1992a. Source of TOC elevations for 2011 is Larry Steele & Associates 2011. Vertical elevation datum prior to 2011 was National Geodetic Vertical Datum 29, and 2011 vertical elevation datum is NAVD 88 (ft).

[c]Stick-up well monument; Well MW-14 casing re-surveyed April 2015 as casing was cut during site work in 2014.

[d]TOC elevation is an estimate as the measurement does not account for the additional length due to DPE well head installation.

Notes:

Highlighted cells recorded a water column less than 0.7 foot. This is an indication that the well is dry and the water measured in the well is due to the collection of water in the bottom cap of the well.

Well is dry.

ft - foot

ft-TOC - feet below top of well casing

ft-NAVD88 - vertical elevation in feet relative to North American Vertical Datum of 1988

ft-bgs - feet below ground surface

NC - not calculated

NM - not measured

Table 2
Quarterly Groundwater Monitoring Results
Laurel Station Cleanup Action
Bellingham, Washington

Sample ID	Groundwater	MW4	MW-6			PV-1	DPE-1	DPE-2	DPE-3	DPE-4	DPE-5	DPE-8
Sample Date	Cleanup Levels	4/23/15	4/23/15	4/23/15 (DUP)	12/14/15	4/24/15	4/24/15	4/24/15	4/23/15	4/24/15	4/24/15	4/23/15
Total Petroleum Hydrocarbons (mg/L)												
Gasoline-range (Gx)	0.8/1.0 [a]	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Diesel-range (Dx)	NE	**0.94**	0.10 U	0.13 U	**0.12**	**0.38**	**2.1**	**0.59**	**0.86**	**0.14**	**0.46**	**0.60**
Motor Oil-range	NE	**0.47**	0.20 U	0.25 U	**0.22**	0.20 U	**0.54**	**0.23**	**0.82**	0.20 U	0.20 U	0.20 U
Total TPH (Sum Dx, Oil-range, mg/L)	0.5	**1.41**	ND	ND	**0.34**	**0.38**	**2.64**	**0.82**	**1.68**	**0.14**	**0.46**	**0.60**
BTEX (ug/L)												
Benzene	5	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	640	0.20 U	0.20 U	0.20 U	0.20 U	**0.26**	0.20 U	**0.55**	**0.37**	0.20 U	0.20 U	**0.44**
Ethylbenzene	700	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
m,p-Xylene	1,600	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
o-Xylene	1,600	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Polycyclic Aromatic Hydrocarbons (ug/L)												
1-Methylnaphthalene	1.51	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	**0.010**	**0.019**	0.010 U	0.010 U	0.010 U
2-Methylnaphthalene	32	NA	**0.019**	NA	0.010 U	0.010 U	0.010 U	0.010 U	**0.022**	0.010 U	0.010 U	0.010 U
Acenaphthene	960	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Acenaphthylene	NE	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Anthracene	4,800	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(a)anthracene [1]	0.12	NA	**0.013**	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(b)fluoranthene [1]	0.12	NA	**0.011**	NA	0.010 U	0.010 U	**0.015**	0.010 U	**0.016**	0.010 U	0.010 U	0.010 U
Benzo(k)fluoranthene [1]	1.2	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(a)pyrene [1]	0.12	NA	**0.012**	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Benzo(g,h,i)perylene	NE	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	**0.015**	0.010 U	0.010 U	0.010 U
Chrysene [1]	12	NA	**0.015**	NA	**0.012**	0.010 U	**0.098**	**0.013**	**0.044**	0.010 U	0.010 U	**0.011**
Dibenz(a,h)anthracene [1]	0.012	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Dibenzofuran	16	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	**0.012**	0.010 U	0.010 U	0.010 U
Fluoranthene	640	NA	**0.017**	NA	**0.013**	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Fluorene	640	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	**0.018**	**0.012**	0.010 U	**0.027**	0.010 U
Indeno(1,2,3-cd)pyrene [1]	0.12	NA	0.010 U	NA	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Naphthalene	160	NA	0.010 U	NA	0.010 U	0.010 U	0.021 U	0.031 U	0.010 U	0.019 U	0.033 U	0.020 U
Phenanthrene	NE	NA	0.010 U	NA	**0.010**	0.010 U	0.010 U	0.010 U	**0.013**	0.010 U	0.010 U	0.010 U
Pyrene	480	NA	**0.022**	NA	**0.014**	0.010 U	**0.057**	**0.020**	**0.031**	0.010 U	0.010 U	**0.012**
Total Benzofluoranthenes	0.12	NA	**0.024 J**	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
TTEC	0.12	NA	0.015	NA	0.00012	NC	0.0025	0.00013	0.0020	NC	NC	0.00011

Notes:
Bolded values indicate that analyte was detected above the laboratory reporting limit.
Bolded and highlighted values exceed the project cleanup levels.
J - estimated value
mg/L - milligram per liter
NA - not analyzed or not applicable
NC- not calculable
NE - not established
TTEC - Total Toxicity Equivalent Concentration, reference WAC173-340-708
U - Compound was analyzed for but not detected above the reporting limit shown.
ug/L - microgram per liter
[a] Gasoline with benzene present/without benzene present
[1] This is considered a carcinogenic polycyclic aromatic hydrocarbon compound.
[2] Total benzofluoranthenes is the sum of the benzo(b)fluoranthene, benzo(j)fluoranthene, and benzo(k)fluoranthene isomers. The cleanup level of 0.12 ug/L is based on benzo(b)fluoranthene.

Memo

Century Square
1501 4th Avenue, Suite 1400
Seattle, Washington 98101
206.438.2700 Telephone
206.438.2699 Fax

To:	Karen Mixon, Project Manager	**Info:**	**FINAL**
From:	Lucy Panteleeff, Chemist	**Date:**	January 18, 2016
RE:	Data Quality Review Quarterly Groundwater Monitoring Samples – December 2015 Laurel Station Cleanup Action		

The data quality review of one groundwater sample and one trip blank collected on December 14, 2015 has been completed. The samples were analyzed by Analytical Resources, Incorporated (ARI) located in Tukwila, Washington for benzene, toluene, ethylbenzene, m,p-xylene, and o-xylene (BTEX) by EPA Method 8260C, total petroleum hydrocarbons (TPHs, gasoline-range, diesel-range, and/or motor oil-range) by Washington State Department of Ecology (Ecology) Methods NWTPH-Gx and NWTPH-Dx, and/or low-level polynuclear aromatic hydrocarbons (PAHs) by modified EPA Method 8270D-SIM. Samples were analyzed for the chemical constituents as described in the *Final Compliance Monitoring Plan, Laurel Station, 1009 East Smith Road, Bellingham, Washington* dated January 16, 2015 (CMP). Due to changes in laboratory procedures, NWTPH-Gx analysis was performed using GC/MS instrumentation instead of GC/FID.

The analyses were performed in general accordance with methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846)* and Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997. The laboratory provided a full data package containing sample results and associated QA/QC data. The following samples are associated with ARI group ASV3:

Sample ID	Laboratory ID	Requested Analyses
MW-6	ASV3A	BTEX, TPH-Gx, TPH-Dx, PAHs
Trip Blank	ASV3B	BTEX, TPH-Gx

The following comments refer to ARI's performance in meeting the quality control specifications described in the analytical methods. Data were qualified based on the method criteria and guidance provided in the EPA document *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, June 2008. Data qualifiers that may be assigned to data from this laboratory group include:

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Multiple results reported from different analytical dates and/or dilutions. Value from another analysis should be used.

Sample Receipt

Upon receipt by ARI, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperature was recorded. No discrepancies relating to sample identification were noted by ARI and the cooler was received at temperatures within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C.

A trip blank was submitted with this sample and analyzed for BTEX and NWTPH-Gx.

Organic Analyses

Samples were analyzed for BTEX, TPHs, and/or PAHs by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. Instrument Performance Checks (GCMS Tunes) – Acceptable

3. Initial and Continuing Calibrations – Acceptable except as noted below:

   PAHs by Method 8270D-SIM – The percent difference (%D) for the surrogate dibenzo(a,h)anthracene-d14 (20.9%, low) was outside the method limits of +/-20% in the continuing calibration verification (CCV) analyzed on December 24, 2015. Data were not qualified based on the surrogate %D outlier.

   NWTPH-Dx – The %D for motor oil (15.5%, high) was outside the method limits of +/- 15% in the CCV analyzed on December 24, 2015 at 2113. This standard was the ending standard for the analytical sequence. The reanalysis of sample MW-6 was associated with this CCV. The sample was initially analyzed on December 23, 2015 but the associated motor oil standard on that date was outside of the method criteria due to carryover on the instrument. The lab reported the reanalysis of MW-6 from December 24, 2015. As the results from the two analyses were comparable, the data were not qualified based on the %D outlier for motor oil.

4. Blanks – Acceptable

5. Surrogates – Acceptable

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable except as noted below:

   BTEX by Method 8260C-Modified – The percent recoveries for the following analytes in the LCS/LCSD analyzed on December 17, 2015 were outside the laboratory control limits.
   .

Analyte	LCS	LCSD	Control Limits
Ethylbenzene	127%	ok	78-122%
o-Xylene	128%	ok	76-127%

ok – result acceptable

   As 2 out of the 3 quality control parameters were acceptable (LCS, LCSD, and/or relative percent difference [RPD]), data were not qualified for ethylbenzene or o-xylene based on the LCS results.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – As noted

   MS/MSDs were not performed for this sampling event. Precision and accuracy were assessed using the LCS/LCSD results.

8. Field Duplicates – As noted

   Field duplicate samples were not collected during this sampling event.

9. Reporting Limits – Acceptable

10. Other Items of Note:

PAHs by Method 8270D-SIM – The response for internal standard perylene-d12 in the low-level reporting limit check standard was -52.28 %. The response for perylene-d12 was acceptable in the CCVs, sample, method blank, and LCS/LCSDs. No data were qualified based on the internal standard response in the low-level reporting limit check standard.

NWTPH-Dx – The laboratory noted that the diesel-range and motor oil-range TPH reported as detected in sample MW-6 did not match the laboratory's standard chromatograms for diesel and motor oil.

Overall Assessment of Data

The data reported in this laboratory group, as reported, are considered to be usable for meeting project objectives. The completeness for laboratory group ASV3 is 100%.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 30, 2015

Karen Mixon
URS Corporation
Century Square
1501 Fourth Avenue Suite 1400
Seattle, WA 98101

RE: Laurel Station Quarterly GW Sampling
ARI Job: ASV3

Dear Karen:

Please find enclosed the original Chain-of-Custody (COC) records, sample receipt documentation, and the final data package for the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this data package will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

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

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

ARI Assigned Number: ASV3	Turn-around Requested: Standard
ARI Client Company: URS / AECOM	Phone: 206-438-2700
Client Contact: Karen Mixon / Christine Gebel	
Client Project Name: Laurel Station Quarterly GW Sampling	
Client Project #: 60440385	Samplers: D Cabanillas / S Merison

Page: 1	of 1
Date: 12-14-15	Ice Present?
No. of Coolers:	Cooler Temps:

Sample ID	Date	Time	Matrix	No. Containers	BTEX, Gx 8260C ~~8021B~~	NWTPH-Dx	PAH 8270D SIM						Notes/Comments
MW-6	12-14-15	1235	GW	7	X	X	X						
Trip Blank	12-14-15	—	—	2									

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Demetrio Cabanillas	Printed Name: Chris Atwell	Printed Name:	Printed Name:
	Company: AECOM/URS	Company: ARI	Company:	Company:
	Date & Time: 12-15-15 900	Date & Time: 12/15/15 ~~10~~ 1300 ca	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: JRS

COC No(s): NA

Assigned ARI Job No: ASV3

Project Name: Laural Station Quarterly GW

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

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): 4.4

Time:

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DX25265

Cooler Accepted by: CA Date: 12/15/15 Time: 1300

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: Box			
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA		

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

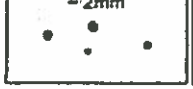
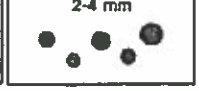
Samples Logged by: CA Date: 12/16/15 Time: 0908

*** 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 Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

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

Sample Receipt:

Analytical Resources, Inc. (ARI) received one water sample and a trip blank on December 15, 2015 logged under ARI Sample Delivery Group (SDG) ASV3. The samples were analyzed for NWTPH-Dx, SIM PAHs and NWTPH-Gx plus BTEX.

SIM PAHs by 8270D SIM:

The samples were extracted on 12/18/15 and analyzed on 12/24/15 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The CCAL surrogate d14-Dibenzo (a,h) anthracene is out of control low. The associated data has been flagged with a "Q" qualifier.

Surrogates: Are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD: The LCS and LCSD are in control.

Diesel Range Organics by NWTPH-D Extended:

The samples were extracted on 12/18/15 and analyzed on 12/24/15 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): Moil #3 CCV is out of control high. The samples were analyzed two times with the same matrix effects and the 12/24/15 analysis was reported.

Surrogates: Are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD: The LCS and LCSD percent recoveries were within control limits.

Gasoline Range Organics by NWTPH-Gx plus BTEX by 8260C/NWTPHG:

The samples were analyzed on 12/17/15 – within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: Are in control.

Method Blanks: The method blanks were free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD: The LCS is out of control high for ethylbenzene and o-Xylene. The LCSD is in control and no further action was taken.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: ASV3
Client: URS
Project Event: 60440385
Project Name: Laurel Station Quarterly GW Samplin

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	MW-6	ASV3A	15-24532	Water	12/14/15 12:35	12/15/15 13:00
2.	Trip Blank	ASV3B	15-24533	Water	12/14/15	12/15/15 13:00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

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

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

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

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

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

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

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

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

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

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

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

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

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

Geotechnical Data

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

Analytical Method Information

Printed: 12/29/2015 9:53 am

8260C VOA in Water (EPA 8260C)

Preservation: pH<2; HCL, Cool <6°C

Container: VOA Vial, Clear, 40 mL, HCL

Amount Required: 120 mL **Hold Time:** 14 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Chloromethane	0.0948	0.500 ug/L		30	59-134	30	59-134	30
Vinyl Chloride	0.0572	0.200 ug/L		30	70-130	30	70-130	30
Bromomethane	0.252	1.00 ug/L		30	52-142	30	52-142	30
Chloroethane	0.0861	0.200 ug/L		30	47-172	30	47-172	30
Trichlorofluoromethane	0.0375	0.200 ug/L		30	70-138	30	70-138	30
Acrolein	2.48	5.00 ug/L		30	45-144	30	45-144	30
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.0429	0.200 ug/L		30	73-125	30	73-125	30
Acetone	2.06	5.00 ug/L		30	46-157	30	46-157	30
1,1-Dichloroethene	0.0540	0.200 ug/L		30	76-123	30	76-123	30
Bromoethane	0.0412	0.200 ug/L		30	72-125	30	72-125	30
Iodomethane	0.227	1.00 ug/L		30	46-143	30	46-143	30
Methylene Chloride	0.485	1.00 ug/L		30	68-129	30	68-129	30
Acrylonitrile	0.604	1.00 ug/L		30	65-124	30	65-124	30
Carbon Disulfide	0.0370	0.200 ug/L		30	69-129	30	69-129	30
trans-1,2-Dichloroethene	0.0485	0.200 ug/L		30	72-124	30	72-124	30
Vinyl Acetate	0.0688	0.200 ug/L		30	62-133	30	62-133	30
1,1-Dichloroethane	0.0533	0.200 ug/L		30	77-122	30	77-122	30
2-Butanone	0.814	5.00 ug/L		30	67-134	30	67-134	30
2,2-Dichloropropane	0.0518	0.200 ug/L		30	71-134	30	71-134	30
cis-1,2-Dichloroethene	0.0427	0.200 ug/L		30	79-120	30	79-120	30
Chloroform	0.0273	0.200 ug/L		30	77-123	30	77-123	30
Bromochloromethane	0.0607	0.200 ug/L		30	77-120	30	77-120	30
1,1,1-Trichloroethane	0.0408	0.200 ug/L		30	78-124	30	78-124	30
1,1-Dichloropropene	0.0340	0.200 ug/L		30	78-120	30	78-120	30
Carbon tetrachloride	0.0439	0.200 ug/L		30	69-129	30	69-139	30
1,2-Dichloroethane	0.0717	0.200 ug/L		30	71-125	30	71-125	30
Benzene	0.0266	0.200 ug/L		30	80-120	30	80-120	30
Trichloroethene	0.0489	0.200 ug/L		30	80-120	30	80-120	30
1,2-Dichloropropane	0.0352	0.200 ug/L		30	79-120	30	79-120	30
Bromodichloromethane	0.0506	0.200 ug/L		30	78-120	30	78-120	30
Dibromomethane	0.145	0.200 ug/L		30	77-120	30	77-120	30
2-Chloroethyl vinyl ether	0.250	1.00 ug/L		30	67-125	30	67-125	30
4-Methyl-2-Pentanone	0.974	5.00 ug/L		30	72-132	30	72-132	30
cis-1,3-Dichloropropene	0.0610	0.200 ug/L		30	79-124	30	79-124	30
Toluene	0.0399	0.200 ug/L		30	80-120	30	80-120	30
trans-1,3-Dichloropropene	0.0815	0.200 ug/L		30	77-126	30	77-126	30
2-Hexanone	0.902	5.00 ug/L		30	70-135	30	70-135	30
1,1,2-Trichloroethane	0.129	0.200 ug/L		30	77-120	30	77-120	30
1,3-Dichloropropane	0.0622	0.200 ug/L		30	80-120	30	80-120	30
Tetrachloroethene	0.0474	0.200 ug/L		30	80-120	30	80-120	30
Dibromochloromethane	0.0481	0.200 ug/L		30	74-121	30	74-121	30
1,2-Dibromoethane	0.0745	0.200 ug/L		30	79-120	30	79-120	30
Chlorobenzene	0.0230	0.200 ug/L		30	80-120	30	80-120	30
Ethylbenzene	0.0371	0.200 ug/L		30	78-122	30	78-122	30
1,1,1,2-Tetrachloroethane	0.0396	0.200 ug/L		30	76-123	30	76-123	30
m,p-Xylene	0.0522	0.400 ug/L		30	78-126	30	78-126	30
o-Xylene	0.0349	0.200 ug/L		30	76-127	30	76-127	30
Xylenes, total	0.0871	0.600 ug/L		30	76-127	30	76-127	30
Styrene	0.0454	0.200 ug/L		30	79-129	30	79-129	30
Bromoform	0.0618	0.200 ug/L		30	57-131	30	57-131	30
1,1,2,2-Tetrachloroethane	0.0598	0.200 ug/L		30	73-120	30	73-120	30
1,2,3-Trichloropropane	0.131	0.500 ug/L		30	69-127	30	69-127	30
trans-1,4-Dichloro 2-Butene	0.324	1.00 ug/L		30	49-144	30	49-144	30
n-Propylbenzene	0.0235	0.200 ug/L		30	73-130	30	73-130	30

Analytical Method Information

(Continued)

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8260C VOA in Water (EPA 8260C) (Continued)

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Bromobenzene	0.0605	0.200 ug/L		30	79-120	30	79-120	30
Isopropyl Benzene	0.0212	0.200 ug/L		30	78-129	30	79-129	30
2-Chlorotoluene	0.0236	0.200 ug/L		30	80-121	30	80-121	30
4-Chlorotoluene	0.0159	0.200 ug/L		30	78-122	30	78-122	30
t-Butylbenzene	0.0256	0.200 ug/L		30	73-129	30	73-129	30
1,3,5-Trimethylbenzene	0.0150	0.200 ug/L		30	77-128	30	77-128	30
1,2,4-Trimethylbenzene	0.0243	0.200 ug/L		30	76-129	30	76-129	30
s-Butylbenzene	0.0237	0.200 ug/L		30	75-128	30	75-128	30
4-Isopropyl Toluene	0.0263	0.200 ug/L		30	74-131	30	74-121	30
1,3-Dichlorobenzene	0.0362	0.200 ug/L		30	79-120	30	79-120	30
1,4-Dichlorobenzene	0.0397	0.200 ug/L		30	77-120	30	77-120	30
n-Butylbenzene	0.0248	0.200 ug/L		30	73-130	30	73-130	30
1,2-Dichlorobenzene	0.0365	0.200 ug/L		30	78-120	30	78-120	30
1,2-Dibromo-3-chloropropane	0.366	0.500 ug/L		30	60-124	30	60-124	30
1,2,4-Trichlorobenzene	0.107	0.500 ug/L		30	54-131	30	54-131	30
Hexachloro-1,3-Butadiene	0.0734	0.500 ug/L		30	55-132	30	55-132	30
Naphthalene	0.118	0.500 ug/L		30	50-135	30	50-135	30
1,2,3-Trichlorobenzene	0.110	0.500 ug/L		30	45-137	30	45-137	30
Dichlorodifluoromethane	0.0521	0.200 ug/L		30	41-159	30	41-159	30
Methyl tert-butyl Ether	0.0729	0.500 ug/L		30	74-127	30	74-127	30
n-Hexane	0.100	0.200 ug/L		30	70-130	30	70-130	30
2-Pentanone	5.00	5.00 ug/L		30	64-184	30	64-184	30
Surr: Dibromofluoromethane			80-120					
Surr: 1,2-Dichloroethane-d4			80-129					
Surr: Toluene-d8			80-120					
Surr: 4-Bromofluorobenzene			80-120					
Surr: 1,2-Dichlorobenzene-d4			80-120					
Pentafluorobenzene								
Chlorobenzene-d5								
1,4-Difluorobenzene								
1,4-Dichlorobenzene-d4								

Analytical Method Information

Printed: 12/29/2015 9:53 am

8260C Gas (NWTPH) in Water (NWTPHg)

Preservation: pH<2; HCL, Cool <6°C

Container: VOA Vial, Clear, 40 mL, HCL

Amount Required: 120 mL **Hold Time:** 14 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Gasoline Range Organics (Tol-Nap)	9.06	250 ug/L		30	80-120	30	80-120	30
Gasoline Range Organics (2MP-TMB)	15.8	250 ug/L		30	80-120	30	80-120	30
Gasoline Range Organics (Tol-C12)	9.13	250 ug/L		30	80-120	30	80-120	30
Gasoline Range Organics (C6-C10)	16.8	250 ug/L		30	80-120	30	80-120	30
Gasoline Range Organics (C5-C12)		250 ug/L		30	30-160	30	30-160	30
Surr: 1,2-Dichloroethane-d4			80-128					
Surr: 1,2-Dichlorobenzene-d4			80-120					
Surr: Toluene-d8			80-120					
Surr: 4-Bromofluorobenzene			80-120					
Surr: Dibromofluoromethane			80-120					
Pentafluorobenzene								
Chlorobenzene-d5								
1,4-Difluorobenzene								
1,4-Dichlorobenzene-d4								

Analytical Method Information

Printed: 12/29/2015 9:53 am

8270D-SIM PAH (0.01 ug/L) in Water (EPA 8270D-SIM)

Preservation: Cool <6°C

Container: Glass NM, Amber, 500 mL **Amount Required:** 1000 **Hold Time:** 7 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Naphthalene	0.00740	0.0100 ug/L		30	37-120	30	37-120	30
2-Methylnaphthalene	0.00384	0.0100 ug/L		30	37-120	30	37-120	30
1-Methylnaphthalene	0.00313	0.0100 ug/L		30	29-120	30	29-120	30
Biphenyl				30	30-160	30	30-160	40
2,6-Dimethylnaphthalene				30	30-160	30	30-160	40
Acenaphthylene	0.00317	0.0100 ug/L		30	41-120	30	41-120	30
Acenaphthene	0.00311	0.0100 ug/L		30	41-120	30	41-120	30
Dibenzofuran	0.00354	0.0100 ug/L		30	38-120	30	38-120	30
2,3,5-Trimethylnaphthalene								
Fluorene	0.00317	0.0100 ug/L		30	43-120	30	43-120	30
Dibenzothiophene								
Phenanthrene	0.00299	0.0100 ug/L		30	41-120	30	41-120	30
Anthracene	0.00248	0.0100 ug/L		30	40-120	30	40-120	30
Carbazole				30	30-160	30	30-160	40
1-Methylphenanthrene				30	30-160	30	30-160	40
Fluoranthene	0.00337	0.0100 ug/L		30	45-120	30	45-120	30
Pyrene	0.00417	0.0100 ug/L		30	41-120	30	41-120	30
Benzo(a)anthracene	0.00347	0.0100 ug/L		30	42-120	30	42-120	30
Chrysene	0.00313	0.0100 ug/L		30	44-120	30	44-120	30
Benzo(b)fluoranthene	0.00356	0.0100 ug/L		30	44-120	30	44-120	30
Benzo(k)fluoranthene	0.00345	0.0100 ug/L		30	50-120	30	50-120	30
Benzo(j)fluoranthene	0.00286	0.0100 ug/L		30	39-160	30	39-160	30
Benzo(e)pyrene				30	30-160	30	30-160	40
Benzo(a)pyrene	0.00237	0.0100 ug/L		30	35-120	30	35-120	30
Perylene	0.00400	0.0100 ug/L		30	30-160	30	30-160	30
Indeno(1,2,3-cd)pyrene	0.00334	0.0100 ug/L		30	37-120	30	37-120	30
Dibenzo(a,h)anthracene	0.00303	0.0100 ug/L		30	34-120	30	34-120	30
Benzo(g,h,i)perylene	0.00312	0.0100 ug/L		30	38-120	30	38-120	30
Benzofluoranthenes, Total	0.00356	0.0100 ug/L		30	46-120	30	46-120	30
Surr: 2-Methylnaphthalene-d10			42-120	30		30		30
Surr: Dibenzo[a,h]anthracene-d14			29-120	30		30		30
Surr: Fluoranthene-d10			57-120	30		30		30
Naphthalene-d8				30		30		30
Acenaphthene-d10				30		30		30
Phenanthrene-d10				30		30		30
Chrysene-d12				30		30		30
Perylene-d12				30		30		30

Analytical Method Information

Printed: 12/29/2015 9:53 am

TPH NW (Extractables) in Water (NWTPH-Dx)

Preservation: Cool <6°C

Container: Glass NM, Amber, 500 mL **Amount Required:** 1000 mL **Hold Time:** 7 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec	RPD	--Blank Spike / LCS-- %Rec	RPD
Diesel Range Organics (C12-C24)	0.0330	0.100 mg/L		30	70-120	30	70-120	30
Diesel Range Organics (C10-C25)	0.0390	0.100 mg/L		30	75-125	30	75-125	30
Diesel Range Organics (Tol-C18)				30		30		30
Diesel Range Organics (C10-24)				30	30-160	30	30-160	30
Diesel Range Organics (C10-C28)				30	30-160	30	30-160	30
Motor Oil Range Organics (C24-C38)	0.0560	0.200 mg/L		30		30		30
Motor Oil Range Organics (C25-C36)	0.0650	0.200 mg/L		30	60-120	30	60-120	30
Motor Oil Range Organics (C24-C40)				30		30		30
Mineral Spirits Range Organics (Tol-C12)				30		30		30
Mineral Oil Range Organics (C24-C38)				30		30		30
Kerosene Range Organics (Tol-C18)				30		30		30
JP8 Range Organics (C8-C18)				30		30		30
JP5 Range Organics (C10-C16)				30		30		30
JP4 Range Organics (Tol-C14)				30		30		30
Jet-A Range Organics (C10-C18)				30		30		30
Creosote Range Organics (C8-C22)				30		30		30
Bunker C Range Organics (C10-C38)				30		30		30
Stoddard Range Organics (C8-C12)				30		30		30
Transformer Oil Range Organics (C12-C28)				30		30		30
Surr: o-Terphenyl			50-150					
Surr: n-Triacontane			50-150					

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by P&T GC/MS-Method SW8260C/NWTPHG **Sample ID: MW-6**
Page 1 of 1 **SAMPLE**

Lab Sample ID: ASV3A
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized: MW
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385
Date Sampled: 12/14/15
Date Received: 12/15/15

Instrument/Analyst: NT2/ML
Date Analyzed: 12/17/15 18:22

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
71-43-2	Benzene	0.20	< 0.20	U	
108-88-3	Toluene	0.20	< 0.20	U	
100-41-4	Ethylbenzene	0.20	< 0.20	U	
179601-23-1	m,p-Xylene	0.40	< 0.40	U	
95-47-6	o-Xylene	0.20	< 0.20	U	
	Reported in µg/L (ppb)				
86290-81-5	Gasoline Range Hydrocarbons	0.25	< 0.25	U	---
	Reported in mg/L (ppm)				

Volatile Surrogate Recovery

d8-Toluene	99.5%
Bromofluorobenzene	97.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by P&T GC/MS-Method SW8260C/NWTPHG **Sample ID: Trip Blank SAMPLE**

Lab Sample ID: ASV3B
LIMS ID: 15-24533
Matrix: Water
Data Release Authorized:
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin 60440385
Date Sampled: 12/14/15
Date Received: 12/15/15

Instrument/Analyst: NT2/ML
Date Analyzed: 12/17/15 16:15

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
71-43-2	Benzene	0.20	< 0.20	U	
108-88-3	Toluene	0.20	< 0.20	U	
100-41-4	Ethylbenzene	0.20	< 0.20	U	
179601-23-1	m,p-Xylene	0.40	< 0.40	U	
95-47-6	o-Xylene	0.20	< 0.20	U	
	Reported in µg/L (ppb)				
86290-81-5	Gasoline Range Hydrocarbons	0.25	< 0.25	U	---
	Reported in mg/L (ppm)				

Volatile Surrogate Recovery

d8-Toluene	99.1%
Bromofluorobenzene	96.0%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-121715A	Method Blank	10	NA	98.6%	97.6%	NA	0
LCS-121715A	Lab Control	10	NA	101%	98.5%	NA	0
LCSD-121715A	Lab Control Dup	10	NA	100%	99.3%	NA	0
ASV3A	MW-6	10	NA	99.5%	97.8%	NA	0
ASV3B	Trip Blank	10	NA	99.1%	96.0%	NA	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(80-129)	(80-129)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 15-24532 to 15-24533

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by P&T GC/MS-Method SW8260C/NWTPHG **Sample ID: LCS-121715A**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-121715A
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized: MW
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/ML
LCSD: NT2/ML
Date Analyzed LCS: 12/17/15 14:02
LCSD: 12/17/15 14:24

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Benzene	8.24	7.04	117%	7.55	7.04	107%	8.7%
Toluene	59.3	49.4	120%	54.8	49.4	111%	7.9%
Ethylbenzene	15.6	12.3	127%	14.3	12.3	116%	8.7%
m,p-Xylene	50.3	40.0	126%	47.3	40.0	118%	6.1%
o-Xylene	19.6	15.3	128%	18.5	15.3	121%	5.8%
Reported in µg/L (ppb)							
Gasoline Range Hydrocarbons	1.14	1.00	114%	1.09	1.00	109%	4.5%
Reported in mg/L (ppm)							

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d8-Toluene	101%	100%
Bromofluorobenzene	98.5%	99.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by P&T GC/MS-Method SW8260C/NWTPHG **Sample ID: MB-121715A**
METHOD BLANK

Lab Sample ID: MB-121715A
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized: MW
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/ML
Date Analyzed: 12/17/15 15:32

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
71-43-2	Benzene	0.20	< 0.20	U	
108-88-3	Toluene	0.20	< 0.20	U	
100-41-4	Ethylbenzene	0.20	< 0.20	U	
179601-23-1	m,p-Xylene	0.40	< 0.40	U	
95-47-6	o-Xylene	0.20	< 0.20	U	
	Reported in µg/L (ppb)				
86290-81-5	Gasoline Range Hydrocarbons	0.25	< 0.25	U	---
	Reported in mg/L (ppm)				

Volatile Surrogate Recovery

d8-Toluene	98.6%
Bromofluorobenzene	97.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: MW-6**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: ASV3A
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized:
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
Event: 60440385
Date Sampled: 12/14/15
Date Received: 12/15/15

Date Extracted: 12/18/15
Date Analyzed: 12/24/15 12:30
Instrument/Analyst: NT11/JLW

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

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	0.010	< 0.010 U
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
90-12-0	1-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	**Phenanthrene**	**0.010**	**0.010**
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	**Fluoranthene**	**0.010**	**0.013**
129-00-0	**Pyrene**	**0.010**	**0.014**
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	**Chrysene**	**0.010**	**0.012**
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U
TOTBFA	Total Benzofluoranthenes	0.020	< 0.020 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	66.3%
d14-Dibenzo(a,h)anthracene	38.7% Q

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385

Client ID	MNP	DBA	TOT OUT
MB-121815	68.7%	61.3%Q	0
LCS-121815	72.0%	62.3%Q	0
LCSD-121815	66.7%	62.0%Q	0
MW-6	66.3%	38.7%Q	0

	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(42-120)
(DBA) = d14-Dibenzo(a,h)anthracene	(29-120)

Prep Method: SW3510C
Log Number Range: 15-24532 to 15-24532

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: LCS-121815
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121815
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized:
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
Event: 60440385
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 12/18/15

Date Analyzed LCS: 12/24/15 11:29
LCSD: 12/24/15 11:59
Instrument/Analyst LCS: NT11/JLW
LCSD: NT11/JLW

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	0.217	0.300	72.3%	0.206	0.300	68.7%	5.2%
2-Methylnaphthalene	0.221	0.300	73.7%	0.210	0.300	70.0%	5.1%
1-Methylnaphthalene	0.221	0.300	73.7%	0.210	0.300	70.0%	5.1%
Acenaphthylene	0.219	0.300	73.0%	0.208	0.300	69.3%	5.2%
Acenaphthene	0.222	0.300	74.0%	0.212	0.300	70.7%	4.6%
Fluorene	0.237	0.300	79.0%	0.231	0.300	77.0%	2.6%
Phenanthrene	0.225	0.300	75.0%	0.215	0.300	71.7%	4.5%
Anthracene	0.206	0.300	68.7%	0.193	0.300	64.3%	6.5%
Fluoranthene	0.228	0.300	76.0%	0.216	0.300	72.0%	5.4%
Pyrene	0.232	0.300	77.3%	0.224	0.300	74.7%	3.5%
Benzo(a)anthracene	0.219	0.300	73.0%	0.211	0.300	70.3%	3.7%
Chrysene	0.218	0.300	72.7%	0.211	0.300	70.3%	3.3%
Benzo(b)fluoranthene	0.231	0.300	77.0%	0.204	0.300	68.0%	12.4%
Benzo(k)fluoranthene	0.211	0.300	70.3%	0.225	0.300	75.0%	6.4%
Benzo(a)pyrene	0.179	0.300	59.7%	0.169	0.300	56.3%	5.7%
Indeno(1,2,3-cd)pyrene	0.199	0.300	66.3%	0.200	0.300	66.7%	0.5%
Dibenz(a,h)anthracene	0.196	0.300	65.3%	0.196	0.300	65.3%	0.0%
Benzo(g,h,i)perylene	0.212	0.300	70.7%	0.208	0.300	69.3%	1.9%
Dibenzofuran	0.231	0.300	77.0%	0.219	0.300	73.0%	5.3%
Total Benzofluoranthenes	0.669	0.900	74.3%	0.646	0.900	71.8%	3.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	72.0%	66.7%
d14-Dibenzo(a,h)anthracene	62.3% Q	62.0% Q

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS **Sample ID: MB-121815**
Extraction Method: SW3510C **METHOD BLANK**

Lab Sample ID: MB-121815
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized:
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
Event: 60440385
Date Sampled: NA
Date Received: NA

Date Extracted: 12/18/15
Date Analyzed: 12/24/15 10:59
Instrument/Analyst: NT11/JLW

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

CAS Number	Analyte	LOQ	Result
91-20-3	Naphthalene	0.010	< 0.010 U
91-57-6	2-Methylnaphthalene	0.010	< 0.010 U
90-12-0	1-Methylnaphthalene	0.010	< 0.010 U
208-96-8	Acenaphthylene	0.010	< 0.010 U
83-32-9	Acenaphthene	0.010	< 0.010 U
86-73-7	Fluorene	0.010	< 0.010 U
85-01-8	Phenanthrene	0.010	< 0.010 U
120-12-7	Anthracene	0.010	< 0.010 U
206-44-0	Fluoranthene	0.010	< 0.010 U
129-00-0	Pyrene	0.010	< 0.010 U
56-55-3	Benzo(a)anthracene	0.010	< 0.010 U
218-01-9	Chrysene	0.010	< 0.010 U
205-99-2	Benzo(b)fluoranthene	0.010	< 0.010 U
207-08-9	Benzo(k)fluoranthene	0.010	< 0.010 U
50-32-8	Benzo(a)pyrene	0.010	< 0.010 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.010	< 0.010 U
53-70-3	Dibenz(a,h)anthracene	0.010	< 0.010 U
191-24-2	Benzo(g,h,i)perylene	0.010	< 0.010 U
132-64-9	Dibenzofuran	0.010	< 0.010 U
TOTBFA	Total Benzofluoranthenes	0.020	< 0.020 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	68.7%
d14-Dibenzo(a,h)anthracene	61.3% Q

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID
Extraction Method: SW3510C
Page 1 of 1

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Sam
60440385

Matrix: Water

Date Received: 12/15/15

Data Release Authorized:
Reported: 12/28/15

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV	DF	Range/Surrogate	RL	Result
MB-121815	Method Blank	12/18/15	12/24/15	1.00		Diesel Range	0.10	< 0.10 U
15-24532	HC ID: ---		FID3B	1.0		Motor Oil Range	0.20	< 0.20 U
						o-Terphenyl		97.1%
ASV3A	MW-6	12/18/15	12/24/15	1.00		**Diesel Range**	**0.10**	**0.12**
15-24532	HC ID: **DRO/RRO**		FID3B	1.0		**Motor Oil Range**	**0.20**	**0.22**
						o-Terphenyl		91.2%

Reported in mg/L (ppm)

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.
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385

Client ID	OTER	TOT OUT
MB-121815	97.1%	0
LCS-121815	98.9%	0
LCSD-121815	101%	0
MW-6	91.2%	0

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

Prep Method: SW3510C
Log Number Range: 15-24532 to 15-24532

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID
Page 1 of 1

Sample ID: LCS-121815
LCS/LCSD

Lab Sample ID: LCS-121815
LIMS ID: 15-24532
Matrix: Water
Data Release Authorized: MW
Reported: 12/28/15

QC Report No: ASV3-URS
Project: Laurel Station Quarterly GW Samplin
60440385
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 12/18/15

Date Analyzed LCS: 12/24/15 18:02
LCSD: 12/24/15 18:24
Instrument/Analyst LCS: FID3B/ML
LCSD: FID3B/ML

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	2.82	3.00	94.0%	2.87	3.00	95.7%	1.8%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	98.9%	101%

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

FORM III

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water
Date Received: 12/15/15

ARI Job: ASV3
Project: Laurel Station Quarterly GW Samplin
60440385

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
15-24532-121815MB1	Method Blank	500 mL	1.00 mL	12/18/15
15-24532-121815LCS1	Lab Control	500 mL	1.00 mL	12/18/15
15-24532-121815LCSD1	Lab Control Dup	500 mL	1.00 mL	12/18/15
15-24532-ASV3A	MW-6	500 mL	1.00 mL	12/18/15