



ALS Environmental
ALS Group USA, Corp
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Kelso, WA 98626
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www.alsglobal.com

December 19, 2018

Analytical Report for Service Request No: K1811632

Amy Dahl
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

RE: PH Pre-Remedial Design Investigation & Baseline / 60566335

Dear Amy,

Enclosed are the results of the sample(s) submitted to our laboratory November 29, 2018
For your reference, these analyses have been assigned our service request number **K1811632**.

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

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager



ALS Environmental
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Butyltins

Low Level Semivolatile Organic Compounds by GCMS

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
 - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



Case Narrative

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline
Sample Matrix: Surface Water

Service Request: K1811632
Date Received: 11/29/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt:

Six surface water samples were received for analysis at ALS Environmental on 11/29/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Semivolatiles by GC/MS:

No significant anomalies were noted with this analysis.

Semivolatile GC:

No significant anomalies were noted with this analysis.

Approved by



Date

12/19/2018



Chain of Custody

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R1811632

ALS-Environmental-Kelso 1317-S-13th-Ave Kelso, WA 98626 Ph: 360-577-7222 Fax 360-636-104		SURFACE WATER CHAIN OF CUSTODY										Date: 11/29/2018 Carrier: ALS Courier		COC No: 1 of 1 COCs							
Client Contact AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Surface Water		Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) <input type="checkbox"/> 21 days <input type="checkbox"/> Other _____				Site Contact: Jennifer Ray / Michaela McCoog Laboratory Contact: Howard-Holmes				Fraction BEHP, Pentachlorophenol, EPA 8270D-LL Tributyltin, Unger et al.											
Sample Identification			Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Sample Specific Notes:												
PDI-WS-T	05	18 11	11/27/2018	15:44	W		BW	4	2	2											
PDI-WS-T	01	18 11	11/28/2018	14:26	W		ED	4	2	2											
PDI-WS-T	01	18 11 D	11/28/2018	14:26	W		ED	4	2	2											
PDI-WS-T	03	18 11	11/27/2018	16:22	W	MS/MSD	BW	10	5	5	Extra TBT and BEHP/PCP included										
PDI-WS-T	07	18 11	11/28/2018	13:18	W		BW	4	2	2											
PDI-RB-PP		18 11 29	11/29/2018	10:00	W		ED	4	2	2	Rinsate Blank										
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)														Sample Disposal <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input checked="" type="checkbox"/> Archive For 12 Months							
Special Instructions/QC Requirements & Comments: 																					
Relinquished by:		Company: AECOM		Date/Time: 11/29/2018 11:57		Received by:		Company: ALS		Date/Time: 11/29/18 11:57											
Relinquished by:		Company: HW		Date/Time: 11/29/18 13:20		Received by:		Company: HW		Date/Time: 11/29/18 13:20											
Relinquished by:		Company:		Date/Time:		Received by:		Company:		Date/Time:											



Cooler Receipt and Preservation Form

Client Aecom Service Request K18 11632
 Received: 11/29/18 Opened: 11/29/18 By: BL Unloaded: 11/29/18 By: BL

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
3.1	3.1	2.9	2.9	0.0	390			NA	
2.8	2.8	0.8	0.8	0.0	332				
2.2	2.1	1.7	1.6	-0.1	360				

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



Butyltins

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T05-1811
Lab Code: K1811632-001

Service Request: K1811632
Date Collected: 11/27/18 15:44
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 10:33	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	77	31 - 137	12/14/18 10:33	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T01-1811
Lab Code: K1811632-002

Service Request: K1811632
Date Collected: 11/28/18 14:26
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 10:52	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	75	31 - 137	12/14/18 10:52	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T01-1811D
Lab Code: K1811632-003

Service Request: K1811632
Date Collected: 11/28/18 14:26
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 11:11	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	100	31 - 137	12/14/18 11:11	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T03-1811
Lab Code: K1811632-004

Service Request: K1811632
Date Collected: 11/27/18 16:22
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 11:31	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	72	31 - 137	12/14/18 11:31	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T07-1811
Lab Code: K1811632-005

Service Request: K1811632
Date Collected: 11/28/18 13:18
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 12:28	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	41	31 - 137	12/14/18 12:28	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-RB-PP-181129
Lab Code: K1811632-006

Service Request: K1811632
Date Collected: 11/29/18 10:00
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 12:48	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	91	31 - 137	12/14/18 12:48	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: Method Blank
Lab Code: KQ1817708-04

Service Request: K1811632
Date Collected: NA
Date Received: NA
Units: ug/L
Basis: NA

Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Tri-n-butyltin Cation	ND U	0.050	0.012	1	12/14/18 10:14	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	46	31 - 137	12/14/18 10:14	

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: PH Pre-Remedial Design Investigation &
SRM Matrix: Surface Water
Sample Name: PDI-WS-T03-1811
Lab Code: KQ1817708-01

Service Request: K1811632
Date Collected: 11/27/18 16:22
Date Received: 11/29/18

Units: ug/L
Basis: NA

Butyltins

Analytical Method: ALS SOP
Prep Method: EPA 3520C

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Tri-n-butyltin Cation	0.012	0.451	0.521	14		1	12/14/18 11:50

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: PH Pre-Remedial Design Investigation &
SRM Matrix: Surface Water
Sample Name: PDI-WS-T03-1811
Lab Code: KQ1817708-02

Service Request: K1811632
Date Collected: 11/27/18 16:22
Date Received: 11/29/18

Units: ug/L
Basis: NA

Butyltins

Analytical Method: ALS SOP
Prep Method: EPA 3520C

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Tri-n-butyltin Cation	0.012	0.450	0.530	16		1	12/14/18 12:09

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: PH Pre-Remedial Design Investigation &
SRM Matrix: Surface Water
Sample Name: Lab Control Sample
Lab Code: KQ1817708-03

Service Request: K1811632
Date Collected: NA
Date Received:

Units: ug/L
Basis: NA

Butyltins

Analytical Method: ALS SOP
Prep Method: EPA 3520C

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
Tri-n-butyltin Cation	0.012	0.399	0.509	24		1	12/14/18 09:55

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632

SURROGATE RECOVERY SUMMARY

Butyltins

Analysis Method: ALS SOP
Extraction Method: EPA 3520C

Sample Name	Lab Code	Tri-n-propyltin
		31-137
PDI-WS-T05-1811	K1811632-001	77
PDI-WS-T01-1811	K1811632-002	75
PDI-WS-T01-1811D	K1811632-003	100
PDI-WS-T03-1811	K1811632-004	72
PDI-WS-T07-1811	K1811632-005	41
PDI-RB-PP-181129	K1811632-006	91
Method Blank	KQ1817708-04	46
Lab Control Sample	KQ1817708-03	93
PDI-WS-T03-1811	KQ1817708-01	91
PDI-WS-T03-1811	KQ1817708-02	84

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Collected: 11/27/18
Date Received: 11/29/18
Date Analyzed: 12/14/18
Date Extracted: 12/4/18

Duplicate Matrix Spike Summary
Butyltins

Sample Name: PDI-WS-T03-1811
Lab Code: K1811632-004
Analysis Method: ALS SOP
Prep Method: EPA 3520C

Units: ug/L
Basis: NA

Analyte Name	Sample Result	Result	Matrix Spike KQ1817708-01		Duplicate Matrix Spike KQ1817708-02		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Tri-n-butyltin Cation	ND U	0.451	0.446	101	0.450	0.446	101	17-142	<1	30

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Analyzed: 12/14/18
Date Extracted: 12/04/18

Lab Control Sample Summary
Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Units: ug/L
Basis: NA
Analysis Lot: 618770

Lab Control Sample
KQ1817708-03

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Tri-n-butyltin Cation	0.399	0.446	89	32-122

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Analyzed: 12/14/18 10:14
Date Extracted: 12/04/18

Method Blank Summary
Butyltins

Sample Name: Method Blank
Lab Code: KQ1817708-04
Analysis Method: ALS SOP
Prep Method: EPA 3520C

Instrument ID: K-GC-26
File ID: J:\GC26\DATA\121418\1214F008.D\
Analysis Lot: 618770
Extraction Lot: 327633

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1817708-03	J:\GC26\DATA\121418\1214F007.D\	12/14/18 09:55
PDI-WS-T05-1811	K1811632-001	J:\GC26\DATA\121418\1214F009.D\	12/14/18 10:33
PDI-WS-T01-1811	K1811632-002	J:\GC26\DATA\121418\1214F010.D\	12/14/18 10:52
PDI-WS-T01-1811D	K1811632-003	J:\GC26\DATA\121418\1214F011.D\	12/14/18 11:11
PDI-WS-T03-1811	K1811632-004	J:\GC26\DATA\121418\1214F012.D\	12/14/18 11:31
PDI-WS-T03-1811MS	KQ1817708-01	J:\GC26\DATA\121418\1214F013.D\	12/14/18 11:50
PDI-WS-T03-1811DMS	KQ1817708-02	J:\GC26\DATA\121418\1214F014.D\	12/14/18 12:09
PDI-WS-T07-1811	K1811632-005	J:\GC26\DATA\121418\1214F015.D\	12/14/18 12:28
PDI-RB-PP-181129	K1811632-006	J:\GC26\DATA\121418\1214F016.D\	12/14/18 12:48

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QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Analyzed: 12/14/18 09:55
Date Extracted: 12/04/18

Lab Control Sample Summary
Butyltins

Sample Name: Lab Control Sample **Instrument ID:** K-GC-26
Lab Code: KQ1817708-03 **File ID:** J:\GC26\DATA\121418\1214F007.D\
Analysis Method: ALS SOP **Analysis Lot:** 618770
Prep Method: EPA 3520C **Extraction Lot:** 327633

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1817708-04	J:\GC26\DATA\121418\1214F008.D\	12/14/18 10:14
PDI-WS-T05-1811	K1811632-001	J:\GC26\DATA\121418\1214F009.D\	12/14/18 10:33
PDI-WS-T01-1811	K1811632-002	J:\GC26\DATA\121418\1214F010.D\	12/14/18 10:52
PDI-WS-T01-1811D	K1811632-003	J:\GC26\DATA\121418\1214F011.D\	12/14/18 11:11
PDI-WS-T03-1811	K1811632-004	J:\GC26\DATA\121418\1214F012.D\	12/14/18 11:31
PDI-WS-T03-1811MS	KQ1817708-01	J:\GC26\DATA\121418\1214F013.D\	12/14/18 11:50
PDI-WS-T03-1811DMS	KQ1817708-02	J:\GC26\DATA\121418\1214F014.D\	12/14/18 12:09
PDI-WS-T07-1811	K1811632-005	J:\GC26\DATA\121418\1214F015.D\	12/14/18 12:28
PDI-RB-PP-181129	K1811632-006	J:\GC26\DATA\121418\1214F016.D\	12/14/18 12:48

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553
Instrument ID: K-GC-26

Signal ID: RTX-1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800553-01	OT5-11E 2PPB	J:\GC26\DATA\121018\1210F008.D	12/10/2018 15:27
02	KC1800553-02	OT5-11F 5PPB	J:\GC26\DATA\121018\1210F009.D	12/10/2018 15:45
03	KC1800553-03	OT5-11G 10PPB	J:\GC26\DATA\121018\1210F010.D	12/10/2018 16:04
04	KC1800553-04	OT5-11H 20PPB	J:\GC26\DATA\121018\1210F011.D	12/10/2018 16:22
05	KC1800553-05	OT5-11B 50PPB	J:\GC26\DATA\121018\1210F012.D	12/10/2018 16:41
06	KC1800553-06	OT5-11I 200PPB	J:\GC26\DATA\121018\1210F013.D	12/10/2018 16:59
07	KC1800553-07	OT5-11J 500PPB	J:\GC26\DATA\121018\1210F014.D	12/10/2018 17:18

Analyte

Tri-n-butyltin Cation

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.782	5.31E4	02	4.455	5.514E4	03	8.910	4.774E4	04	17.820	5.283E4
05	44.550	5.94E4	06	178.200	5.937E4	07	445.500	5.952E4			

Tri-n-propyltin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	2.000	3.258E4	02	5.000	3.834E4	03	10.000	3.909E4	04	20.000	3.744E4
05	50.000	4.591E4	06	200.000	4.689E4	07	500.000	4.819E4			

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553
Instrument ID: K-GC-26

Signal ID: RTX-1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
Tri-n-butyltin Cation	TRG	Average RF	% RSD	8.1	20	5.53E4	
Tri-n-propyltin	SURR	Average RF	% RSD	14.2	20	4.12E4	

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553
Instrument ID: K-GC-26

Signal ID: RTX-35

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800553-01	OT5-11E 2PPB	J:\GC26\DATA\121018\1210F008.D	12/10/2018 15:27
02	KC1800553-02	OT5-11F 5PPB	J:\GC26\DATA\121018\1210F009.D	12/10/2018 15:45
03	KC1800553-03	OT5-11G 10PPB	J:\GC26\DATA\121018\1210F010.D	12/10/2018 16:04
04	KC1800553-04	OT5-11H 20PPB	J:\GC26\DATA\121018\1210F011.D	12/10/2018 16:22
05	KC1800553-05	OT5-11B 50PPB	J:\GC26\DATA\121018\1210F012.D	12/10/2018 16:41
06	KC1800553-06	OT5-11I 200PPB	J:\GC26\DATA\121018\1210F013.D	12/10/2018 16:59
07	KC1800553-07	OT5-11J 500PPB	J:\GC26\DATA\121018\1210F014.D	12/10/2018 17:18

Analyte

Tri-n-butyltin Cation

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	1.782	9.056E4	02	4.455	9.168E4	03	8.910	7.364E4	04	17.820	8.308E4
05	44.550	8.504E4	06	178.200	8.489E4	07	445.500	8.228E4			

Tri-n-propyltin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	2.000	4.442E4	02	5.000	5.926E4	03	10.000	5.945E4	04	20.000	6.616E4
05	50.000	6.137E4	06	200.000	6.641E4	07	500.000	6.474E4			

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553
Instrument ID: K-GC-26

Signal ID: RTX-35

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
Tri-n-butyltin Cation	TRG	Average RF	% RSD	7.1	20	8.445E4	
Tri-n-propyltin	SURR	Average RF	% RSD	12.6	20	6.026E4	

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 12/10/2018

Initial Calibration Verification Summary
Butyltins

Calibration ID: KC1800553
Instrument ID: K-GC-26

Signal ID: RTX-1

#	Lab Code	Sample Name	File Location	Acquisition Date
08	KC1800553-08	OT5-12A ICV 50PPB	J:\GC26\DATA\121118\1211F004.D	12/11/2018 09:01

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
Tri-n-butyltin Cation	44.6	48.1	5.53E4	5.975E4	8.05	±25	Average RF

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 12/10/2018

Initial Calibration Verification Summary
Butyltins

Calibration ID: KC1800553
Instrument ID: K-GC-26

Signal ID: RTX-35

#	Lab Code	Sample Name	File Location	Acquisition Date
08	KC1800553-08	OT5-12A ICV 50PPB	J:\GC26\DATA\121118\1211F004.D	12/11/2018 09:01

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
Tri-n-butyltin Cation	44.6	45.8	8.445E4	8.677E4	2.74	±25	Average RF

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QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335

Service Request:K1811632

Analysis Run Log
Butyltins

Analysis Method:

Analysis Lot:618770
Instrument ID:K-GC-26

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\GC26\DATA\121418\1214F003.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	08:39:00	
J:\GC26\DATA\121418\1214F004.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	08:58:00	
J:\GC26\DATA\121418\1214F005.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	09:17:00	
J:\GC26\DATA\121418\1214F006.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	09:36:00	
J:\GC26\DATA\121418\1214F007.D\	Lab Control Sample	KQ1817708-03	12/14/2018	09:55:00	
J:\GC26\DATA\121418\1214F008.D\	Method Blank	KQ1817708-04	12/14/2018	10:14:00	
J:\GC26\DATA\121418\1214F009.D\	PDI-WS-T05-1811	K1811632-001	12/14/2018	10:33:00	
J:\GC26\DATA\121418\1214F010.D\	PDI-WS-T01-1811	K1811632-002	12/14/2018	10:52:00	
J:\GC26\DATA\121418\1214F011.D\	PDI-WS-T01-1811D	K1811632-003	12/14/2018	11:11:00	
J:\GC26\DATA\121418\1214F012.D\	PDI-WS-T03-1811	K1811632-004	12/14/2018	11:31:00	
J:\GC26\DATA\121418\1214F013.D\	PDI-WS-T03-1811 MS	KQ1817708-01	12/14/2018	11:50:00	
J:\GC26\DATA\121418\1214F014.D\	PDI-WS-T03-1811 DMS	KQ1817708-02	12/14/2018	12:09:00	
J:\GC26\DATA\121418\1214F015.D\	PDI-WS-T07-1811	K1811632-005	12/14/2018	12:28:00	
J:\GC26\DATA\121418\1214F016.D\	PDI-RB-PP-181129	K1811632-006	12/14/2018	12:48:00	
J:\GC26\DATA\121418\1214F017.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	13:07:00	
J:\GC26\DATA\121418\1214F018.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	13:26:00	
J:\GC26\DATA\121418\1214F019.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	13:46:00	
J:\GC26\DATA\121418\1214F020.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	14:06:00	
J:\GC26\DATA\121418\1214F021.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	14:25:00	
J:\GC26\DATA\121418\1214F022.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	14:45:00	
J:\GC26\DATA\121418\1214F023.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	15:05:00	

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Prep Summary Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632

Butyltins

Prep Method: EPA 3520C
Analytical Method: ALS SOP

Extraction Lot: 327633
Extraction Date: 12/04/18 18:50

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-WS-T05-1811	K1811632-001	11/27/18	11/29/18	500 mL	1 mL	
PDI-WS-T01-1811	K1811632-002	11/28/18	11/29/18	500 mL	1 mL	
PDI-WS-T01-1811D	K1811632-003	11/28/18	11/29/18	500 mL	1 mL	
PDI-WS-T03-1811	K1811632-004	11/27/18	11/29/18	500 mL	1 mL	
PDI-WS-T07-1811	K1811632-005	11/28/18	11/29/18	500 mL	1 mL	
PDI-RB-PP-181129	K1811632-006	11/29/18	11/29/18	500 mL	1 mL	
Matrix Spike	KQ1817708-01MS	11/27/18	11/29/18	500 mL	1 mL	
Duplicate Matrix Spike	KQ1817708-02DMS	11/27/18	11/29/18	500 mL	1 mL	
Lab Control Sample	KQ1817708-03LCS	NA	NA	500 mL	1 mL	
Method Blank	KQ1817708-04MB	NA	NA	500 mL	1 mL	



Low Level Semivolatile Organic Compounds by GC/MS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T05-1811
Lab Code: K1811632-001

Service Request: K1811632
Date Collected: 11/27/18 15:44
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	0.14 J	1.0	0.13	1	12/08/18 15:44	11/30/18	
Pentachlorophenol (PCP)	ND U	1.0	0.34	1	12/08/18 15:44	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	89	35 - 132	12/08/18 15:44	
p-Terphenyl-d14	90	48 - 109	12/08/18 15:44	

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Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T01-1811
Lab Code: K1811632-002

Service Request: K1811632
Date Collected: 11/28/18 14:26
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	ND U	1.0	0.13	1	12/08/18 16:12	11/30/18	
Pentachlorophenol (PCP)	ND U	1.0	0.34	1	12/08/18 16:12	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	85	35 - 132	12/08/18 16:12	
p-Terphenyl-d14	84	48 - 109	12/08/18 16:12	

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Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T01-1811D
Lab Code: K1811632-003

Service Request: K1811632
Date Collected: 11/28/18 14:26
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	ND U	0.94	0.13	1	12/08/18 16:41	11/30/18	
Pentachlorophenol (PCP)	ND U	0.94	0.34	1	12/08/18 16:41	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	77	35 - 132	12/08/18 16:41	
p-Terphenyl-d14	80	48 - 109	12/08/18 16:41	

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Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T03-1811
Lab Code: K1811632-004

Service Request: K1811632
Date Collected: 11/27/18 16:22
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	ND U	0.94	0.13	1	12/08/18 15:16	11/30/18	
Pentachlorophenol (PCP)	ND U	0.94	0.34	1	12/08/18 15:16	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	39	35 - 132	12/08/18 15:16	
p-Terphenyl-d14	52	48 - 109	12/08/18 15:16	

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dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T07-1811
Lab Code: K1811632-005

Service Request: K1811632
Date Collected: 11/28/18 13:18
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	ND U	1.0	0.13	1	12/08/18 17:09	11/30/18	
Pentachlorophenol (PCP)	ND U	1.0	0.34	1	12/08/18 17:09	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	89	35 - 132	12/08/18 17:09	
p-Terphenyl-d14	86	48 - 109	12/08/18 17:09	

ALS Group USA, Corp.
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Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: PDI-RB-PP-181129
Lab Code: K1811632-006

Service Request: K1811632
Date Collected: 11/29/18 10:00
Date Received: 11/29/18 13:20

Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	0.17 J	0.96	0.13	1	12/08/18 17:37	11/30/18	
Pentachlorophenol (PCP)	ND U	0.96	0.34	1	12/08/18 17:37	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	80	35 - 132	12/08/18 17:37	
p-Terphenyl-d14	90	48 - 109	12/08/18 17:37	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water
Sample Name: Method Blank
Lab Code: KQ1817494-04

Service Request: K1811632
Date Collected: NA
Date Received: NA
Units: ug/L
Basis: NA

Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Bis(2-ethylhexyl) Phthalate	ND U	0.94	0.13	1	12/08/18 13:23	11/30/18	
Pentachlorophenol (PCP)	ND U	0.94	0.34	1	12/08/18 13:23	11/30/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	77	35 - 132	12/08/18 13:23	
p-Terphenyl-d14	88	48 - 109	12/08/18 13:23	

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632

SURROGATE RECOVERY SUMMARY
Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	2,4,6-Tribromophenol	p-Terphenyl-d14
		35-132	48-109
PDI-WS-T05-1811	K1811632-001	89	90
PDI-WS-T01-1811	K1811632-002	85	84
PDI-WS-T01-1811D	K1811632-003	77	80
PDI-WS-T03-1811	K1811632-004	39	52
PDI-WS-T07-1811	K1811632-005	89	86
PDI-RB-PP-181129	K1811632-006	80	90
Method Blank	KQ1817494-04	77	88
Lab Control Sample	KQ1817494-03	88	83
PDI-WS-T03-1811	KQ1817494-01	93	83
PDI-WS-T03-1811	KQ1817494-02	101	86

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dba ALS Environmental

QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335

Service Request: K1811632
Date Analyzed: 12/08/18 07:15

Internal Standard Area and RT SUMMARY
Low Level Semivolatile Organic Compounds by GC/MS

File ID: J:\MS29\DATA\120818\1208F002.D\
Instrument ID: K-MS-29
Analysis Method: 8270D

Lab Code: KQ1817961-02
Analysis Lot: 618127
Signal ID: 1

	Chrysene-d12		Phenanthrene-d10	
	Area	RT	Area	RT
Result ==>	101,017	15.59	115,780	12.07
Upper Limit ==>	202,034	16.09	231,560	12.57
Lower Limit ==>	50,509	15.09	57,890	11.57

Associated Analyses

Method Blank	KQ1817494-04	86125	15.60	103106	12.07
Lab Control Sample	KQ1817494-03	92338	15.59	113607	12.07
PDI-WS-T03-1811MS	KQ1817494-01	91329	15.59	113735	12.07
PDI-WS-T03-1811DMS	KQ1817494-02	93437	15.59	113068	12.07
PDI-WS-T03-1811	K1811632-004	82848	15.59	109761	12.07
PDI-WS-T05-1811	K1811632-001	85543	15.59	111564	12.07
PDI-WS-T01-1811	K1811632-002	82181	15.59	110694	12.07
PDI-WS-T01-1811D	K1811632-003	85308	15.59	111789	12.07
PDI-WS-T07-1811	K1811632-005	81633	15.59	111146	12.07
PDI-RB-PP-181129	K1811632-006	80522	15.60	106759	12.07

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Collected: 11/27/18
Date Received: 11/29/18
Date Analyzed: 12/8/18
Date Extracted: 11/30/18

Duplicate Matrix Spike Summary
Low Level Semivolatile Organic Compounds by GC/MS

Sample Name: PDI-WS-T03-1811
Lab Code: K1811632-004
Analysis Method: 8270D
Prep Method: EPA 3520C

Units: ug/L
Basis: NA

Analyte Name	Sample Result	Result	Matrix Spike KQ1817494-01		Duplicate Matrix Spike KQ1817494-02			% Rec Limits	RPD	RPD Limit
			Spike Amount	% Rec	Result	Spike Amount	% Rec			
Bis(2-ethylhexyl) Phthalate	ND U	3.87	5.00	77	3.74	5.00	75	10-171	3	30
Pentachlorophenol (PCP)	ND U	4.72	5.00	94	4.40	5.00	88	28-158	7	30

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

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

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

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QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Analyzed: 12/08/18
Date Extracted: 11/30/18

Lab Control Sample Summary
Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3520C

Units: ug/L
Basis: NA
Analysis Lot: 618127

Lab Control Sample
KQ1817494-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Bis(2-ethylhexyl) Phthalate	3.60	5.00	72	42-147
Pentachlorophenol (PCP)	3.61	5.00	72	27-112

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QA/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request: K1811632
Date Analyzed: 12/08/18 13:51
Date Extracted: 11/30/18

Lab Control Sample Summary
Low Level Semivolatile Organic Compounds by GC/MS

Sample Name: Lab Control Sample **Instrument ID:** K-MS-29
Lab Code: KQ1817494-03 **File ID:** J:\MS29\DATA\120818\1208F016.D\
Analysis Method: 8270D **Analysis Lot:** 618127
Prep Method: EPA 3520C **Extraction Lot:** 327368

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1817494-04	J:\MS29\DATA\120818\1208F015.D\	12/08/18 13:23
PDI-WS-T03-1811MS	KQ1817494-01	J:\MS29\DATA\120818\1208F017.D\	12/08/18 14:20
PDI-WS-T03-1811DMS	KQ1817494-02	J:\MS29\DATA\120818\1208F018.D\	12/08/18 14:48
PDI-WS-T03-1811	K1811632-004	J:\MS29\DATA\120818\1208F019.D\	12/08/18 15:16
PDI-WS-T05-1811	K1811632-001	J:\MS29\DATA\120818\1208F020.D\	12/08/18 15:44
PDI-WS-T01-1811	K1811632-002	J:\MS29\DATA\120818\1208F021.D\	12/08/18 16:12
PDI-WS-T01-1811D	K1811632-003	J:\MS29\DATA\120818\1208F022.D\	12/08/18 16:41
PDI-WS-T07-1811	K1811632-005	J:\MS29\DATA\120818\1208F023.D\	12/08/18 17:09
PDI-RB-PP-181129	K1811632-006	J:\MS29\DATA\120818\1208F024.D\	12/08/18 17:37

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QC/QC Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335

Service Request: K1811632
Date Analyzed: 12/08/18 06:47

Tune Summary
Low Level Semivolatile Organic Compounds by GC/MS

File ID: J:\MS29\DATA\120818\1208F001.D\
Instrument ID: K-MS-29

Analytical Method: 8270D
Analysis Lot: 618127

Target Mass	Relative to Mass	Lower Limit %	Upper Limit %	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	37.92	446769	Pass
68	69	0	2	0.00	0	Pass
69	198	0	100	40.45	476566	Pass
70	69	0	2	0.51	2443	Pass
127	198	10	80	45.92	540928	Pass
197	198	0	2	0.00	0	Pass
198	442	30	100	75.84	1178093	Pass
199	198	5	9	6.66	78498	Pass
275	198	10	60	30.22	356053	Pass
365	442	1	50	2.32	36061	Pass
441	443	0.01	100	83.89	251882	Pass
442	442	30	100	100.00	1553408	Pass
443	442	15	24	19.33	300266	Pass

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1817961-02	J:\MS29\DATA\120818\1208F002.D\	12/08/18 07:15	
Method Blank	KQ1817494-04	J:\MS29\DATA\120818\1208F015.D\	12/08/18 13:23	
Lab Control Sample	KQ1817494-03	J:\MS29\DATA\120818\1208F016.D\	12/08/18 13:51	
PDI-WS-T03-1811	KQ1817494-01	J:\MS29\DATA\120818\1208F017.D\	12/08/18 14:20	
PDI-WS-T03-1811	KQ1817494-02	J:\MS29\DATA\120818\1208F018.D\	12/08/18 14:48	
PDI-WS-T03-1811	K1811632-004	J:\MS29\DATA\120818\1208F019.D\	12/08/18 15:16	
PDI-WS-T05-1811	K1811632-001	J:\MS29\DATA\120818\1208F020.D\	12/08/18 15:44	
PDI-WS-T01-1811	K1811632-002	J:\MS29\DATA\120818\1208F021.D\	12/08/18 16:12	
PDI-WS-T01-1811D	K1811632-003	J:\MS29\DATA\120818\1208F022.D\	12/08/18 16:41	
PDI-WS-T07-1811	K1811632-005	J:\MS29\DATA\120818\1208F023.D\	12/08/18 17:09	
PDI-RB-PP-181129	K1811632-006	J:\MS29\DATA\120818\1208F024.D\	12/08/18 17:37	

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 11/29/2018

Initial Calibration Summary
Low Level Semivolatile Organic Compounds by GC/MS

Calibration ID: KC1800541
Instrument ID: K-MS-29

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800541-01	SVO_LL ICAL @ 0.05ppm SVM59-69C	J:\MS29\DATA\112918\1129F003.D	11/29/2018 16:08
02	KC1800541-02	SVO_LL ICAL @ 0.10ppm SVM59-69D	J:\MS29\DATA\112918\1129F004.D	11/29/2018 16:36
03	KC1800541-03	SVO_LL ICAL @ 0.20ppm SVM59-69E	J:\MS29\DATA\112918\1129F005.D	11/29/2018 17:05
04	KC1800541-04	SVO_LL ICAL @ 0.50ppm SVM59-69F	J:\MS29\DATA\112918\1129F006.D	11/29/2018 17:33
05	KC1800541-05	SVO_LL ICAL @ 1.0ppm SVM59-69G	J:\MS29\DATA\112918\1129F007.D	11/29/2018 18:02
06	KC1800541-06	SVO_LL ICAL @ 2.0ppm SVM59-69H	J:\MS29\DATA\112918\1129F008.D	11/29/2018 18:30
07	KC1800541-07	SVO_LL ICAL @ 3.0ppm SVM59-69I	J:\MS29\DATA\112918\1129F009.D	11/29/2018 18:59
08	KC1800541-08	SVO_LL ICAL @ 5.0ppm SVM59-69J	J:\MS29\DATA\112918\1129F010.D	11/29/2018 19:27
09	KC1800541-09	SVO_LL ICAL @ 7.0ppm SVM59-69K	J:\MS29\DATA\112918\1129F011.D	11/29/2018 19:56
10	KC1800541-10	SVO_LL ICAL @ 10ppm SVM59-69L	J:\MS29\DATA\112918\1129F012.D	11/29/2018 20:24

Analyte

2,4,6-Tribromophenol

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	100.000	0.09662	03	200.000	0.09776	04	500.000	0.1087	05	1000.000	0.119
06	2000.000	0.1226	07	3000.000	0.1244	08	5000.000	0.1299	09	7000.000	0.1313
10	10000.000	0.1355									

Bis(2-ethylhexyl) Phthalate

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	50.000	0.9326	02	100.000	0.8946	03	200.000	0.9411	04	500.000	0.9042
05	1000.000	0.9414	06	2000.000	1.015	07	3000.000	1.047	08	5000.000	1.058
09	7000.000	1.068	10	10000.000	1.036						

Pentachlorophenol (PCP)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
04	500.000	0.09709	05	1000.000	0.1154	06	2000.000	0.1366	07	3000.000	0.1424
08	5000.000	0.1519	09	7000.000	0.1578	10	10000.000	0.1636			

p-Terphenyl-d14

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
03	200.000	1.023	04	500.000	0.9821	05	1000.000	1.008	06	2000.000	0.9546
07	3000.000	1.002	08	5000.000	1.022	09	7000.000	1.053	10	10000.000	1.02

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 11/29/2018

Initial Calibration Summary
Low Level Semivolatile Organic Compounds by GC/MS

Calibration ID: KC1800541
Instrument ID: K-MS-29

Signal ID: 1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
2,4,6-Tribromophenol	SURR	Average RF	% RSD	12.1	20	0.1184	0.010
Bis(2-ethylhexyl) Phthalate	TRG	Average RF	% RSD	6.9	20	0.9838	0.010
Pentachlorophenol (PCP)	TRG	Quadratic	COD	0.9999	0.990	0.1378	0.050
p-Terphenyl-d14	SURR	Average RF	% RSD	2.9	20	1.008	0.010

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline

Service Request: K1811632
Calibration Date: 11/29/2018

Initial Calibration Verification Summary
Low Level Semivolatile Organic Compounds by GC/MS

Calibration ID: KC1800541
Instrument ID: K-MS-29

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800541-11	SVO_LL ICV @ 3.0ppm SVM59-63B	J:\MS29\DATA\112918\1129F013.D	11/29/2018 20:53

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
Bis(2-ethylhexyl) Phthalate	3000	2750	9.838E-1	9.027E-1	-8.241	±30	Average RF
Pentachlorophenol (PCP)	3000	2820	1.378E-1	1.347E-1	-5.862	±30	Quadratic

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4,6-Tribromophenol	3000	2950	1.184E-1	1.166E-1	-1.521	±30	Average RF
p-Terphenyl-d14	3000	2660	1.008E0	8.93E-1	-11.405	±30	Average RF

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335

Service Request: K1811632
Date Analyzed: 12/08/18 07:15

**Continuing Calibration Verification (CCV) Summary
Low Level Semivolatile Organic Compounds by GC/MS**

Analysis Method: 8270D
File ID: J:\MS29\DATA\120818\1208F002.D\
Signal ID: 1

Calibration Date: 11/29/2018
Calibration ID: KC1800541
Analysis Lot: 618127
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Bis(2-ethylhexyl) Phthalate	3000	2760	0.9838	0.9041	-8.1	NA	±20	Average RF
Pentachlorophenol (PCP)	3000	2670	0.1378	0.1266	NA	-10.9	±20	Quadratic

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4,6-Tribromophenol	3000	3120	0.1184	0.1231	4.0	NA	±20	Average RF
p-Terphenyl-d14	3000	2700	1.008	0.9063	-10.1	NA	±20	Average RF

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335

Service Request: K1811632

Analysis Run Log
Low Level Semivolatile Organic Compounds by GC/MS

Analysis Method:

Analysis Lot: 618127
Instrument ID: K-MS-29

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\MS29\DATA\120818\1208F001.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	06:47:00	
J:\MS29\DATA\120818\1208F002.D\	Continuing Calibration Verification	KQ1817961-02	12/8/2018	07:15:00	
J:\MS29\DATA\120818\1208F003.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	07:44:00	
J:\MS29\DATA\120818\1208F004.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	08:12:00	
J:\MS29\DATA\120818\1208F005.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	08:40:00	
J:\MS29\DATA\120818\1208F007.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	09:37:00	
J:\MS29\DATA\120818\1208F008.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	10:05:00	
J:\MS29\DATA\120818\1208F009.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	10:33:00	
J:\MS29\DATA\120818\1208F010.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	11:02:00	
J:\MS29\DATA\120818\1208F011.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	11:30:00	
J:\MS29\DATA\120818\1208F012.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	11:58:00	
J:\MS29\DATA\120818\1208F013.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	12:27:00	
J:\MS29\DATA\120818\1208F014.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	12:55:00	
J:\MS29\DATA\120818\1208F015.D\	Method Blank	KQ1817494-04	12/8/2018	13:23:00	
J:\MS29\DATA\120818\1208F016.D\	Lab Control Sample	KQ1817494-03	12/8/2018	13:51:00	
J:\MS29\DATA\120818\1208F017.D\	PDI-WS-T03-1811 MS	KQ1817494-01	12/8/2018	14:20:00	
J:\MS29\DATA\120818\1208F018.D\	PDI-WS-T03-1811 DMS	KQ1817494-02	12/8/2018	14:48:00	
J:\MS29\DATA\120818\1208F019.D\	PDI-WS-T03-1811	K1811632-004	12/8/2018	15:16:00	
J:\MS29\DATA\120818\1208F020.D\	PDI-WS-T05-1811	K1811632-001	12/8/2018	15:44:00	
J:\MS29\DATA\120818\1208F021.D\	PDI-WS-T01-1811	K1811632-002	12/8/2018	16:12:00	
J:\MS29\DATA\120818\1208F022.D\	PDI-WS-T01-1811D	K1811632-003	12/8/2018	16:41:00	
J:\MS29\DATA\120818\1208F023.D\	PDI-WS-T07-1811	K1811632-005	12/8/2018	17:09:00	
J:\MS29\DATA\120818\1208F024.D\	PDI-RB-PP-181129	K1811632-006	12/8/2018	17:37:00	

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Prep Summary Report

Client: AECOM
Project: PH Pre-Remedial Design Investigation & Baseline/60566335
Sample Matrix: Surface Water

Service Request:K1811632

Low Level Semivolatile Organic Compounds by GC/MS

Prep Method: EPA 3520C
Analytical Method: 8270D

Extraction Lot: 327368
Extraction Date: 11/30/18 17:04

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-WS-T05-1811	K1811632-001	11/27/18	11/29/18	1000 mL	2 mL	
PDI-WS-T01-1811	K1811632-002	11/28/18	11/29/18	1000 mL	2 mL	
PDI-WS-T01-1811D	K1811632-003	11/28/18	11/29/18	1060.0000	2 mL	
PDI-WS-T03-1811	K1811632-004	11/27/18	11/29/18	1060.0000	2 mL	
PDI-WS-T07-1811	K1811632-005	11/28/18	11/29/18	1000 mL	2 mL	
PDI-RB-PP-181129	K1811632-006	11/29/18	11/29/18	1040.0000	2 mL	
Matrix Spike	KQ1817494-01MS	11/27/18	11/29/18	1000 mL	2 mL	
Duplicate Matrix Spike	KQ1817494-02DMS	11/27/18	11/29/18	1000 mL	2 mL	
Lab Control Sample	KQ1817494-03LCS	NA	NA	1000 mL	2 mL	
Method Blank	KQ1817494-04MB	NA	NA	1060.0000	2 mL	