



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

December 21, 2018

Analytical Report for Service Request No: K1811742

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

RE: Portland Harbor Pre-Remedial Design Investigation / 60566335

Dear Amy,

Enclosed are the results of the sample(s) submitted to our laboratory December 03, 2018
For your reference, these analyses have been assigned our service request number **K1811742**.

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

A handwritten signature in black ink, appearing to read "Howard Holmes".

For Howard Holmes
Project Manager



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 - 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.cdpb.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.pjlabs.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: Portland Harbor Pre-Remedial Design Investigation
Sample Matrix: Water

Service Request: K1811742
Date Received: 12/03/2018

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:

Three water samples were received for analysis at ALS Environmental on 12/03/2018. 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.

Semivova GC:

No significant anomalies were noted with this analysis.

Approved by

A handwritten signature in black ink, appearing to read "Elynn Durr". It is positioned above a horizontal line.

Date 12/21/2018



Chain of Custody

ALS Environmental—Kelso Laboratory
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H1811742

ALS-Environmental-Kelso 1317-S-13th-Ave Kelso, WA 98626 Ph: 360-577-7222 Fax 360-636-104		SURFACE WATER CHAIN OF CUSTODY												
Client Contact		Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010				Site Contact: Jennifer Ray / Michaela McCoog Laboratory Contact: Howard-Holmes				Date: 12/03/2018		COC No: 1 of 1 COCs		
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		Analysis Turnaround Time Calendar (C) or Work Days (W)												
		<input type="checkbox"/> 21 days												
		<input type="checkbox"/> Other _____												
Sample Identification		Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.							Sample Specific Notes: 12/1/2018 per AECOM (HBT)
PDI-WS-T	02	18/11	11/30/2018	15:06	W	ED	4	<input type="checkbox"/>						
PDI-WS-T	04	18/12	12/3/2018	13:10	W	ED	4	<input type="checkbox"/>						
PDI-WS-T	06	18/11	11/30/2018	16:26	W	BW	4	<input type="checkbox"/>						
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column Preservative: HCl = Hydrochloric Acid, H ₃ PO ₄ = Phosphoric Acid, HNO ₃ = 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: <i>rd</i>	Company: AECOM	Date/Time: 12/3/18 1155	Received by: <i>JM</i>	Company: ALS	Date/Time: 12/3/18 1155									
Relinquished by: <i>rd</i>	Company: ALS	Date/Time: 12/3/18 1255	Received by: <i>James</i>	Company: ALS	Date/Time: 12/3/18 1255									
Relinquished by: <i>rd</i>	Company:	Date/Time:	Received by:	Company:	Date/Time:									

PC HH

Cooler Receipt and Preservation Form

Client AecomService Request K18 11742Received: 12/3/18Opened: 12/3/18By: CGUnloaded: 12/3/18By: CG1. 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? 1 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	File
0.0	-0.1	3.4	3.3	-0.1	381	NA			

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

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-WS-T02-1811
Lab Code: K1811742-001
Service Request: K1811742
Date Collected: 11/30/18 15:06
Date Received: 12/03/18 12:55
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 13:46	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	74	31 - 137	12/14/18 13:46	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-WS-T04-1812
Lab Code: K1811742-002

Service Request: K1811742
Date Collected: 12/01/18 13:10
Date Received: 12/03/18 12:55

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 14:06	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	61	31 - 137	12/14/18 14:06	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-WS-T06-1811
Lab Code: K1811742-003
Service Request: K1811742
Date Collected: 11/30/18 16:26
Date Received: 12/03/18 12:55
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 14:25	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	66	31 - 137	12/14/18 14:25	

ALS Group USA, Corp.
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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ1817708-04

Service Request: K1811742
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.
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Confirmation Results

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
SRM Matrix: Water
Sample Name: Lab Control Sample
Lab Code: KQ1817708-03

Service Request: K1811742
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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM **Service Request:** K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Butyltins

Analysis Method: ALS SOP
Extraction Method: EPA 3520C

Sample Name	Lab Code	Tri-n-propyltin	
		31-137	
PDI-WS-T02-1811	K1811742-001	74	
PDI-WS-T04-1812	K1811742-002	61	
PDI-WS-T06-1811	K1811742-003	66	
Method Blank	KQ1817708-04	46	
Lab Control Sample	KQ1817708-03	93	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM **Service Request:** K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 12/14/18
Sample Matrix: Water **Date Extracted:** 12/04/18

Lab Control Sample Summary

Butyltins

Lab Control Sample

KQ1817708-03

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

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1811742
Date Analyzed: 12/14/18 10:14
Date Extracted: 12/04/18

Method Blank Summary
Butyltins

Sample Name: Method Blank **Instrument ID:**K-GC-26
Lab Code: KQ1817708-04 **File ID:**J:\GC26\DATA\121418\1214F008.D\

Analysis Method: ALS SOP **Analysis Lot:**618770
Prep Method: EPA 3520C **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-T02-1811	K1811742-001	J:\GC26\DATA\121418\1214F019.D\	12/14/18 13:46
PDI-WS-T04-1812	K1811742-002	J:\GC26\DATA\121418\1214F020.D\	12/14/18 14:06
PDI-WS-T06-1811	K1811742-003	J:\GC26\DATA\121418\1214F021.D\	12/14/18 14:25

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1811742
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-T02-1811	K1811742-001	J:\GC26\DATA\121418\1214F019.D\	12/14/18 13:46
PDI-WS-T04-1812	K1811742-002	J:\GC26\DATA\121418\1214F020.D\	12/14/18 14:06
PDI-WS-T06-1811	K1811742-003	J:\GC26\DATA\121418\1214F021.D\	12/14/18 14:25

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553

Signal ID: RTX-1

Instrument ID: K-GC-26

#	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			

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dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553

Signal ID: RTX-1

Instrument ID: K-GC-26

Analyte Name	Compound Type	Calibration Evaluation			Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average 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

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dba ALS Environmental

QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553

Signal ID: RTX-35

Instrument ID: K-GC-26

#	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			

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
Calibration Date: 12/10/2018

Initial Calibration Summary
Butyltins

Calibration ID: KC1800553

Signal ID: RTX-35

Instrument ID: K-GC-26

Analyte Name	Compound Type	Calibration Evaluation			Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average 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

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
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

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QA/QC Report

Client: AECOM **Service Request:** K1811742
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 12/10/2018

Initial Calibration Verification Summary
Butyltins

Calibration ID: KC1800553

Signal ID: RTX-35

Instrument ID: K-GC-26

#	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: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request:K1811742

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\	ZZZZZZZ	ZZZZZZZ	12/14/2018	10:33:00	
J:\GC26\DATA\121418\1214F010.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	10:52:00	
J:\GC26\DATA\121418\1214F011.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	11:11:00	
J:\GC26\DATA\121418\1214F012.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	11:31:00	
J:\GC26\DATA\121418\1214F013.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	11:50:00	
J:\GC26\DATA\121418\1214F014.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	12:09:00	
J:\GC26\DATA\121418\1214F015.D\	ZZZZZZZ	ZZZZZZZ	12/14/2018	12:28:00	
J:\GC26\DATA\121418\1214F016.D\	ZZZZZZZ	ZZZZZZZ	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\	PDI-WS-T02-1811	K1811742-001	12/14/2018	13:46:00	
J:\GC26\DATA\121418\1214F020.D\	PDI-WS-T04-1812	K1811742-002	12/14/2018	14:06:00	
J:\GC26\DATA\121418\1214F021.D\	PDI-WS-T06-1811	K1811742-003	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: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1811742

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-T02-1811	K1811742-001	11/30/18	12/3/18	500 mL	1 mL	
PDI-WS-T04-1812	K1811742-002	12/1/18	12/3/18	500 mL	1 mL	
PDI-WS-T06-1811	K1811742-003	11/30/18	12/3/18	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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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-WS-T02-1811
Lab Code: K1811742-001
Service Request: K1811742
Date Collected: 11/30/18 15:06
Date Received: 12/03/18 12:55
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	0.14	1	12/08/18 11:30	12/4/18	
Pentachlorophenol (PCP)	ND U	1.0	0.36	1	12/08/18 11:30	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	80	35 - 132	12/08/18 11:30	
p-Terphenyl-d14	81	48 - 109	12/08/18 11:30	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-WS-T04-1812
Lab Code: K1811742-002
Service Request: K1811742
Date Collected: 12/01/18 13:10
Date Received: 12/03/18 12:55
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	0.95	0.13	1	12/08/18 11:58	12/4/18	
Pentachlorophenol (PCP)	ND U	0.95	0.34	1	12/08/18 11:58	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	76	35 - 132	12/08/18 11:58	
p-Terphenyl-d14	78	48 - 109	12/08/18 11:58	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: PDI-WS-T06-1811
Lab Code: K1811742-003
Service Request: K1811742
Date Collected: 11/30/18 16:26
Date Received: 12/03/18 12:55
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	0.14	1	12/08/18 12:27	12/4/18	
Pentachlorophenol (PCP)	ND U	1.0	0.35	1	12/08/18 12:27	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	74	35 - 132	12/08/18 12:27	
p-Terphenyl-d14	75	48 - 109	12/08/18 12:27	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ1817654-03

Service Request: K1811742
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	0.95	0.13	1	12/08/18 10:05	12/4/18	
Pentachlorophenol (PCP)	ND U	0.95	0.34	1	12/08/18 10:05	12/4/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	64	35 - 132	12/08/18 10:05	
p-Terphenyl-d14	82	48 - 109	12/08/18 10:05	

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QA/QC Report

Client: AECOM **Service Request:** K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

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-T02-1811	K1811742-001	80	81
PDI-WS-T04-1812	K1811742-002	76	78
PDI-WS-T06-1811	K1811742-003	74	75
Method Blank	KQ1817654-03	64	82
Lab Control Sample	KQ1817654-01	71	70
Duplicate Lab Control Sample	KQ1817654-02	75	78

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QA/QC Report

Client: AECOM **Service Request:**K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **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 **Lab Code:**KQ1817961-02
Analysis Method: 8270D **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	KQ1817654-03	80865	15.60	100118	12.07
Lab Control Sample	KQ1817654-01	94462	15.59	114859	12.07
Duplicate Lab Control Sample	KQ1817654-02	86609	15.59	109557	12.07
PDI-WS-T02-1811	K1811742-001	82589	15.59	107423	12.07
PDI-WS-T04-1812	K1811742-002	85531	15.59	106306	12.07
PDI-WS-T06-1811	K1811742-003	85352	15.59	108185	12.07

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QA/QC Report

Client: AECOM **Service Request:** K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 12/08/18
Sample Matrix: Water **Date Extracted:** 12/04/18

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

Analysis Method: 8270D **Units:** ug/L
Prep Method: EPA 3520C **Basis:** NA
 Analysis Lot: 618127

Lab Control Sample
KQ1817654-01 **Duplicate Lab Control Sample**
KQ1817654-02

Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Bis(2-ethylhexyl) Phthalate	3.35	5.00	67	3.15	5.00	63	42-147	6	30
Pentachlorophenol (PCP)	2.46	5.00	49	2.19	5.00	44	27-112	12	30

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Service Request: K1811742
Date Analyzed: 12/08/18 10:05
Date Extracted: 12/04/18

Method Blank Summary

Low Level Semivolatile Organic Compounds by GC/MS

Sample Name: Method Blank

Instrument ID:K-MS-29

Lab Code: KQ1817654-03

File ID:J:\MS29\DATA\120818\1208F008.D\

Analysis Method: 8270D

Analysis Lot:618127

Prep Method: EPA 3520C

Extraction Lot:327557

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1817654-01	J:\MS29\DATA\120818\1208F009.D\	12/08/18 10:33
Duplicate Lab Control Sample	KQ1817654-02	J:\MS29\DATA\120818\1208F010.D\	12/08/18 11:02
PDI-WS-T02-1811	K1811742-001	J:\MS29\DATA\120818\1208F011.D\	12/08/18 11:30
PDI-WS-T04-1812	K1811742-002	J:\MS29\DATA\120818\1208F012.D\	12/08/18 11:58
PDI-WS-T06-1811	K1811742-003	J:\MS29\DATA\120818\1208F013.D\	12/08/18 12:27

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QA/QC Report

Client: AECOM **Service Request:** K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 12/08/18 10:33
Sample Matrix: Water **Date Extracted:** 12/04/18

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

Sample Name: Lab Control Sample **Instrument ID:**K-MS-29
Lab Code: KQ1817654-01 **File ID:**J:\MS29\DATA\120818\1208F009.D\
Analysis Method: 8270D **Analysis Lot:**618127
Prep Method: EPA 3520C **Extraction Lot:**327557

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1817654-03	J:\MS29\DATA\120818\1208F008.D\	12/08/18 10:05
Duplicate Lab Control Sample	KQ1817654-02	J:\MS29\DATA\120818\1208F010.D\	12/08/18 11:02
PDI-WS-T02-1811	K1811742-001	J:\MS29\DATA\120818\1208F011.D\	12/08/18 11:30
PDI-WS-T04-1812	K1811742-002	J:\MS29\DATA\120818\1208F012.D\	12/08/18 11:58
PDI-WS-T06-1811	K1811742-003	J:\MS29\DATA\120818\1208F013.D\	12/08/18 12:27

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QC/QC Report

Client: AECOM **Service Request:**K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **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\ **Analytical Method:** 8270D
Instrument ID: K-MS-29 **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	KQ1817654-03	J:\MS29\DATA\120818\1208F008.D\	12/08/18 10:05	
Lab Control Sample	KQ1817654-01	J:\MS29\DATA\120818\1208F009.D\	12/08/18 10:33	
Duplicate Lab Control Sample	KQ1817654-02	J:\MS29\DATA\120818\1208F010.D\	12/08/18 11:02	
PDI-WS-T02-1811	K1811742-001	J:\MS29\DATA\120818\1208F011.D\	12/08/18 11:30	
PDI-WS-T04-1812	K1811742-002	J:\MS29\DATA\120818\1208F012.D\	12/08/18 11:58	
PDI-WS-T06-1811	K1811742-003	J:\MS29\DATA\120818\1208F013.D\	12/08/18 12:27	

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
Calibration Date: 11/29/2018

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

Calibration ID: KC1800541

Signal ID: 1

Instrument ID: K-MS-29

#	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

ALS Group USA, Corp.
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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
Calibration Date: 11/29/2018

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

Calibration ID: KC1800541

Signal ID: 1

Instrument ID: K-MS-29

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

ALS Group USA, Corp.
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QA/QC Report

Client:
Project:

AECOM
Portland Harbor Pre-Remedial Design Investigation

Service Request: K1811742
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

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QA/QC Report

Client: AECOM

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1811742

Date Analyzed: 12/08/18 07:15

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

Analysis Method: 8270D

Calibration Date: 11/29/2018

File ID: J:\MS29\DATA\120818\1208F002.D\

Calibration ID: KC1800541

Signal ID: 1

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

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QA/QC Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request:K1811742

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\	Method Blank	KQ1817654-03	12/8/2018	10:05:00	
J:\MS29\DATA\120818\1208F009.D\	Lab Control Sample	KQ1817654-01	12/8/2018	10:33:00	
J:\MS29\DATA\120818\1208F010.D\	Duplicate Lab Control Sample	KQ1817654-02	12/8/2018	11:02:00	
J:\MS29\DATA\120818\1208F011.D\	PDI-WS-T02-1811	K1811742-001	12/8/2018	11:30:00	
J:\MS29\DATA\120818\1208F012.D\	PDI-WS-T04-1812	K1811742-002	12/8/2018	11:58:00	
J:\MS29\DATA\120818\1208F013.D\	PDI-WS-T06-1811	K1811742-003	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\	ZZZZZZZ	ZZZZZZZ	12/8/2018	13:23:00	
J:\MS29\DATA\120818\1208F016.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	13:51:00	
J:\MS29\DATA\120818\1208F017.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	14:20:00	
J:\MS29\DATA\120818\1208F018.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	14:48:00	
J:\MS29\DATA\120818\1208F019.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	15:16:00	
J:\MS29\DATA\120818\1208F020.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	15:44:00	
J:\MS29\DATA\120818\1208F021.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	16:12:00	
J:\MS29\DATA\120818\1208F022.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	16:41:00	
J:\MS29\DATA\120818\1208F023.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	17:09:00	
J:\MS29\DATA\120818\1208F024.D\	ZZZZZZZ	ZZZZZZZ	12/8/2018	17:37:00	

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Prep Summary Report

Client: AECOM **Service Request:**K1811742
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Water

Low Level Semivolatile Organic Compounds by GC/MS

Prep Method: EPA 3520C **Extraction Lot:** 327557
Analytical Method: 8270D **Extraction Date:** 12/04/18 04:54

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-WS-T02-1811	K1811742-001	11/30/18	12/3/18	970.0000 mL	2 mL	
PDI-WS-T04-1812	K1811742-002	12/1/18	12/3/18	1050.0000	2 mL	
PDI-WS-T06-1811	K1811742-003	11/30/18	12/3/18	980.0000 mL	2 mL	
Lab Control Sample	KQ1817654-01LCS	NA	NA	1000 mL	2 mL	
Duplicate Lab Control Sample	KQ1817654-02DLCS	NA	NA	1000 mL	2 mL	
Method Blank	KQ1817654-03MB	NA	NA	1050.0000	2 mL	