



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

February 21, 2019

Analytical Report for Service Request No: K1900786

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 January 28, 2019
For your reference, these analyses have been assigned our service request number **K1900786**.

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



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

Service Request: K1900786
Date Received: 01/28/2019

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:

Four surface water samples were received for analysis at ALS Environmental on 01/28/2019. 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 02/21/2019



Chain of Custody

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K1900786

**SURFACE WATER
CHAIN OF CUSTODY**

ALS-Environmental-Kelso
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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) C _____

21 days
 Other _____

Site Contact: Jennifer Ray

Laboratory Contact: Howard-Holmes

Date: 1/28/19

Carrier: Courier

COC No: 1

1 of 1 pages

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	BEHP, Pentachlorophenol, EPA 82700-LL	Tributyltin, Unger et al.	Sample Specific Notes:
PDI-RB-PP-190127	1/27/2019	15:50	W	RB	MT	4		2	2	
PDI-WS-T 06 - 19 01	1/27/2019	10:40	W	MS/MSD	MT	12		6	6	
PDI-WS-T 07 - 19 01	1/26/2019	9:46	W		MT	4		2	2	
PDI-WS-T 07 - 19 01 - D	1/26/19	9:46	W		MT	4		2	2	

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
 Return To Client Disposal By Lab Archive For 12 Months

Special Instructions/QC Requirements & Comments:

Relinquished by:

Company: AECOM
Date/Time: 1/28/19 1152

Relinquished by:

Company: ALS
Date/Time: 1/28/19 1315

Relinquished by:

Company: ALS
Date/Time: 1/28/19 1152



PC HH

Cooler Receipt and Preservation Form

Client Accom Service Request K1900786
 Received: 1/28/19 Opened: 1/28/19 By: CG Unloaded: 1/28/19 By: CG

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- Samples were received in: (circle) Cooler Box Envelope Other NA
- Were custody seals on coolers? NA Y N If yes, how many and where? 1 Front 1 Back
 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
4.0	4.2	7.2	7.4	+0.2	323	2/3		<u>NA</u>	
3.6	3.3	6.1	5.8	-0.3	298	1/3			
2.3	2.2	4.7	4.6	-0.2	394	3/3			
				<u>-0.1</u>					

- Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 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
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- Were VOA vials received without headspace? Indicate in the table below. NA Y N
- 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: 4 of 12 bottles for PDI-WS-T06-1901 received with limited volume. Samples from coolers w/ out of temp temp blanks marked w/ red check. Includes 8/12 bottles from T06, 4/4 bottles from T07, & 4/4 bottles from T07-D.



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: Surface Water
Sample Name: PDI-RB-PP-190127
Lab Code: K1900786-001

Service Request: K1900786
Date Collected: 01/27/19 15:50
Date Received: 01/28/19 13:15

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	02/05/19 11:39	1/31/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	90	31 - 137	02/05/19 11:39	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T06-1901
Lab Code: K1900786-002

Service Request: K1900786
Date Collected: 01/27/19 10:40
Date Received: 01/28/19 13:15

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	02/05/19 11:58	1/31/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	101	31 - 137	02/05/19 11:58	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T07-1901
Lab Code: K1900786-003

Service Request: K1900786
Date Collected: 01/26/19 09:46
Date Received: 01/28/19 13:15

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	02/05/19 12:55	1/31/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	109	31 - 137	02/05/19 12:55	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T07-1901-D
Lab Code: K1900786-004

Service Request: K1900786
Date Collected: 01/26/19 09:46
Date Received: 01/28/19 13:15

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	02/05/19 13:13	1/31/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	117	31 - 137	02/05/19 13:13	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: Method Blank
Lab Code: KQ1901365-06

Service Request: K1900786
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	02/05/19 11:02	1/31/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Tri-n-propyltin	99	31 - 137	02/05/19 11:02	

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
SRM Matrix: Surface Water
Sample Name: PDI-WS-T06-1901
Lab Code: KQ1901365-01

Service Request: K1900786
Date Collected: 01/27/19 10:40
Date Received: 1/28/19

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	0.481	0.572	17		1	02/05/19 12:17

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
SRM Matrix: Surface Water
Sample Name: PDI-WS-T06-1901
Lab Code: KQ1901365-02

Service Request: K1900786
Date Collected: 01/27/19 10:40
Date Received: 1/28/19

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	0.459	0.536	15		1	02/05/19 12:36

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
SRM Matrix: Surface Water
Sample Name: Lab Control Sample
Lab Code: KQ1901365-03

Service Request: K1900786
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	0.0567	0.0669	17		1	02/05/19 10:25

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
SRM Matrix: Surface Water
Sample Name: Lab Control Sample
Lab Code: KQ1901365-04

Service Request: K1900786
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	0.0714	0.0852	18		1	02/05/19 10:44

ALS Group USA, Corp.
dba ALS Environmental

Confirmation Results

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
SRM Matrix: Surface Water
Sample Name: Lab Control Sample
Lab Code: KQ1901365-05

Service Request: K1900786
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	0.414	0.541	27		1	02/05/19 11:21

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1900786

SURROGATE RECOVERY SUMMARY

Butyltins

Analysis Method: ALS SOP
Extraction Method: EPA 3520C

Sample Name	Lab Code	Tri-n-propyltin
		31-137
PDI-RB-PP-190127	K1900786-001	90
PDI-WS-T06-1901	K1900786-002	101
PDI-WS-T07-1901	K1900786-003	109
PDI-WS-T07-1901-D	K1900786-004	117
Method Blank	KQ1901365-06	99
Lab Control Sample	KQ1901365-03	88
Lab Control Sample	KQ1901365-04	80
Lab Control Sample	KQ1901365-05	100
PDI-WS-T06-1901	KQ1901365-01	123
PDI-WS-T06-1901	KQ1901365-02	95

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1900786
Date Collected: 01/27/19
Date Received: 01/28/19
Date Analyzed: 02/5/19
Date Extracted: 01/31/19

Duplicate Matrix Spike Summary
Butyltins

Sample Name: PDI-WS-T06-1901
Lab Code: K1900786-002
Analysis Method: ALS SOP
Prep Method: EPA 3520C

Units: ug/L
Basis: NA

Analyte Name	Sample Result	Result	Matrix Spike KQ1901365-01		Duplicate Matrix Spike KQ1901365-02		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Tri-n-butyltin Cation	ND U	0.481	0.446	108	0.459	0.446	103	17-142	5	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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dba ALS Environmental

QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19
Date Extracted: 01/31/19

Lab Control Sample Summary
Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Units: ug/L
Basis: NA
Analysis Lot: 624179

Lab Control Sample
KQ1901365-03

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Tri-n-butyltin Cation	0.0567	0.0676	84	32-122

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19
Date Extracted: 01/31/19

Lab Control Sample Summary
Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Units: ug/L
Basis: NA
Analysis Lot: 624179

Lab Control Sample
KQ1901365-04

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Tri-n-butyltin Cation	0.0714	0.0890	80	32-122

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

Service Request: K1900786
Date Analyzed: 02/05/19
Date Extracted: 01/31/19

Lab Control Sample Summary
Butyltins

Analysis Method: ALS SOP
Prep Method: EPA 3520C

Units: ug/L
Basis: NA
Analysis Lot: 624179

Lab Control Sample
KQ1901365-05

<u>Analyte Name</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Tri-n-butyltin Cation	0.414	0.446	93	32-122

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 11:02
Date Extracted: 01/31/19

Method Blank Summary
Butyltins

Sample Name: Method Blank
Lab Code: KQ1901365-06
Analysis Method: ALS SOP
Prep Method: EPA 3520C

Instrument ID: K-GC-26
File ID: J:\GC26\DATA\020519\0205F010.D\
Analysis Lot: 624179
Extraction Lot: 330722

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1901365-03	J:\GC26\DATA\020519\0205F008.D\	02/05/19 10:25
Lab Control Sample	KQ1901365-04	J:\GC26\DATA\020519\0205F009.D\	02/05/19 10:44
Lab Control Sample	KQ1901365-05	J:\GC26\DATA\020519\0205F011.D\	02/05/19 11:21
PDI-RB-PP-190127	K1900786-001	J:\GC26\DATA\020519\0205F012.D\	02/05/19 11:39
PDI-WS-T06-1901	K1900786-002	J:\GC26\DATA\020519\0205F013.D\	02/05/19 11:58
PDI-WS-T06-1901MS	KQ1901365-01	J:\GC26\DATA\020519\0205F014.D\	02/05/19 12:17
PDI-WS-T06-1901DMS	KQ1901365-02	J:\GC26\DATA\020519\0205F015.D\	02/05/19 12:36
PDI-WS-T07-1901	K1900786-003	J:\GC26\DATA\020519\0205F016.D\	02/05/19 12:55
PDI-WS-T07-1901-D	K1900786-004	J:\GC26\DATA\020519\0205F017.D\	02/05/19 13:13

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dba ALS Environmental

QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 11:21
Date Extracted: 01/31/19

Lab Control Sample Summary
Butyltins

Sample Name: Lab Control Sample **Instrument ID:** K-GC-26
Lab Code: KQ1901365-05 **File ID:** J:\GC26\DATA\020519\0205F011.D\
Analysis Method: ALS SOP **Analysis Lot:** 624179
Prep Method: EPA 3520C **Extraction Lot:** 330722

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1901365-06	J:\GC26\DATA\020519\0205F010.D\	02/05/19 11:02
PDI-RB-PP-190127	K1900786-001	J:\GC26\DATA\020519\0205F012.D\	02/05/19 11:39
PDI-WS-T06-1901	K1900786-002	J:\GC26\DATA\020519\0205F013.D\	02/05/19 11:58
PDI-WS-T06-1901MS	KQ1901365-01	J:\GC26\DATA\020519\0205F014.D\	02/05/19 12:17
PDI-WS-T06-1901DMS	KQ1901365-02	J:\GC26\DATA\020519\0205F015.D\	02/05/19 12:36
PDI-WS-T07-1901	K1900786-003	J:\GC26\DATA\020519\0205F016.D\	02/05/19 12:55
PDI-WS-T07-1901-D	K1900786-004	J:\GC26\DATA\020519\0205F017.D\	02/05/19 13:13

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 11:21
Date Extracted: 01/31/19

Lab Control Sample Summary
Butyltins

Sample Name: Lab Control Sample **Instrument ID:** K-GC-26
Lab Code: KQ1901365-05 **File ID:** J:\GC26\DATA\020519\0205F011.D\
Analysis Method: ALS SOP **Analysis Lot:** 624179
Prep Method: EPA 3520C **Extraction Lot:** 330722

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1901365-06	J:\GC26\DATA\020519\0205F010.D\	02/05/19 11:02
PDI-RB-PP-190127	K1900786-001	J:\GC26\DATA\020519\0205F012.D\	02/05/19 11:39
PDI-WS-T06-1901	K1900786-002	J:\GC26\DATA\020519\0205F013.D\	02/05/19 11:58
PDI-WS-T06-1901MS	KQ1901365-01	J:\GC26\DATA\020519\0205F014.D\	02/05/19 12:17
PDI-WS-T06-1901DMS	KQ1901365-02	J:\GC26\DATA\020519\0205F015.D\	02/05/19 12:36
PDI-WS-T07-1901	K1900786-003	J:\GC26\DATA\020519\0205F016.D\	02/05/19 12:55
PDI-WS-T07-1901-D	K1900786-004	J:\GC26\DATA\020519\0205F017.D\	02/05/19 13:13

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 11:21
Date Extracted: 01/31/19

Lab Control Sample Summary

Butyltins

Sample Name: Lab Control Sample

Instrument ID:K-GC-26

Lab Code: KQ1901365-05

File ID:J:\GC26\DATA\020519\0205F011.D\

Analysis Method: ALS SOP

Analysis Lot:624179

Prep Method: EPA 3520C

Extraction Lot:330722

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1901365-06	J:\GC26\DATA\020519\0205F010.D\	02/05/19 11:02
PDI-RB-PP-190127	K1900786-001	J:\GC26\DATA\020519\0205F012.D\	02/05/19 11:39
PDI-WS-T06-1901	K1900786-002	J:\GC26\DATA\020519\0205F013.D\	02/05/19 11:58
PDI-WS-T06-1901MS	KQ1901365-01	J:\GC26\DATA\020519\0205F014.D\	02/05/19 12:17
PDI-WS-T06-1901DMS	KQ1901365-02	J:\GC26\DATA\020519\0205F015.D\	02/05/19 12:36
PDI-WS-T07-1901	K1900786-003	J:\GC26\DATA\020519\0205F016.D\	02/05/19 12:55
PDI-WS-T07-1901-D	K1900786-004	J:\GC26\DATA\020519\0205F017.D\	02/05/19 13:13

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QA/QC Report

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

Service Request: K1900786
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: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1900786
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	

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QA/QC Report

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

Service Request: K1900786
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: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1900786
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	

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QA/QC Report

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

Service Request: K1900786
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
Project: Portland Harbor Pre-Remedial Design Investigation

Service Request: K1900786
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: Portland Harbor Pre-Remedial Design Investigation/60566335

Service Request: K1900786
Date Analyzed: 02/05/19 09:30

Continuing Calibration Verification (CCV) Summary
Butyltins

Analysis Method: ALS SOP
File ID: J:\GC26\DATA\020519\0205F005.D\
Signal ID: RTX-35

Calibration Date: 12/10/2018
Calibration ID: KC1800553
Analysis Lot: 624179
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-butyltin Cation	44.6	43.5	8.445E4	8.248E4	-2.3	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-propyltin	50.0	59.8	6.026E4	7.202E4	19.5	NA	±25	Average RF

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 09:30

Continuing Calibration Verification (CCV) Summary
Butyltins

Analysis Method: ALS SOP
File ID: J:\GC26\DATA\020519\0205F005.D\
Signal ID: RTX-1

Calibration Date: 12/10/2018
Calibration ID: KC1800553
Analysis Lot: 624179
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-butyltin Cation	44.6	45.3	5.53E4	5.623E4	1.7	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-propyltin	50.0	55.0	4.12E4	4.534E4	10.0	NA	±25	Average RF

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 13:51

Continuing Calibration Verification (CCV) Summary
Butyltins

Analysis Method: ALS SOP
File ID: J:\GC26\DATA\020519\0205F019.D\
Signal ID: RTX-35

Calibration Date: 12/10/2018
Calibration ID: KC1800553
Analysis Lot: 624179
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-butyltin Cation	44.6	48.1	8.445E4	9.118E4	8.0	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-propyltin	50.0	58.7	6.026E4	7.075E4	17.4	NA	±25	Average RF

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/05/19 13:51

Continuing Calibration Verification (CCV) Summary
Butyltins

Analysis Method: ALS SOP
File ID: J:\GC26\DATA\020519\0205F019.D\
Signal ID: RTX-1

Calibration Date: 12/10/2018
Calibration ID: KC1800553
Analysis Lot: 624179
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-butyltin Cation	44.6	51.3	5.53E4	6.373E4	15.2	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Tri-n-propyltin	50.0	58.9	4.12E4	4.858E4	17.9	NA	±25	Average RF

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QA/QC Report

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

Service Request:K1900786

Analysis Run Log
Butyltins

Analysis Method: ALS SOP

Analysis Lot:624179
Instrument ID:K-GC-26

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\GC26\DATA\020519\0205F005.D\	Continuing Calibration Verification	KQ1901549-01	2/5/2019	09:30:00	
J:\GC26\DATA\020519\0205F006.D\	ZZZZZZZ	ZZZZZZZ	2/5/2019	09:48:00	
J:\GC26\DATA\020519\0205F008.D\	Lab Control Sample	KQ1901365-03	2/5/2019	10:25:00	
J:\GC26\DATA\020519\0205F009.D\	Lab Control Sample	KQ1901365-04	2/5/2019	10:44:00	
J:\GC26\DATA\020519\0205F010.D\	Method Blank	KQ1901365-06	2/5/2019	11:02:00	
J:\GC26\DATA\020519\0205F011.D\	Lab Control Sample	KQ1901365-05	2/5/2019	11:21:00	
J:\GC26\DATA\020519\0205F012.D\	PDI-RB-PP-190127	K1900786-001	2/5/2019	11:39:00	
J:\GC26\DATA\020519\0205F013.D\	PDI-WS-T06-1901	K1900786-002	2/5/2019	11:58:00	
J:\GC26\DATA\020519\0205F014.D\	PDI-WS-T06-1901 MS	KQ1901365-01	2/5/2019	12:17:00	
J:\GC26\DATA\020519\0205F015.D\	PDI-WS-T06-1901 DMS	KQ1901365-02	2/5/2019	12:36:00	
J:\GC26\DATA\020519\0205F016.D\	PDI-WS-T07-1901	K1900786-003	2/5/2019	12:55:00	
J:\GC26\DATA\020519\0205F017.D\	PDI-WS-T07-1901-D	K1900786-004	2/5/2019	13:13:00	
J:\GC26\DATA\020519\0205F018.D\	ZZZZZZZ	ZZZZZZZ	2/5/2019	13:32:00	
J:\GC26\DATA\020519\0205F019.D\	Continuing Calibration Verification	KQ1901549-02	2/5/2019	13:51:00	
J:\GC26\DATA\020519\0205F020.D\	ZZZZZZZ	ZZZZZZZ	2/5/2019	14:10:00	

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Prep Summary Report

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

Service Request:K1900786

Butyltins

Prep Method: EPA 3520C
Analytical Method: ALS SOP

Extraction Lot: 330722
Extraction Date: 01/31/19 18:13

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-RB-PP-190127	K1900786-001	1/27/19	1/28/19	500 mL	1 mL	
PDI-WS-T06-1901	K1900786-002	1/27/19	1/28/19	500 mL	1 mL	
PDI-WS-T07-1901	K1900786-003	1/26/19	1/28/19	500 mL	1 mL	
PDI-WS-T07-1901-D	K1900786-004	1/26/19	1/28/19	500 mL	1 mL	
Matrix Spike	KQ1901365-01MS	1/27/19	1/28/19	500 mL	1 mL	
Duplicate Matrix Spike	KQ1901365-02DMS	1/27/19	1/28/19	500 mL	1 mL	
Lab Control Sample	KQ1901365-03LCS	NA	NA	500 mL	1 mL	
Lab Control Sample	KQ1901365-04LCS	NA	NA	500 mL	1 mL	
Lab Control Sample	KQ1901365-05LCS	NA	NA	500 mL	1 mL	
Method Blank	KQ1901365-06MB	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
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www.alsglobal.com

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-RB-PP-190127
Lab Code: K1900786-001

Service Request: K1900786
Date Collected: 01/27/19 15:50
Date Received: 01/28/19 13:15

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	0.19 J	0.96	0.13	1	02/01/19 17:38	1/29/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
p-Terphenyl-d14	64	48 - 109	02/01/19 17:38	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T06-1901
Lab Code: K1900786-002

Service Request: K1900786
Date Collected: 01/27/19 10:40
Date Received: 01/28/19 13:15

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	0.19 J	1.1	0.15	1	02/01/19 18:06	1/29/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
p-Terphenyl-d14	63	48 - 109	02/01/19 18:06	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T07-1901
Lab Code: K1900786-003

Service Request: K1900786
Date Collected: 01/26/19 09:46
Date Received: 01/28/19 13:15

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	0.37 J	0.95	0.13	1	02/01/19 18:34	1/29/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
p-Terphenyl-d14	61	48 - 109	02/01/19 18:34	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: PDI-WS-T07-1901-D
Lab Code: K1900786-004

Service Request: K1900786
Date Collected: 01/26/19 09:46
Date Received: 01/28/19 13:15

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	0.25 J	0.95	0.13	1	02/01/19 19:03	1/29/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
p-Terphenyl-d14	60	48 - 109	02/01/19 19:03	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Surface Water
Sample Name: Method Blank
Lab Code: KQ1901166-04

Service Request: K1900786
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	02/01/19 15:44	1/29/19	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
p-Terphenyl-d14	70	48 - 109	02/01/19 15:44	

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QA/QC Report

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

Service Request: K1900786

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

Analysis Method: 8270D
Extraction Method: EPA 3520C

Sample Name	Lab Code	p-Terphenyl-d14
		48-109
PDI-RB-PP-190127	K1900786-001	64
PDI-WS-T06-1901	K1900786-002	63
PDI-WS-T07-1901	K1900786-003	61
PDI-WS-T07-1901-D	K1900786-004	60
Method Blank	KQ1901166-04	70
Lab Control Sample	KQ1901166-03	70
PDI-WS-T06-1901	KQ1901166-01	62
PDI-WS-T06-1901	KQ1901166-02	59

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QA/QC Report

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

Service Request:K1900786
Date Analyzed:02/01/19 11:56

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

File ID: J:\MS29\DATA\020119\0201F002.D\
Instrument ID: K-MS-29
Analysis Method: 8270D

Lab Code:KQ1901556-02
Analysis Lot:624290
Signal ID:1

	Chrysene-d12	
	Area	RT
Result ==>	108,936	15.32
Upper Limit ==>	217,872	15.82
Lower Limit ==>	54,468	14.82

Associated Analyses

Method Blank	KQ1901166-04	96443	15.32
Lab Control Sample	KQ1901166-03	99237	15.32
PDI-WS-T06-1901MS	KQ1901166-01	117522	15.32
PDI-WS-T06-1901DMS	KQ1901166-02	116342	15.32
PDI-RB-PP-190127	K1900786-001	97184	15.31
PDI-WS-T06-1901	K1900786-002	110341	15.32
PDI-WS-T07-1901	K1900786-003	108174	15.31
PDI-WS-T07-1901-D	K1900786-004	106011	15.31

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QA/QC Report

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

Service Request: K1900786
Date Collected: 01/27/19
Date Received: 01/28/19
Date Analyzed: 02/1/19
Date Extracted: 01/29/19

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

Sample Name: PDI-WS-T06-1901
Lab Code: K1900786-002
Analysis Method: 8270D
Prep Method: EPA 3520C

Units: ug/L
Basis: NA

Analyte Name	Sample Result	Result	Matrix Spike KQ1901166-01		Duplicate Matrix Spike KQ1901166-02		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
Bis(2-ethylhexyl) Phthalate	0.19 J	2.55	5.00	47	2.47	5.00	46	10-171	3	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 **Service Request:** K1900786
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 02/01/19
Sample Matrix: Surface Water **Date Extracted:** 01/29/19

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: 624290

Lab Control Sample
KQ1901166-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
Bis(2-ethylhexyl) Phthalate	3.64	5.00	73	42-147

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/01/19 16:12
Date Extracted: 01/29/19

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

Sample Name: Lab Control Sample **Instrument ID:** K-MS-29
Lab Code: KQ1901166-03 **File ID:** J:\MS29\DATA\020119\0201F011.D\
Analysis Method: 8270D **Analysis Lot:** 624290
Prep Method: EPA 3520C **Extraction Lot:** 330493

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1901166-04	J:\MS29\DATA\020119\0201F010.D\	02/01/19 15:44
PDI-WS-T06-1901MS	KQ1901166-01	J:\MS29\DATA\020119\0201F012.D\	02/01/19 16:41
PDI-WS-T06-1901DMS	KQ1901166-02	J:\MS29\DATA\020119\0201F013.D\	02/01/19 17:09
PDI-RB-PP-190127	K1900786-001	J:\MS29\DATA\020119\0201F014.D\	02/01/19 17:38
PDI-WS-T06-1901	K1900786-002	J:\MS29\DATA\020119\0201F015.D\	02/01/19 18:06
PDI-WS-T07-1901	K1900786-003	J:\MS29\DATA\020119\0201F016.D\	02/01/19 18:34
PDI-WS-T07-1901-D	K1900786-004	J:\MS29\DATA\020119\0201F017.D\	02/01/19 19:03

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QC/QC Report

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

Service Request: K1900786
Date Analyzed: 02/01/19 11:28

Tune Summary
Low Level Semivolatile Organic Compounds by GC/MS

File ID: J:\MS29\DATA\020119\0201F001.D\
Instrument ID: K-MS-29

Analytical Method: 8270D
Analysis Lot: 624290

Target Mass	Relative to Mass	Lower Limit %	Upper Limit %	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	42.78	261696	Pass
68	69	0	2	0.00	0	Pass
69	198	0	100	45.75	279850	Pass
70	69	0	2	0.49	1364	Pass
127	198	10	80	48.12	294357	Pass
197	198	0	2	0.00	0	Pass
198	442	30	100	79.08	611733	Pass
199	198	5	9	6.85	41920	Pass
275	198	10	60	30.43	186149	Pass
365	442	1	50	2.34	18136	Pass
441	443	0.01	100	86.96	130728	Pass
442	442	30	100	100.00	773568	Pass
443	442	15	24	19.43	150325	Pass

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1901556-02	J:\MS29\DATA\020119\0201F002.D\	02/01/19 11:56	
Method Blank	KQ1901166-04	J:\MS29\DATA\020119\0201F010.D\	02/01/19 15:44	
Lab Control Sample	KQ1901166-03	J:\MS29\DATA\020119\0201F011.D\	02/01/19 16:12	
PDI-WS-T06-1901	KQ1901166-01	J:\MS29\DATA\020119\0201F012.D\	02/01/19 16:41	
PDI-WS-T06-1901	KQ1901166-02	J:\MS29\DATA\020119\0201F013.D\	02/01/19 17:09	
PDI-RB-PP-190127	K1900786-001	J:\MS29\DATA\020119\0201F014.D\	02/01/19 17:38	
PDI-WS-T06-1901	K1900786-002	J:\MS29\DATA\020119\0201F015.D\	02/01/19 18:06	
PDI-WS-T07-1901	K1900786-003	J:\MS29\DATA\020119\0201F016.D\	02/01/19 18:34	
PDI-WS-T07-1901-D	K1900786-004	J:\MS29\DATA\020119\0201F017.D\	02/01/19 19:03	

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QA/QC Report

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

Service Request: K1900786
Calibration Date: 1/7/2019

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

Calibration ID: KC1900016
Instrument ID: K-MS-29

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1900016-01	SVO_LL ICAL @ 0.05ppm SVM59-69C	J:\MS29\DATA\010719\0107F003.D	01/07/2019 18:20
02	KC1900016-02	SVO_LL ICAL @ 0.10ppm SVM59-69D	J:\MS29\DATA\010719\0107F004.D	01/07/2019 18:48
03	KC1900016-03	SVO_LL ICAL @ 0.20ppm SVM59-69E	J:\MS29\DATA\010719\0107F005.D	01/07/2019 19:17
04	KC1900016-04	SVO_LL ICAL @ 0.50ppm SVM59-69F	J:\MS29\DATA\010719\0107F006.D	01/07/2019 19:45
05	KC1900016-05	SVO_LL ICAL @ 1.0ppm SVM59-69G	J:\MS29\DATA\010719\0107F007.D	01/07/2019 20:13
06	KC1900016-06	SVO_LL ICAL @ 2.0ppm SVM59-69H	J:\MS29\DATA\010719\0107F008.D	01/07/2019 20:41
07	KC1900016-07	SVO_LL ICAL @ 3.0ppm SVM59-69I	J:\MS29\DATA\010719\0107F009.D	01/07/2019 21:09
08	KC1900016-08	SVO_LL ICAL @ 5.0ppm SVM59-69J	J:\MS29\DATA\010719\0107F010.D	01/07/2019 21:38
09	KC1900016-09	SVO_LL ICAL @ 7.0ppm SVM59-69K	J:\MS29\DATA\010719\0107F011.D	01/07/2019 22:06
10	KC1900016-10	SVO_LL ICAL @ 10ppm SVM59-69L	J:\MS29\DATA\010719\0107F012.D	01/07/2019 22:34

Analyte

Bis(2-ethylhexyl) Phthalate

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	100.000	0.4959	03	200.000	0.4777	04	500.000	0.6548	05	1000.000	0.7132
06	2000.000	0.8334	07	3000.000	0.8915	08	5000.000	0.9172	09	7000.000	0.8954
10	10000.000	0.9032									

p-Terphenyl-d14

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
03	200.000	1.019	04	500.000	0.9833	05	1000.000	0.9493	06	2000.000	0.9903
07	3000.000	1.011	08	5000.000	1.012	09	7000.000	0.9359	10	10000.000	0.9296

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

Service Request: K1900786
Calibration Date: 1/7/2019

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

Calibration ID: KC1900016
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
Bis(2-ethylhexyl) Phthalate	TRG	Quadratic	COD	0.9991	0.990	0.7536	0.010
p-Terphenyl-d14	SURR	Average RF	% RSD	3.7	20	0.9788	0.010

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QA/QC Report

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

Service Request: K1900786
Calibration Date: 1/7/2019

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

Calibration ID: KC1900016
Instrument ID: K-MS-29

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1900016-11	SVO_LL ICV @ 3.0ppm SVM59-63B	J:\MS29\DATA\010719\0107F013.D	01/07/2019 23:02

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
Bis(2-ethylhexyl) Phthalate	3000	2770	7.536E-1	7.929E-1	-7.823	±30	Quadratic

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
p-Terphenyl-d14	3000	2810	9.788E-1	9.175E-1	-6.263	±30	Average RF

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QA/QC Report

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

Service Request: K1900786
Date Analyzed: 02/01/19 11:56

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

Analysis Method: 8270D
File ID: J:\MS29\DATA\020119\0201F002.D\
Signal ID: 1

Calibration Date: 1/7/2019
Calibration ID: KC1900016
Analysis Lot: 624290
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
Bis(2-ethylhexyl) Phthalate	3000	2400	0.7536	0.6849	NA	-19.9	±20	Quadratic

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
p-Terphenyl-d14	3000	2610	0.9788	0.8527	-12.9	NA	±20	Average RF

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QA/QC Report

Client: AECOM

Service Request:K1900786

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

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

Analysis Method:

Analysis Lot:624290

Instrument ID:K-MS-29

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\MS29\DATA\020119\0201F001.D\	ZZZZZZZ	ZZZZZZZ	2/1/2019	11:28:00	
J:\MS29\DATA\020119\0201F002.D\	Continuing Calibration Verification	KQ1901556-02	2/1/2019	11:56:00	
J:\MS29\DATA\020119\0201F010.D\	Method Blank	KQ1901166-04	2/1/2019	15:44:00	
J:\MS29\DATA\020119\0201F011.D\	Lab Control Sample	KQ1901166-03	2/1/2019	16:12:00	
J:\MS29\DATA\020119\0201F012.D\	PDI-WS-T06-1901 MS	KQ1901166-01	2/1/2019	16:41:00	
J:\MS29\DATA\020119\0201F013.D\	PDI-WS-T06-1901 DMS	KQ1901166-02	2/1/2019	17:09:00	
J:\MS29\DATA\020119\0201F014.D\	PDI-RB-PP-190127	K1900786-001	2/1/2019	17:38:00	
J:\MS29\DATA\020119\0201F015.D\	PDI-WS-T06-1901	K1900786-002	2/1/2019	18:06:00	
J:\MS29\DATA\020119\0201F016.D\	PDI-WS-T07-1901	K1900786-003	2/1/2019	18:34:00	
J:\MS29\DATA\020119\0201F017.D\	PDI-WS-T07-1901-D	K1900786-004	2/1/2019	19:03:00	

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Prep Summary Report

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

Service Request:K1900786

Low Level Semivolatile Organic Compounds by GC/MS

Prep Method: EPA 3520C
Analytical Method: 8270D

Extraction Lot: 330493
Extraction Date: 01/29/19 08:00

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-RB-PP-190127	K1900786-001	1/27/19	1/28/19	1040.0000	2 mL	
PDI-WS-T06-1901	K1900786-002	1/27/19	1/28/19	880.0000 mL	2 mL	
PDI-WS-T07-1901	K1900786-003	1/26/19	1/28/19	1050.0000	2 mL	
PDI-WS-T07-1901-D	K1900786-004	1/26/19	1/28/19	1050.0000	2 mL	
Matrix Spike	KQ1901166-01MS	1/27/19	1/28/19	1000 mL	2 mL	
Duplicate Matrix Spike	KQ1901166-02DMS	1/27/19	1/28/19	1000 mL	2 mL	
Lab Control Sample	KQ1901166-03LCS	NA	NA	1000 mL	2 mL	
Method Blank	KQ1901166-04MB	NA	NA	1050.0000	2 mL	