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July 30, 2018

Analytical Report for Service Request No: K1804531B

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 May 14, 2018
For your reference, these analyses have been assigned our service request number **K1804531.**

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

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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.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/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation
Sample Matrix: Sediment

Service Request: K1804531
Date Received: 05/14/2018

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:

Two sediment samples were received for analysis at ALS Environmental on 05/14/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Semivolatiles by GC/MS:

Method 8270D, Organochlorine Pesticides by GC/MS/MS 06/24/2018: The spike recovery of Heptachlor for the Continuing Calibration Verification (CCV) (-46, 25), Matrix Spikes KQ1806350-01/02 (61, 54, 76-117) and Laboratory Control Sample (LCS) KQ1806350-03 (51, 81-114) was outside the lower control criterion. The analyte in question was not detected in the associated field samples. The error associated with reduced recovery indicated a potential low bias. The data was flagged to indicate the problem.

Method 8270D, Organochlorine Pesticides by GC/MS/MS 06/24/2018: The Relative Percent Difference (RPD) for gamma-Chlordane in the replicate matrix spike analyses of sample Batch QC was outside control criteria:41, 40. All spike recoveries in the MS, DMS, and associated Laboratory Control Sample (LCS) were within acceptance limits, indicating the analytical batch was in control. No further corrective action was appropriate.

Method 8270D, Organochlorine Pesticides by GC/MS/MS 06/24/2018: The upper control criterion was exceeded for cis-Nonachlor in the Matrix Spikes KQ1806350-01/02 (157, 239, 27-144) and Laboratory Control Sample (LCS) KQ1806350-03 (140, 69-134). The analyt in question was not detected in the associated field samples. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method 8270D, Organochlorine Pesticides by GC/MS/MS 06/24/2018: The upper control criterion was exceeded for the following analytes in Matrix Spike (MS/DMS) KQ1806350-01/02: 2,4'-DDT, alpha-Chlordane, and trans-Nonachlor. The analytes in question were not detected in the associated field samples above the MRL. cis-Nonachlor and trans-nonachlor also had elevated RPD values for the MS/MSD, (41,61, 40). The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. No further corrective action was appropriate.

Method 8270D SIM-PAH, 06/14-16/2018:The matrix spike recovery of several analytes for sample Batch QC were outside the ALS control criteria as a result of the heterogeneous character of the sample. The Relative Percent Difference (RPD) for the replicate analysis supported this. Since the unspiked samples contained high analyte concentrations relative to the amount spiked, the variability between replicates was sufficient to bias the percent recoveries outside normal ALS control criteria. The associated QA/QC results (e.g. control sample, calibration standards, etc.) indicated the analysis was in control. No further corrective action was appropriate.

Semivoa GC:

No significant anomalies were noted with this analysis.

Approved by _____ Date 07/30/2018

Chain of Custody

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K1804531

ALS-Environmental-Kelso 1317-S-13th-Ave Kelso, WA 98626 Ph: 360-577-7222 Fax: 360-636-1068	**SURFACE SEDIMENT CHAIN OF CUSTODY**			
Client Contact	**Project Contact: Amy Dahl / Chelsey Cook**	**Site Contact: Jennifer Ray**	**5/11/2018**	COC No: 2
AECOM	**Tel: (206) 438-2261 / (206) 438-2010**	**Laboratory Contact: Howard-Holmes**	**Carrier: Courier**	1 of 1 COCs
1111 3rd Ave Suite 1600	**Analysis Turnaround Time**			
Seattle, WA 98101	Calendar (C) or Work Days (W) _____			
Phone: (206) 438-2700 Fax: 1+(866) 495-5288	[x] 21 days			
Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	[ ] Other _____			
Portland, OR				
Project #: 60566335 Study: Surface Sediment				

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	Pesticides, PAHs, Total Solids, BEHP, Tributyltin 1669M, 8270-SIM, 160.3, 8270-LL, Krom/Unger	Sample Specific Notes:
PDI-SG-B077-BL1	5/11/2018	10:50	SS		AM	1		X	
PDI-SG-B380-BL1	5/13/2018	10:45	SS		ED	1		X	

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* [X] *Disposal By Lab* [X] *Archive For 12 Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	5-14-18 1140	[signature]	HWR	5/14/18 1140
[signature]	HWR	5/14/18 1500	[signature]	ALS	5/14/18 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

ALS

PC H2

Cooler Receipt and Preservation Form

Client AECOM Service Request *K18* 04531

Received: 5/14/18 Opened: 5/14/18 By: Unloaded: 5/14/18 By:

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? one, 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 (NA)	Tracking Number (NA)	Filed
4.0	4.0	2.1	2.1	0	384	1+2		
5.6	5.7	10.9	11.0	+0.1	376			

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

Total Solids

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Analytical Report

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/11/18 - 05/13/18
Sample Matrix:	Sediment	**Date Received:**	05/14/18
Analysis Method:	160.3 Modified	**Units:**	Percent
Prep Method:	None	**Basis:**	As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
PDI-SG-B077-BL1	K1804531-001	**37.9**	-	-	1	05/15/18 10:58	
PDI-SG-B380-BL1	K1804531-002	**54.8**	-	-	1	05/15/18 10:58	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	AECOM	**Service Request:**	K1804531
Project	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/11/18
Sample Matrix:	Sediment	**Date Received:**	05/14/18
		Date Analyzed:	05/15/18

Replicate Sample Summary
Inorganic Parameters

Sample Name:	PDI-SG-B077-BL1	**Units:**	Percent
Lab Code:	K1804531-001	**Basis:**	As Received

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1804531-001DUP Result	Average	RPD	RPD Limit
Solids, Total	160.3 Modified	-	-	37.9	38.0	38.0	<1	20

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.

Organochlorine Pesticides

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Analytical Report

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/11/18 10:50
Sample Matrix:	Sediment	**Date Received:**	05/14/18 15:00
Sample Name:	PDI-SG-B077-BL1	**Units:**	ug/Kg
Lab Code:	K1804531-001	**Basis:**	Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	**0.63**	**J**	0.66	0.42	5	06/24/18 17:13	5/18/18	
2,4'-DDE	ND	U	0.66	0.52	5	06/24/18 17:13	5/18/18	
2,4'-DDT	ND	U	0.66	0.62	5	06/24/18 17:13	5/18/18	
4,4'-DDD	**1.3**		0.66	0.23	5	06/24/18 17:13	5/18/18	
4,4'-DDE	**2.9**		0.66	0.46	5	06/24/18 17:13	5/18/18	
4,4'-DDT	**0.48**	**J**	0.66	0.31	5	06/24/18 17:13	5/18/18	
Aldrin	ND	U	0.66	0.52	5	06/24/18 17:13	5/18/18	
alpha-Chlordane	ND	U	1.3	0.41	5	06/24/18 17:13	5/18/18	
cis-Nonachlor	ND	U	0.66	0.64	5	06/24/18 17:13	5/18/18	*
Dieldrin	ND	U	1.3	0.51	5	06/24/18 17:13	5/18/18	
gamma-BHC (Lindane)	ND	U	0.66	0.21	5	06/24/18 17:13	5/18/18	
gamma-Chlordane	ND	U	1.3	0.42	5	06/24/18 17:13	5/18/18	
Heptachlor	ND	U	0.66	0.26	5	06/24/18 17:13	5/18/18	*
trans-Nonachlor	ND	U	1.3	0.39	5	06/24/18 17:13	5/18/18	

Analytical Report

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/13/18 10:45
Sample Matrix:	Sediment	**Date Received:**	05/14/18 15:00
Sample Name:	PDI-SG-B380-BL1	**Units:**	ug/Kg
Lab Code:	K1804531-002	**Basis:**	Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result		MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	**3.6**		0.46	0.32	5	06/24/18 17:40	5/18/18	
2,4'-DDE	**0.90**		0.46	0.40	5	06/24/18 17:40	5/18/18	
2,4'-DDT	ND	U	0.47	0.47	5	06/24/18 17:40	5/18/18	
4,4'-DDD	**9.3**		0.46	0.18	5	06/24/18 17:40	5/18/18	
4,4'-DDE	**9.8**		0.46	0.35	5	06/24/18 17:40	5/18/18	
4,4'-DDT	**0.93**		0.46	0.24	5	06/24/18 17:40	5/18/18	
Aldrin	ND	U	0.46	0.40	5	06/24/18 17:40	5/18/18	
alpha-Chlordane	**0.66**	**J**	0.91	0.31	5	06/24/18 17:40	5/18/18	
cis-Nonachlor	ND	U	0.49	0.49	5	06/24/18 17:40	5/18/18	*
Dieldrin	ND	U	1.0	0.39	5	06/24/18 17:40	5/18/18	
gamma-BHC (Lindane)	**0.21**	**J**	0.46	0.16	5	06/24/18 17:40	5/18/18	
gamma-Chlordane	**1.2**		0.91	0.32	5	06/24/18 17:40	5/18/18	
Heptachlor	ND	U	0.46	0.20	5	06/24/18 17:40	5/18/18	*
trans-Nonachlor	**0.52**	**J**	0.91	0.29	5	06/24/18 17:40	5/18/18	

Analytical Report

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KQ1806350-04	**Basis:**	Dry

Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Prep Method: EPA 3541

Analyte Name	Result	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4'-DDD	ND U	0.063	0.063	1	06/24/18 15:25	5/18/18	
2,4'-DDE	ND U	0.079	0.079	1	06/24/18 15:25	5/18/18	
2,4'-DDT	ND U	0.094	0.094	1	06/24/18 15:25	5/18/18	
4,4'-DDD	ND U	0.049	0.035	1	06/24/18 15:25	5/18/18	
4,4'-DDE	ND U	0.070	0.070	1	06/24/18 15:25	5/18/18	
4,4'-DDT	ND U	0.049	0.047	1	06/24/18 15:25	5/18/18	
Aldrin	ND U	0.079	0.079	1	06/24/18 15:25	5/18/18	
alpha-Chlordane	ND U	0.098	0.062	1	06/24/18 15:25	5/18/18	
cis-Nonachlor	ND U	0.097	0.097	1	06/24/18 15:25	5/18/18	
Dieldrin	ND U	0.20	0.077	1	06/24/18 15:25	5/18/18	
gamma-BHC (Lindane)	ND U	0.049	0.031	1	06/24/18 15:25	5/18/18	
gamma-Chlordane	ND U	0.098	0.064	1	06/24/18 15:25	5/18/18	
Heptachlor	ND U	0.049	0.039	1	06/24/18 15:25	5/18/18	
trans-Nonachlor	ND U	0.098	0.058	1	06/24/18 15:25	5/18/18	

Client: AECOM **Service Request:** K1804531

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Sample Matrix: Sediment

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Extraction Method: EPA 3541

Sample Name	Lab Code	S_4,4'DDD-d4 5-120	S_4,4'-DDT-d4 13-200	S_Aldrin-13C12 10-143
Batch QC	K1804532-009	61	54	54

Client: AECOM **Service Request:** K1804531

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Sample Matrix: Sediment

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Extraction Method: EPA 3541

Sample Name	Lab Code	S_Endrin-13C12 20-157	S_GBHCD6 5-124	S_Heptachlor-13C10 10-177
Batch QC	K1804532-009	54	45	58

Client: AECOM **Service Request:** K1804531

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Sample Matrix: Sediment

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Extraction Method: EPA 3541

Sample Name	Lab Code	S_Heptachlrepox13C10 8-146	S_Oxychlordane-13C10 5-144
Batch QC	K1804532-009	49	58

Client: AECOM **Service Request:**K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:**06/24/18 14:56

Internal Standard Area and RT SUMMARY
Organochlorine Pesticides by GC/MS/MS

File ID: J:\MS21\Data\062418\062418F015.D\ **Lab Code:**KQ1808515-01
Instrument ID: K-MSMS-01 **Analysis Lot:**596045
Analysis Method: ALS SOP **Signal ID:**1

	Pyrene-d10	
	Area	**RT**
ICAL Result ==>	9,935	14.5042
Upper Limit ==>	19,871	15.00
Lower Limit ==>	4,968	14.00

Associated Analyses

Continuing Calibration Verification	KQ1808515-01	18301.5	14.53
Method Blank	KQ1806350-04	16045	14.53
Lab Control Sample	KQ1806350-03	17290.5	14.5299
Batch QCMS	KQ1806350-01	24063.8	14.5299
Batch QCDMS	KQ1806350-02	24358.8	14.53
PDI-SG-B077-BL1	K1804531-001	23831.4	14.53
PDI-SG-B380-BL1	K1804531-002	32930.5	14.5555

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 06/25/18 12:51

Internal Standard Area and RT SUMMARY
Organochlorine Pesticides by GC/MS/MS

File ID: J:\MS21\Data\062518\062518F011.D\ **Lab Code:** KQ1808567-01
Instrument ID: K-MSMS-01 **Analysis Lot:** 596198
Analysis Method: ALS SOP **Signal ID:** 1

	Pyrene-d10	
	Area	**RT**
ICAL Result ==>	34,126	14.53
Upper Limit ==>	68,253	15.03
Lower Limit ==>	17,063	14.03

Associated Analyses

Continuing Calibration Verification	KQ1808567-01	34126.3	14.53
Batch QC	K1804532-009	33570.4	14.5043

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	N/A
Sample Matrix:	Sediment	**Date Received:**	N/A
		Date Analyzed:	06/24/18
		Date Extracted:	05/18/18

Duplicate Matrix Spike Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name:	Batch QC	**Units:**	ug/Kg
Lab Code:	K1804532-009	**Basis:**	Dry
Analysis Method:	ALS SOP		
Prep Method:	EPA 3541		

		Matrix Spike KQ1806350-01			**Duplicate Matrix Spike** KQ1806350-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
2,4'-DDD	ND U	2.43	1.88	129	2.42	1.87	129	32-169	<1	40
2,4'-DDE	ND U	2.41	1.88	128	2.41	1.87	129	43-155	<1	40
2,4'-DDT	ND U	2.62	1.88	140	3.14	1.87	168 *	55-161	18	40
4,4'-DDD	0.80 J	2.49	1.88	90	2.50	1.87	91	10-190	<1	40
4,4'-DDE	2.0	4.22	1.88	117	4.34	1.87	124	35-162	3	40
4,4'-DDT	ND U	2.08	1.88	111	2.28	1.87	122	24-183	9	40
Aldrin	ND U	1.76	1.88	94	1.29	1.87	69	52-151	31	40
alpha-Chlordane	ND U	2.35	1.88	125	3.20	1.87	171 *	31-156	31	40
cis-Nonachlor	ND U	2.95	1.88	157 *	4.48	1.87	239 *	27-144	41*	40
Dieldrin	ND U	1.45	1.88	77	1.64	1.87	88	28-150	12	40
gamma-BHC (Lindane)	ND U	2.34	1.88	125	2.22	1.87	119	64-135	5	40
gamma-Chlordane	ND U	1.77	1.88	94	2.69	1.87	144	31-158	41*	40
Heptachlor	ND U	1.14	1.88	61 *	1.00	1.87	54 *	76-117	13	40
trans-Nonachlor	ND U	1.92	1.88	102	3.62	1.87	193 *	35-153	61*	40

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.

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Analyzed:**	06/24/18
Sample Matrix:	Sediment	**Date Extracted:**	05/18/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Analysis Method:	ALS SOP	**Units:**	ug/Kg
Prep Method:	EPA 3541	**Basis:**	Dry
		Analysis Lot:	596045

Lab Control Sample
KQ1806350-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4'-DDD	2.00	2.00	100	73-122
2,4'-DDE	1.93	2.00	97	54-145
2,4'-DDT	2.13	2.00	107	77-118
4,4'-DDD	1.77	2.00	89	74-117
4,4'-DDE	1.84	2.00	92	66-132
4,4'-DDT	1.74	2.00	87	78-116
Aldrin	1.69	2.00	85	74-122
alpha-Chlordane	2.31	2.00	115	74-130
cis-Nonachlor	2.80	2.00	140 *	69-134
Dieldrin	1.31	2.00	65	62-131
gamma-BHC (Lindane)	2.14	2.00	107	79-116
gamma-Chlordane	1.77	2.00	89	76-128
Heptachlor	1.13	2.00	57 *	81-114
trans-Nonachlor	2.26	2.00	113	76-124

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Analyzed:**	06/24/18 15:25
Sample Matrix:	Sediment	**Date Extracted:**	05/18/18

Method Blank Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name:	Method Blank	**Instrument ID:**	K-MSMS-01
Lab Code:	KQ1806350-04	**File ID:**	J:\MS21\Data\062418\062418F016.D\
Analysis Method:	ALS SOP	**Analysis Lot:**	596045,596198
Prep Method:	EPA 3541	**Extraction Lot:**	313886

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1806350-03	J:\MS21\Data\062418\062418F017.D\	06/24/18 15:51
Batch QCMS	KQ1806350-01	J:\MS21\Data\062418\062418F018.D\	06/24/18 16:18
Batch QCDMS	KQ1806350-02	J:\MS21\Data\062418\062418F019.D\	06/24/18 16:45
PDI-SG-B077-BL1	K1804531-001	J:\MS21\Data\062418\062418F020.D\	06/24/18 17:13
PDI-SG-B380-BL1	K1804531-002	J:\MS21\Data\062418\062418F021.D\	06/24/18 17:40
Batch QC	K1804532-009	J:\MS21\Data\062518\062518F023.D\	06/25/18 17:53

Client:	AECOM	**Service Request:**	K1804531
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Analyzed:**	06/24/18 15:51
Sample Matrix:	Sediment	**Date Extracted:**	05/18/18

Lab Control Sample Summary
Organochlorine Pesticides by GC/MS/MS

Sample Name:	Lab Control Sample	**Instrument ID:**	K-MSMS-01
Lab Code:	KQ1806350-03	**File ID:**	J:\MS21\Data\062418\062418F017.D\
Analysis Method:	ALS SOP	**Analysis Lot:**	596045,596198
Prep Method:	EPA 3541	**Extraction Lot:**	313886

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1806350-04	J:\MS21\Data\062418\062418F016.D\	06/24/18 15:25
Batch QCMS	KQ1806350-01	J:\MS21\Data\062418\062418F018.D\	06/24/18 16:18
Batch QCDMS	KQ1806350-02	J:\MS21\Data\062418\062418F019.D\	06/24/18 16:45
PDI-SG-B077-BL1	K1804531-001	J:\MS21\Data\062418\062418F020.D\	06/24/18 17:13
PDI-SG-B380-BL1	K1804531-002	J:\MS21\Data\062418\062418F021.D\	06/24/18 17:40
Batch QC	K1804532-009	J:\MS21\Data\062518\062518F023.D\	06/25/18 17:53

Client: AECOM **Service Request:**K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:**06/24/18 14:56

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: J:\MS21\Data\062418\062418F015.D\ **Analytical Method:** ALS SOP
Instrument ID: K-MSMS-01 **Analysis Lot:** 596045

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1808515-01	J:\MS21\Data\062418\062418F015.D\	06/24/18 14:56	
Method Blank	KQ1806350-04	J:\MS21\Data\062418\062418F016.D\	06/24/18 15:25	
Lab Control Sample	KQ1806350-03	J:\MS21\Data\062418\062418F017.D\	06/24/18 15:51	
Batch QC	KQ1806350-01	J:\MS21\Data\062418\062418F018.D\	06/24/18 16:18	
Batch QC	KQ1806350-02	J:\MS21\Data\062418\062418F019.D\	06/24/18 16:45	
PDI-SG-B077-BL1	K1804531-001	J:\MS21\Data\062418\062418F020.D\	06/24/18 17:13	
PDI-SG-B380-BL1	K1804531-002	J:\MS21\Data\062418\062418F021.D\	06/24/18 17:40	

Client: AECOM **Service Request:**K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:**06/25/18 12:51

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: J:\MS21\Data\062518\062518F011.D\ **Analytical Method:** ALS SOP
Instrument ID: K-MSMS-01 **Analysis Lot:** 596198

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1808567-01	J:\MS21\Data\062518\062518F011.D\	06/25/18 12:51	
Batch QC	K1804532-009	J:\MS21\Data\062518\062518F023.D\	06/25/18 17:53	

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/22/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800289 **Signal ID:** 1
Instrument ID: K-MSMS-01

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800289-01		J:\MS21\Data\062218\062218F010a.D	06/22/2018 23:29
02	KC1800289-02		J:\MS21\Data\062218\062218F011a.D	06/23/2018 00:00
03	KC1800289-03		J:\MS21\Data\062218\062218F012a.D	06/23/2018 00:30
04	KC1800289-04		J:\MS21\Data\062218\062218F013a.D	06/23/2018 01:01
05	KC1800289-05		J:\MS21\Data\062218\062218F014a.D	06/23/2018 01:32
06	KC1800289-06		J:\MS21\Data\062218\062218F015a.D	06/23/2018 02:03
07	KC1800289-07		J:\MS21\Data\062218\062218F016a.D	06/23/2018 02:34
08	KC1800289-08		J:\MS21\Data\062218\062218F017a.D	06/23/2018 03:05
09	KC1800289-09		J:\MS21\Data\062218\062218F018a.D	06/23/2018 03:37
10	KC1800289-10		J:\MS21\Data\062218\062218F019a.D	06/23/2018 04:09

Analyte

2,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.4721	02	1.0	0.4508	03	2.0	0.3846	04	5.0	0.3893
05	10	0.3914	06	20	0.4054	07	40	0.3823	08	60	0.3838
09	80	0.4029	10	100	0.382						

2,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.3623	02	1.0	0.2681	03	2.0	0.2612	04	5.0	0.2856
05	10	0.2684	06	20	0.2743	07	40	0.2516	08	60	0.2796
09	80	0.2955	10	100	0.2636						

2,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.4741	02	1.0	0.4121	03	2.0	0.4966	04	5.0	0.4631
05	10	0.4429	06	20	0.4689	07	40	0.4282	08	60	0.4486
09	80	0.4483	10	100	0.4613						

4,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.8668	02	1.0	0.7121	03	2.0	0.6938	04	5.0	0.6301
05	10	0.6183	06	20	0.6351	07	40	0.608	08	60	0.6204
09	80	0.641	10	100	0.6396						

4,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.2923	02	1.0	0.2827	03	2.0	0.2293	04	5.0	0.2402
05	10	0.2434	06	20	0.2357	07	40	0.2359	08	60	0.2339
09	80	0.2472	10	100	0.2422						

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.8167	02	1.0	0.7254	03	2.0	0.6836	04	5.0	0.6742
05	10	0.6381	06	20	0.6653	07	40	0.6244	08	60	0.6384

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/22/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800289 **Signal ID:** 1
Instrument ID: K-MSMS-01

Analyte

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
09	80	0.6525	10	100	0.6675						

Aldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	1.0	1.377	03	2.0	1.188	04	5.0	0.8944	05	10	1.045
06	20	0.7645	07	40	0.9203	08	60	0.8708	09	80	0.9316
10	100	0.8808									

Dieldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.842	02	1.0	1.413	03	2.0	1.134	04	5.0	1.106
05	10	1.384	06	20	1.343	07	40	1.291	08	60	1.148
09	80	1.329	10	100	1.083						

Heptachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.088	02	1.0	1.016	03	2.0	1.223	04	5.0	1.024
05	10	1.08	06	20	0.9896	07	40	0.9884	08	60	0.9314
09	80	0.9385	10	100	0.9583						

alpha-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.164	02	1.0	3.488	03	2.0	3.812	04	5.0	3.09
05	10	3.217	06	20	2.752	07	40	3.212	08	60	3.419
09	80	3.735	10	100	3.179						

cis-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.345	02	1.0	2.898	03	2.0	3.257	04	5.0	3.246
05	10	3.233	06	20	2.792	07	40	2.952	08	60	3.343
09	80	3.903	10	100	2.896						

gamma-BHC (Lindane)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.6638	02	1.0	0.7516	03	2.0	0.6099	04	5.0	0.5202
05	10	0.5334	06	20	0.478	07	40	0.5163	08	60	0.518
09	80	0.5418	10	100	0.5185						

gamma-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	5.645	02	1.0	3.608	03	2.0	4.941	04	5.0	4.436
05	10	3.636	06	20	3.142	07	40	3.638	08	60	4.161
09	80	4.265	10	100	3.819						

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	3.582	02	1.0	1.971	03	2.0	2.88	04	5.0	2.359

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/22/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800289 **Signal ID:** 1
Instrument ID: K-MSMS-01

Analyte

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
05	10	2.187	06	20	2.014	07	40	2.161	08	60	2.396
09	80	2.61	10	100	2.261						

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/22/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800289 **Signal ID:** 1
Instrument ID: K-MSMS-01

		Calibration Evaluation				Calibration Evaluation	
Analyte Name	Compound Type	Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
2,4'-DDD	TRG	Average RF	% RSD	7.8	≤20	0.4045	0.01
2,4'-DDE	TRG	Average RF	% RSD	11.1	≤20	0.281	0.01
2,4'-DDT	TRG	Average RF	% RSD	5.3	≤20	0.4544	0.01
4,4'-DDD	TRG	Average RF	% RSD	11.7	≤20	0.6665	0.01
4,4'-DDE	TRG	Average RF	% RSD	8.6	≤20	0.2483	0.01
4,4'-DDT	TRG	Average RF	% RSD	8.3	≤20	0.6786	0.01
Aldrin	TRG	Average RF	% RSD	19.2	≤20	0.9859	0.01
Dieldrin	TRG	Average RF	% RSD	17.1	≤20	1.307	0.01
Heptachlor	TRG	Average RF	% RSD	8.6	≤20	1.024	0.01
alpha-Chlordane	TRG	Average RF	% RSD	12.0	≤20	3.407	0.01
cis-Nonachlor	TRG	Average RF	% RSD	14.9	≤20	3.286	0.01
gamma-BHC (Lindane)	TRG	Quadratic	COD	0.9987	≥	0.5651	0.01
gamma-Chlordane	TRG	Average RF	% RSD	17.9	≤20	4.129	0.01
trans-Nonachlor	TRG	Average RF	% RSD	19.8	≤20	2.442	0.01

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/25/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800340 **Signal ID:** 1
Instrument ID: K-MSMS-01

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800340-01		J:\MS21\Data\062518\062518F006.D	06/25/2018 10:38
02	KC1800340-02		J:\MS21\Data\062518\062518F007.D	06/25/2018 11:02
03	KC1800340-03		J:\MS21\Data\062518\062518F008.D	06/25/2018 11:29
04	KC1800340-04		J:\MS21\Data\062518\062518F009.D	06/25/2018 11:56
05	KC1800340-05		J:\MS21\Data\062518\062518F010.D	06/25/2018 12:23
06	KC1800340-06		J:\MS21\Data\062518\062518F011.D	06/25/2018 12:51
07	KC1800340-07		J:\MS21\Data\062518\062518F012.D	06/25/2018 13:18
08	KC1800340-08		J:\MS21\Data\062518\062518F013.D	06/25/2018 13:45
09	KC1800340-09		J:\MS21\Data\062518\062518F014.D	06/25/2018 14:13
10	KC1800340-10		J:\MS21\Data\062518\062518F015.D	06/25/2018 14:40

Analyte

2,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.5642	02	1.0	0.5158	03	2.0	0.49	04	5.0	0.4456
05	10	0.4593	06	20	0.4455	07	40	0.4367	08	60	0.4305
09	80	0.4389	10	100	0.4412						

2,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.2674	02	1.0	0.2704	03	2.0	0.2518	04	5.0	0.2543
05	10	0.2781	06	20	0.2632	07	40	0.2614	08	60	0.2829
09	80	0.2951	10	100	0.2694						

2,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.609	02	1.0	0.5675	03	2.0	0.5218	04	5.0	0.5373
05	10	0.5301	06	20	0.5247	07	40	0.5289	08	60	0.5005
09	80	0.4887	10	100	0.5458						

4,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.7791	02	1.0	0.6892	03	2.0	0.6471	04	5.0	0.6062
05	10	0.6081	06	20	0.6041	07	40	0.5955	08	60	0.6079
09	80	0.6326	10	100	0.6035						

4,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.3513	02	1.0	0.3223	03	2.0	0.2837	04	5.0	0.2617
05	10	0.2707	06	20	0.2669	07	40	0.2719	08	60	0.2609
09	80	0.2647	10	100	0.2761						

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.702	02	1.0	0.6871	03	2.0	0.6739	04	5.0	0.6383
05	10	0.6297	06	20	0.6224	07	40	0.618	08	60	0.6326

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/25/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800340 **Signal ID:** 1
Instrument ID: K-MSMS-01

Analyte

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
09	80	0.6232	10	100	0.6308						

Aldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.38	02	1.0	0.8109	03	2.0	1.002	04	5.0	0.9288
05	10	0.9635	06	20	0.8975	07	40	0.8093	08	60	0.8686
09	80	0.8848	10	100	0.8507						

Dieldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.364	02	1.0	0.9886	03	2.0	0.9702	04	5.0	1.053
05	10	0.878	06	20	0.9678	07	40	0.9882	08	60	1.024
09	80	1.05	10	100	1.058						

Heptachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.573	02	1.0	1.011	03	2.0	1.095	04	5.0	0.9404
05	10	1.005	06	20	1.013	07	40	0.9114	08	60	0.998
09	80	0.9581	10	100	0.9369						

S_4,4'-DDT-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	4.944	02	5	4.785	03	5	4.993	04	5	4.776
05	5	4.709	06	5	4.93	07	5	4.879	08	5	5.179
09	5	5.212	10	5	4.823						

S_4,4'DDD-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	8.481	02	5	8.005	03	5	8.624	04	5	8.698
05	5	8.328	06	5	8.531	07	5	8.421	08	5	8.839
09	5	8.641	10	5	8.336						

S_Aldrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1665	02	20	0.2104	03	20	0.2254	04	20	0.2138
05	20	0.2304	06	20	0.2157	07	20	0.2558	08	20	0.2248
09	20	0.2238	10	20	0.242						

S_Endrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1384	02	20	0.1359	03	20	0.1564	04	20	0.131
05	20	0.1504	06	20	0.1447	07	20	0.1427	08	20	0.1323
09	20	0.1355	10	20	0.139						

S_GBHCD6

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.5117	02	20	0.6727	03	20	0.7029	04	20	0.6818

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/25/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800340 **Signal ID:** 1
Instrument ID: K-MSMS-01

Analyte

S_GBHCD6

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
05	20	0.6858	06	20	0.6882	07	20	0.7345	08	20	0.7197
09	20	0.7071	10	20	0.726						

S_Heptachlor-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.2479	02	20	0.4169	03	20	0.4613	04	20	0.4664
05	20	0.4975	06	20	0.4848	07	20	0.5638	08	20	0.4112
09	20	0.5122	10	20	0.5566						

S_Heptachlrepox13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1591	02	20	0.1866	03	20	0.1784	04	20	0.2001
05	20	0.2125	06	20	0.195	07	20	0.2113	08	20	0.1916
09	20	0.203	10	20	0.2209						

S_Oxychlordane-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1062	02	20	0.1091	03	20	0.1178	04	20	0.1073
05	20	0.1202	06	20	0.1064	07	20	0.1152	08	20	0.1106
09	20	0.1003	10	20	0.1089						

alpha-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	3.543	02	1.0	2.746	03	2.0	3.393	04	5.0	2.64
05	10	2.871	06	20	2.911	07	40	2.781	08	60	2.94
09	80	3.253	10	100	3.074						

cis-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	3.471	02	1.0	2.881	03	2.0	2.553	04	5.0	3.152
05	10	2.682	06	20	2.967	07	40	2.594	08	60	2.961
09	80	3.232	10	100	2.832						

gamma-BHC (Lindane)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.8006	02	1.0	0.6322	03	2.0	0.573	04	5.0	0.5024
05	10	0.5182	06	20	0.5228	07	40	0.4895	08	60	0.4886
09	80	0.52	10	100	0.5016						

gamma-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	5.5	02	1.0	4.346	03	2.0	3.167	04	5.0	3.445
05	10	3.394	06	20	3.539	07	40	3.344	08	60	3.587
09	80	3.893	10	100	3.764						

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/25/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800340 **Signal ID:** 1
Instrument ID: K-MSMS-01

Analyte

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.385	02	1.0	2.759	03	2.0	1.893	04	5.0	2.132
05	10	1.967	06	20	2.243	07	40	1.914	08	60	2.13
09	80	2.421	10	100	2.302						

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/25/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800340 **Signal ID:** 1
Instrument ID: K-MSMS-01

		Calibration Evaluation				Calibration Evaluation	
Analyte Name	Compound Type	Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
2,4'-DDD	TRG	Average RF	% RSD	9.3	≤20	0.4668	0.01
2,4'-DDE	TRG	Average RF	% RSD	4.9	≤20	0.2694	0.01
2,4'-DDT	TRG	Average RF	% RSD	6.3	≤20	0.5354	0.01
4,4'-DDD	TRG	Average RF	% RSD	9.0	≤20	0.6373	0.01
4,4'-DDE	TRG	Average RF	% RSD	10.6	≤20	0.283	0.01
4,4'-DDT	TRG	Average RF	% RSD	4.7	≤20	0.6458	0.01
Aldrin	TRG	Average RF	% RSD	17.7	≤20	0.9396	0.01
Dieldrin	TRG	Average RF	% RSD	12.4	≤20	1.034	0.01
Heptachlor	TRG	Quadratic	COD	0.9987	≥	1.044	0.01
S_4,4'-DDT-d4	SURR	Average RF	% RSD	3.4	≤	4.923	0.01
S_4,4'DDD-d4	SURR	Average RF	% RSD	2.8	≤	8.49	0.01
S_Aldrin-13C12	SURR	Average RF	% RSD	10.6	≤	0.2209	0.01
S_Endrin-13C12	SURR	Average RF	% RSD	5.7	≤	0.1406	0.01
S_GBHCD6	SURR	Average RF	% RSD	9.3	≤	0.6831	0.01
S_Heptachlor-13C10	SURR	Average RF	% RSD	19.6	≤	0.4619	0.01
S_Heptachlrepox13C10	SURR	Average RF	% RSD	9.3	≤	0.1958	0.01
S_Oxychlordane-13C10	SURR	Average RF	% RSD	5.4	≤	0.1102	0.01
alpha-Chlordane	TRG	Average RF	% RSD	9.8	≤20	3.015	0.01
cis-Nonachlor	TRG	Average RF	% RSD	9.9	≤20	2.932	0.01
gamma-BHC (Lindane)	TRG	Average RF	% RSD	17.5	≤20	0.5549	0.01
gamma-Chlordane	TRG	Average RF	% RSD	18.0	≤20	3.798	0.01
trans-Nonachlor	TRG	Average RF	% RSD	12.1	≤20	2.215	0.01

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/22/2018

Initial Calibration Verification Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800289 **Signal ID:** 1
Instrument ID: K-MSMS-01

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800289-11		J:\MS21\Data\062218\062218F020a.D	06/23/2018 04:41
12	KC1800289-12		J:\MS21\Data\062218\062218F020a.D	06/23/2018 04:41

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4'-DDD	20.0	18.6	4.045E-1	3.771E-1	-6.776	±25	Average RF
2,4'-DDE	20.0	18.3	2.81E-1	2.566E-1	-8.662	±25	Average RF
2,4'-DDT	20.0	17.4	4.544E-1	3.945E-1	-13.189	±25	Average RF
4,4'-DDD	20.0	18.6	6.665E-1	6.191E-1	-7.108	±25	Average RF
4,4'-DDE	20.0	20.3	2.483E-1	2.519E-1	1.47	±25	Average RF
4,4'-DDT	20.0	18.6	6.786E-1	6.325E-1	-6.792	±25	Average RF
Aldrin	20.0	18.6	9.859E-1	9.183E-1	-6.852	±25	Average RF
alpha-Chlordane	20.0	18.3	3.407E0	3.115E0	-8.554	±25	Average RF
cis-Nonachlor	20.0	16.0	3.286E0	2.622E0	-20.207	±25	Average RF
Dieldrin	20.0	19.6	1.307E0	1.283E0	-1.873	±25	Average RF
gamma-BHC (Lindane)	20.0	19.5	5.651E-1	4.989E-1	-2.591	±25	Quadratic
gamma-Chlordane	20.0	16.8	4.129E0	3.476E0	-15.819	±25	Average RF
Heptachlor	20.0	20.3	1.024E0	1.039E0	1.45	±25	Average RF
trans-Nonachlor	20.0	16.4	2.442E0	2.001E0	-18.061	±25	Average RF

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 6/25/2018

Initial Calibration Verification Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800340 **Signal ID:** 1
Instrument ID: K-MSMS-01

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800340-11		J:\MS21\Data\062518\062518F016.D	06/25/2018 15:07

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4'-DDD	20.0	18.2	4.668E-1	4.256E-1	-8.829	±25	Average RF
2,4'-DDE	20.0	21.2	2.694E-1	2.856E-1	6.02	±25	Average RF
2,4'-DDT	20.0	18.7	5.354E-1	4.995E-1	-6.705	±25	Average RF
4,4'-DDD	20.0	18.7	6.373E-1	5.968E-1	-6.369	±25	Average RF
4,4'-DDE	20.0	19.7	2.83E-1	2.783E-1	-1.660	±25	Average RF
4,4'-DDT	20.0	19.9	6.458E-1	6.414E-1	-0.688	±25	Average RF
Aldrin	20.0	19.2	9.396E-1	9.028E-1	-3.923	±25	Average RF
alpha-Chlordane	20.0	18.1	3.015E0	2.725E0	-9.611	±25	Average RF
cis-Nonachlor	20.0	15.5	2.932E0	2.276E0	-22.372	±25	Average RF
Dieldrin	20.0	17.7	1.034E0	9.16E-1	-11.436	±25	Average RF
gamma-BHC (Lindane)	20.0	18.5	5.549E-1	5.141E-1	-7.361	±25	Average RF
gamma-Chlordane	20.0	17.7	3.798E0	3.357E0	-11.604	±25	Average RF
Heptachlor	20.0	20.9	1.044E0	1.022E0	4.57	±25	Quadratic
trans-Nonachlor	20.0	18.0	2.215E0	1.998E0	-9.761	±25	Average RF

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.02	8.49E0	8.531E0	100	50-200	Average RF
S_4,4'-DDT-d4	5.00	4.77	4.923E0	4.7E0	95.4	50-200	Average RF
S_Aldrin-13C12	20.0	25.0	2.209E-1	2.755E-1	125	50-200	Average RF
S_Endrin-13C12	20.0	22.0	1.406E-1	1.55E-1	110	50-200	Average RF
S_GBHCD6	20.0	22.6	6.831E-1	7.723E-1	113	50-200	Average RF
S_Heptachlor-13C10	20.0	23.7	4.619E-1	5.477E-1	119	50-200	Average RF
S_Heptachlrepox13C10	20.0	22.3	1.958E-1	2.187E-1	112	50-200	Average RF
S_Oxychlordane-13C10	20.0	23.4	1.102E-1	1.29E-1	117	50-200	Average RF

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 06/24/18 14:56

Continuing Calibration Verification (CCV) Summary
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP **Calibration Date:** 6/22/2018
File ID: J:\MS21\Data\062418\062418F015.D\ **Calibration ID:** KC1800289
Signal ID: 1 **Analysis Lot:** 596045
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	19.9	0.4045	0.4032	-0.3	NA	±25	Average RF
2,4'-DDE	20.0	17.1	0.281	0.2406	-14.4	NA	±25	Average RF
2,4'-DDT	20.0	20.9	0.4544	0.4741	4.3	NA	±25	Average RF
4,4'-DDD	20.0	16.5	0.6665	0.5491	-17.6	NA	±25	Average RF
4,4'-DDE	20.0	19.5	0.2483	0.2419	-2.6	NA	±25	Average RF
4,4'-DDT	20.0	16.9	0.6786	0.5747	-15.3	NA	±25	Average RF
Aldrin	20.0	15.3	0.9859	0.7546	-23.5	NA	±25	Average RF
alpha-Chlordane	20.0	17.1	3.4067	2.9203	-14.3	NA	±25	Average RF
cis-Nonachlor	20.0	20.8	3.2864	3.4222	4.1	NA	±25	Average RF
Dieldrin	20.0	16.7	1.3073	1.0884	-16.7	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	19.4	0.5651	0.4973	NA	-2.9	±25	Quadratic
gamma-Chlordane	20.0	16.2	4.1291	3.3457	-19.0	NA	±25	Average RF
Heptachlor	20.0	10.8	1.0237	0.5523	-46.1*	NA	±25	Average RF
trans-Nonachlor	20.0	18.5	2.4421	2.2533	-7.7	NA	±25	Average RF

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 06/25/18 12:51

Continuing Calibration Verification (CCV) Summary
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP **Calibration Date:** 6/25/2018
File ID: J:\MS21\Data\062518\062518F011.D\ **Calibration ID:** KC1800340
Signal ID: 1 **Analysis Lot:** 596198
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	19.1	0.4668	0.4455	-4.6	NA	±25	Average RF
2,4'-DDE	20.0	19.5	0.2694	0.2632	-2.3	NA	±25	Average RF
2,4'-DDT	20.0	19.6	0.5354	0.5247	-2.0	NA	±25	Average RF
4,4'-DDD	20.0	19.0	0.6373	0.6041	-5.2	NA	±25	Average RF
4,4'-DDE	20.0	18.9	0.283	0.2669	-5.7	NA	±25	Average RF
4,4'-DDT	20.0	19.3	0.6458	0.6224	-3.6	NA	±25	Average RF
Aldrin	20.0	19.1	0.9396	0.8975	-4.5	NA	±25	Average RF
alpha-Chlordane	20.0	19.3	3.0152	2.9109	-3.5	NA	±25	Average RF
cis-Nonachlor	20.0	20.2	2.9324	2.9668	1.2	NA	±25	Average RF
Dieldrin	20.0	18.7	1.0342	0.9678	-6.4	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	18.8	0.5549	0.5228	-5.8	NA	±25	Average RF
gamma-Chlordane	20.0	18.6	3.798	3.5388	-6.8	NA	±25	Average RF
Heptachlor	20.0	20.7	1.0443	1.0132	NA	3.7	±25	Quadratic
trans-Nonachlor	20.0	20.3	2.2146	2.2425	1.3	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.02	8.4903	8.5306	100	NA	50-200	Average RF
S_4,4'-DDT-d4	5.00	5.01	4.9232	4.9297	100	NA	50-200	Average RF
S_Aldrin-13C12	20.0	19.5	0.2209	0.2157	97.7	NA	50-200	Average RF
S_Endrin-13C12	20.0	20.6	0.1406	0.1447	103	NA	50-200	Average RF
S_GBHCD6	20.0	20.2	0.6831	0.6882	101	NA	50-200	Average RF
S_Heptachlor-13C10	20.0	21.0	0.4619	0.4848	105	NA	50-200	Average RF
S_Heptachlrepox13C10	20.0	19.9	0.1958	0.195	99.6	NA	50-200	Average RF
S_Oxychlordane-13C10	20.0	19.3	0.1102	0.1064	96.5	NA	50-200	Average RF

Client: AECOM **Service Request:**K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP **Analysis Lot:**596045
Instrument ID:K-MSMS-01

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\MS21\Data\062418\062418F015.D\	Continuing Calibration Verification	KQ1808515-01	6/24/2018	14:56:39	
J:\MS21\Data\062418\062418F016.D\	Method Blank	KQ1806350-04	6/24/2018	15:25:41	
J:\MS21\Data\062418\062418F017.D\	Lab Control Sample	KQ1806350-03	6/24/2018	15:51:19	
J:\MS21\Data\062418\062418F018.D\	Batch QC MS	KQ1806350-01	6/24/2018	16:18:35	
J:\MS21\Data\062418\062418F019.D\	Batch QC DMS	KQ1806350-02	6/24/2018	16:45:47	
J:\MS21\Data\062418\062418F020.D\	PDI-SG-B077-BL1	K1804531-001	6/24/2018	17:13:24	
J:\MS21\Data\062418\062418F021.D\	PDI-SG-B380-BL1	K1804531-002	6/24/2018	17:40:40	
J:\MS21\Data\062418\062418F022.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	18:07:56	
J:\MS21\Data\062418\062418F023.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	18:35:14	
J:\MS21\Data\062418\062418F024.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	19:02:31	
J:\MS21\Data\062418\062418F025.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	19:29:45	
J:\MS21\Data\062418\062418F026.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	19:57:02	
J:\MS21\Data\062418\062418F027.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	20:24:18	
J:\MS21\Data\062418\062418F028.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	20:51:34	
J:\MS21\Data\062418\062418F032.D\	ZZZZZZZ	ZZZZZZZ	6/24/2018	22:41:44	

Client: AECOM **Service Request:**K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP **Analysis Lot:**596198
Instrument ID:K-MSMS-01

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\MS21\Data\062518\062518F011.D\	Continuing Calibration Verification	KQ1808567-01	6/25/2018	12:51:14	
J:\MS21\Data\062518\062518F023.D\	Batch QC	K1804532-009	6/25/2018	17:53:18	
J:\MS21\Data\062518\062518F024.D\	ZZZZZZZ	ZZZZZZZ	6/25/2018	18:20:34	
J:\MS21\Data\062518\062518F025.D\	ZZZZZZZ	ZZZZZZZ	6/25/2018	18:48:14	
J:\MS21\Data\062518\062518F026.D\	ZZZZZZZ	ZZZZZZZ	6/25/2018	19:15:36	
J:\MS21\Data\062518\062518F027.D\	ZZZZZZZ	ZZZZZZZ	6/25/2018	19:42:53	
J:\MS21\Data\062518\062518F028.D\	ZZZZZZZ	ZZZZZZZ	6/25/2018	20:10:08	
J:\MS21\Data\062518\062518F029.D\	ZZZZZZZ	ZZZZZZZ	6/25/2018	20:37:42	

Client: AECOM **Service Request:** K1804531
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Organochlorine Pesticides by GC/MS/MS

Prep Method: EPA 3541 **Extraction Lot:** 313886
Analytical Method: ALS SOP **Extraction Date:** 05/18/18 10:00

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
PDI-SG-B077-BL1	K1804531-001	5/11/18	5/14/18	20.120 g	1 mL	37.9
PDI-SG-B380-BL1	K1804531-002	5/13/18	5/14/18	20.047 g	1 mL	54.8
Batch QC	K1804532-009	NA	NA	20.168 g	1 mL	53.1
Matrix Spike	KQ1806350-01MS	NA	NA	20.061 g	1 mL	53.1
Duplicate Matrix Spike	KQ1806350-02DMS	NA	NA	20.108 g	1 mL	53.1
Lab Control Sample	KQ1806350-03LCS	NA	NA	10 g	1 mL	
Method Blank	KQ1806350-04MB	NA	NA	20.4280 g	1 mL	