



ALS Environmental
ALS Group USA, Corp
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www.alsglobal.com

July 26, 2018

Analytical Report for Service Request No: K1804480B

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 11, 2018
For your reference, these analyses have been assigned our service request number **K1804480**.

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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Table of Contents

Acronyms

Qualifiers

State Certifications, Accreditations, And Licenses

Case Narrative

Chain of Custody

Total Solids

Organochlorine Pesticides

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/bsdwlabservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

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

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



Case Narrative

ALS Environmental—Kelso Laboratory
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Phone (360)577-7222 Fax (360)636-1068
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Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation
Sample Matrix: Sediment

Service Request: K1804480
Date Received: 05/11/2018

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:

One sediment sample was received for analysis at ALS Environmental on 05/11/2018. The sample was 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:

Method 8270D, 06/14/2018: The matrix spike recovery of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene and Benzo(a)pyrene for sample PDI-SG-B078-BL1 was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential high bias in this matrix. No further corrective action was appropriate.

Method 8270D, 06/14/2018: The recovery of Phenanthrene in the Duplicate Matrix Spike (DMS) KWG1802611-2 was outside the recovery control limits listed in the results summary. The DMS is used to evaluate batch precision. The relative percent difference (RPD) was within control limits indicating the quality of the sample data was not significantly affected. No further corrective action was taken.

Method 8270D, 06/14/2018: The Relative Percent Difference (RPD) for Fluoranthene, Pyrene and Benz(a)anthracene in the replicate matrix spike analyses of PDI-SG-B078-BL1 was outside control criteria. In general, the RPD was relatively high for all spiked compounds, which indicated a high bias in the Matrix Spike (MS). All spike recoveries in the 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 ALS SOP, 07/21/2018: The upper control criterion was exceeded for 2,4'-DDT (133, 77-118), 4,4'-DDT (123, 78-116), alpha-Chlordane (162, 74-130), cis-Nonachlor (191, 69-134), gamma-Chlordane (148, 76-128), and trans-Nonachlor (169, 76-125) in Laboratory Control Sample (LCS) KQ1809004-03. Alpha-Chlordane, cis-Nonachlor, gamma-Chlordane, and trans-Nonachlor were not detected in the associated field sample. The error associated with elevated recovery indicated a high bias. The sample data was not significantly affected. 2,4'-DDT and 4,4'-DDT were detected in the associated field sample. The error associated with elevated recovery indicated a high bias. The data has been flagged to indicate the exceedance.

Method ALS SOP, 05/21/2018: The Relative Percent Difference (RPD) for cis-Nonachlor in the replicate matrix spike analyses of sample Batch QC was outside control criteria. All spike recoveries for the compounds in question 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.

Semivolatile GC:

Method ALS SOP Butyltins, 06/18/2018: The upper control criterion was exceeded for the following analyte in Matrix Spike (MS) KQ1806578-01: Tri-n-butyltin Cation. The analyte in question was detected in the associated field sample. The error associated with elevated recovery indicated a high bias. The elevation was limited to the Matrix Spike and recovery in the Method Blank, Duplicate Matrix Spike and Laboratory Control Sample exhibited results within control criteria. The sample data was not significantly affected. No further corrective action was appropriate.

SMO:



Approved by _____

Date 07/26/2018

No significant anomalies were noted with this analysis.



Approved by _____

Date 07/26/2018



Chain of Custody

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[illegible]

PC HJ

Cooler Receipt and Preservation Form

Client AECOM Service Request K18 04480
Received: 5/11/18 Opened: 5/11/18 By: BR Unloaded: 5/11/18 By: BR

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? 1 front
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	File
<u>48</u>	<u>48</u>	<u>38</u>	<u>38</u>	<u>0.0</u>	<u>350</u>	<u>NA</u>		<u>NA</u>

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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dba ALS Environmental

Analytical Report

Client: AECOM

Project: Portland Harbor Pre-Remedial Design/60566335

Sample Matrix: Sediment

Analysis Method: 160.3 Modified

Prep Method: None

Service Request: K1804480

Date Collected: 05/9/18

Date Received: 05/11/18

Units: Percent

Basis: As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
PDI-SG-B078-BL1	K1804480-001	69.5	-	-	1	05/18/18 14:52	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

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

Service Request: K1804480**Date Collected:** 05/09/18**Date Received:** 05/11/18**Date Analyzed:** 05/18/18**Replicate Sample Summary****Inorganic Parameters****Sample Name:** PDI-SG-B078-BL1**Units:** Percent**Lab Code:** K1804480-001**Basis:** As Received

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1804480-001DUP	Average	RPD	RPD Limit
					Result			
Solids, Total	160.3 Modified	-	-	69.5	71.5	70.5	3	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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dba ALS Environmental

Analytical Report

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

Sample Name: PDI-SG-B078-BL1
Lab Code: K1804480-001

Service Request: K1804480
Date Collected: 05/09/18 10:15
Date Received: 05/11/18 13:20

Units: ug/Kg
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	1.5	0.28	0.18	1	07/21/18 00:55	7/6/18	
2,4'-DDE	ND U	0.28	0.23	1	07/21/18 00:55	7/6/18	
2,4'-DDT	1.5	0.28	0.27	1	07/21/18 00:55	7/6/18	*
4,4'-DDD	5.3	0.28	0.098	1	07/21/18 00:55	7/6/18	
4,4'-DDE	2.8	0.28	0.20	1	07/21/18 00:55	7/6/18	
4,4'-DDT	6.3	0.28	0.14	1	07/21/18 00:55	7/6/18	*
Aldrin	ND U	0.28	0.23	1	07/21/18 00:55	7/6/18	
alpha-Chlordane	ND U	0.56	0.18	1	07/21/18 00:55	7/6/18	*
cis-Nonachlor	ND U	0.28	0.28	1	07/21/18 00:55	7/6/18	*
Dieldrin	ND U	0.56	0.22	1	07/21/18 00:55	7/6/18	
gamma-BHC (Lindane)	ND U	0.28	0.087	1	07/21/18 00:55	7/6/18	
gamma-Chlordane	ND U	0.56	0.18	1	07/21/18 00:55	7/6/18	*
Heptachlor	ND U	0.28	0.11	1	07/21/18 00:55	7/6/18	
trans-Nonachlor	ND U	0.56	0.17	1	07/21/18 00:55	7/6/18	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	63	5 - 120	07/21/18 00:55	
S_4,4'-DDT-d4	64	13 - 200	07/21/18 00:55	
S_Aldrin-13C12	22	10 - 143	07/21/18 00:55	
S_Endrin-13C12	75	20 - 157	07/21/18 00:55	
S_GBHCDD6	23	5 - 124	07/21/18 00:55	
S_Heptachlor-13C10	27	10 - 177	07/21/18 00:55	
S_Heptachlrepox13C10	34	8 - 146	07/21/18 00:55	
S_Oxychlordane-13C10	41	5 - 144	07/21/18 00:55	

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dba ALS Environmental

Analytical Report

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

Sample Name: Method Blank
Lab Code: KQ1809004-04

Service Request: K1804480
Date Collected: NA
Date Received: NA

Units: ug/Kg
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	0.10	0.063	1	07/20/18 18:33	7/6/18	
2,4'-DDE	ND U	0.10	0.079	1	07/20/18 18:33	7/6/18	
2,4'-DDT	ND U	0.10	0.094	1	07/20/18 18:33	7/6/18	
4,4'-DDD	ND U	0.10	0.035	1	07/20/18 18:33	7/6/18	
4,4'-DDE	ND U	0.10	0.070	1	07/20/18 18:33	7/6/18	
4,4'-DDT	ND U	0.10	0.047	1	07/20/18 18:33	7/6/18	
Aldrin	ND U	0.10	0.079	1	07/20/18 18:33	7/6/18	
alpha-Chlordane	ND U	0.20	0.062	1	07/20/18 18:33	7/6/18	
cis-Nonachlor	ND U	0.10	0.097	1	07/20/18 18:33	7/6/18	
Dieldrin	ND U	0.20	0.077	1	07/20/18 18:33	7/6/18	
gamma-BHC (Lindane)	ND U	0.10	0.031	1	07/20/18 18:33	7/6/18	
gamma-Chlordane	ND U	0.20	0.064	1	07/20/18 18:33	7/6/18	
Heptachlor	ND U	0.10	0.039	1	07/20/18 18:33	7/6/18	
trans-Nonachlor	ND U	0.20	0.058	1	07/20/18 18:33	7/6/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	73	5 - 120	07/20/18 18:33	
S_4,4'-DDT-d4	68	13 - 200	07/20/18 18:33	
S_Aldrin-13C12	37	10 - 143	07/20/18 18:33	
S_Endrin-13C12	59	20 - 157	07/20/18 18:33	
S_GBHC6	34	5 - 124	07/20/18 18:33	
S_Heptachlor-13C10	41	10 - 177	07/20/18 18:33	
S_Heptachlrepox13C10	37	8 - 146	07/20/18 18:33	
S_Oxychlordane-13C10	48	5 - 144	07/20/18 18:33	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1804480

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	S_4,4'-DDT-d4	S_Aldrin-13C12
		5-120	13-200	10-143
Batch QC	K1803850-019	64	69	22
PDI-SG-B078-BL1	K1804480-001	63	64	22
Method Blank	KQ1809004-04	73	68	37
Lab Control Sample	KQ1809004-03	75	71	35
Batch QC	KQ1809004-01	77	78	29
Batch QC	KQ1809004-02	72	73	27

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dba ALS Environmental

QA/QC Report

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

Service Request: K1804480

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Endrin-13C12	S_GBHCD6	S_Heptachlor-13C10
		20-157	5-124	10-177
Batch QC	K1803850-019	79	18	26
PDI-SG-B078-BL1	K1804480-001	75	23	27
Method Blank	KQ1809004-04	59	34	41
Lab Control Sample	KQ1809004-03	68	39	47
Batch QC	KQ1809004-01	83	27	36
Batch QC	KQ1809004-02	71	28	35

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1804480

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Heptachlrepox13C10	S_Oxychlordane-13C10
		8-146	5-144
Batch QC	K1803850-019	34	35
PDI-SG-B078-BL1	K1804480-001	34	41
Method Blank	KQ1809004-04	37	48
Lab Control Sample	KQ1809004-03	47	32
Batch QC	KQ1809004-01	39	47
Batch QC	KQ1809004-02	40	42

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1804480
Date Analyzed: 07/20/18 18:06

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

File ID: J:\MS21\Data\072018\072018F021.D\
Instrument ID: K-MSMS-01
Analysis Method: ALS SOP

Lab Code: KQ1809858-01
Analysis Lot: 599464
Signal ID: 1

	Pyrene-d10	
	Area	RT
ICAL Result ==>	16,930	14.6139
Upper Limit ==>	33,860	15.11
Lower Limit ==>	8,465	14.11

Associated Analyses

Continuing Calibration Verification	KQ1809858-01	27411.6	14.6397
Method Blank	KQ1809004-04	18399.8	14.6139
Lab Control Sample	KQ1809004-03	18883.7	14.6397
Batch QCMS	KQ1809004-01	23328.5	14.6397
Batch QCDMS	KQ1809004-02	25095.5	14.6397
Batch QC	K1803850-019	33106.7	14.6139
PDI-SG-B078-BL1	K1804480-001	36222.7	14.6397

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1804480
Date Collected: N/A
Date Received: N/A
Date Analyzed: 07/20/18
Date Extracted: 07/6/18

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

Sample Name: Batch QC
Lab Code: K1803850-019
Analysis Method: ALS SOP
Prep Method: EPA 3541

Units: ug/Kg
Basis: Dry

Analyte Name	Sample Result	Matrix Spike KQ1809004-01			Duplicate Matrix Spike KQ1809004-02			% Rec Limits	RPD	RPD Limit
		Result	Spike	% Rec	Result	Spike	% Rec			
			Amount			Amount				
2,4'-DDD	ND U	7.83	6.82	115	7.98	6.79	118	32-169	2	40
2,4'-DDE	ND U	6.58	6.82	97	6.68	6.79	98	43-155	1	40
2,4'-DDT	ND U	9.46	6.82	139	9.76	6.79	144	55-161	3	40
4,4'-DDD	0.40	7.60	6.82	106	7.93	6.79	111	10-190	4	40
4,4'-DDE	1.1	9.32	6.82	121	9.49	6.79	124	35-162	2	40
4,4'-DDT	0.50	8.60	6.82	119	8.58	6.79	119	24-183	<1	40
Aldrin	ND U	6.20	6.82	91	8.13	6.79	120	52-151	27	40
alpha-Chlordane	ND U	9.14	6.82	134	8.91	6.79	131	31-156	3	40
cis-Nonachlor	ND U	9.34	6.82	137	10.2	6.79	150 *	27-144	9	40
Dieldrin	ND U	5.76	6.82	85	6.18	6.79	91	28-150	7	40
gamma-BHC (Lindane)	ND U	6.55	6.82	96	6.83	6.79	101	64-135	4	40
gamma-Chlordane	ND U	8.00	6.82	117	8.71	6.79	128	31-158	9	40
Heptachlor	ND U	7.09	6.82	104	7.18	6.79	106	76-117	1	40
trans-Nonachlor	ND U	9.62	6.82	141	8.77	6.79	129	35-153	9	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.

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QA/QC Report

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

Service Request: K1804480
Date Analyzed: 07/20/18
Date Extracted: 07/06/18

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

Analysis Method: ALS SOP
Prep Method: EPA 3541

Units: ug/Kg
Basis: Dry
Analysis Lot: 599464

Lab Control Sample
KQ1809004-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4'-DDD	2.15	2.00	107	73-122
2,4'-DDE	1.79	2.00	90	54-145
2,4'-DDT	2.65	2.00	133 *	77-118
4,4'-DDD	2.19	2.00	110	74-117
4,4'-DDE	2.18	2.00	109	66-132
4,4'-DDT	2.47	2.00	123 *	78-116
Aldrin	2.26	2.00	113	74-122
alpha-Chlordane	3.23	2.00	162 *	74-130
cis-Nonachlor	3.82	2.00	191 *	69-134
Dieldrin	1.79	2.00	89	62-131
gamma-BHC (Lindane)	2.23	2.00	112	79-116
gamma-Chlordane	2.96	2.00	148 *	76-128
Heptachlor	2.13	2.00	106	81-114
trans-Nonachlor	3.39	2.00	169 *	76-124

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QA/QC Report

Client: AECOM**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335**Sample Matrix:** Sediment**Service Request:** K1804480**Date Analyzed:** 07/20/18 18:33**Date Extracted:** 07/06/18**Method Blank Summary**
Organochlorine Pesticides by GC/MS/MS**Sample Name:** Method Blank**Instrument ID:** K-MSMS-01**Lab Code:** KQ1809004-04**File ID:** J:\MS21\Data\072018\072018F022.D**Analysis Method:** ALS SOP**Analysis Lot:** 599464**Prep Method:** EPA 3541**Extraction Lot:** 317186

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	KQ1809004-03	J:\MS21\Data\072018\072018F023.D\	07/20/18 19:00
Batch QCMS	KQ1809004-01	J:\MS21\Data\072018\072018F024.D\	07/20/18 19:28
Batch QCDMS	KQ1809004-02	J:\MS21\Data\072018\072018F025.D\	07/20/18 19:55
Batch QC	K1803850-019	J:\MS21\Data\072018\072018F034.D\	07/21/18 00:01
PDI-SG-B078-BL1	K1804480-001	J:\MS21\Data\072018\072018F036.D\	07/21/18 00:55

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QA/QC Report

Client: AECOM**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335**Sample Matrix:** Sediment**Service Request:** K1804480**Date Analyzed:** 07/20/18 19:00**Date Extracted:** 07/06/18**Lab Control Sample Summary**
Organochlorine Pesticides by GC/MS/MS**Sample Name:** Lab Control Sample**Instrument ID:** K-MSMS-01**Lab Code:** KQ1809004-03**File ID:** J:\MS21\Data\072018\072018F023.D**Analysis Method:** ALS SOP**Analysis Lot:** 599464**Prep Method:** EPA 3541**Extraction Lot:** 317186

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1809004-04	J:\MS21\Data\072018\072018F022.D\	07/20/18 18:33
Batch QCMS	KQ1809004-01	J:\MS21\Data\072018\072018F024.D\	07/20/18 19:28
Batch QCDMS	KQ1809004-02	J:\MS21\Data\072018\072018F025.D\	07/20/18 19:55
Batch QC	K1803850-019	J:\MS21\Data\072018\072018F034.D\	07/21/18 00:01
PDI-SG-B078-BL1	K1804480-001	J:\MS21\Data\072018\072018F036.D\	07/21/18 00:55

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QC/QC Report

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

Service Request: K1804480
Date Analyzed: 07/20/18 18:06

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: J:\MS21\Data\072018\072018F021.D\
Instrument ID: K-MSMS-01

Analytical Method: ALS SOP
Analysis Lot: 599464

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1809858-01	J:\MS21\Data\072018\072018F021.D\	07/20/18 18:06	
Method Blank	KQ1809004-04	J:\MS21\Data\072018\072018F022.D\	07/20/18 18:33	
Lab Control Sample	KQ1809004-03	J:\MS21\Data\072018\072018F023.D\	07/20/18 19:00	
Batch QC	KQ1809004-01	J:\MS21\Data\072018\072018F024.D\	07/20/18 19:28	
Batch QC	KQ1809004-02	J:\MS21\Data\072018\072018F025.D\	07/20/18 19:55	
Batch QC	K1803850-019	J:\MS21\Data\072018\072018F034.D\	07/21/18 00:01	
PDI-SG-B078-BL1	K1804480-001	J:\MS21\Data\072018\072018F036.D\	07/21/18 00:55	

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QA/QC Report

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

Service Request: K1804480
Calibration Date: 7/19/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800347
Instrument ID: K-MSMS-01

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800347-01		J:\MS21\Data\071918\071918F005.D	07/19/2018 10:46
02	KC1800347-02		J:\MS21\Data\071918\071918F006.D	07/19/2018 11:14
03	KC1800347-03		J:\MS21\Data\071918\071918F007.D	07/19/2018 11:43
04	KC1800347-04		J:\MS21\Data\071918\071918F008.D	07/19/2018 12:11
05	KC1800347-05		J:\MS21\Data\071918\071918F009.D	07/19/2018 12:40
06	KC1800347-06		J:\MS21\Data\071918\071918F010.D	07/19/2018 13:09
07	KC1800347-07		J:\MS21\Data\071918\071918F011.D	07/19/2018 13:37
08	KC1800347-08		J:\MS21\Data\071918\071918F012.D	07/19/2018 14:04
09	KC1800347-09		J:\MS21\Data\071918\071918F013.D	07/19/2018 14:31
10	KC1800347-10		J:\MS21\Data\071918\071918F014.D	07/19/2018 14:59

Analyte

2,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.4196	02	1.0	0.4572	03	2.0	0.4022	04	5.0	0.3774
05	10	0.3761	06	20	0.3903	07	40	0.3725	08	60	0.3898
09	80	0.371	10	100	0.3683						

2,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.3186	02	1.0	0.3218	03	2.0	0.3204	04	5.0	0.2823
05	10	0.2862	06	20	0.2911	07	40	0.2844	08	60	0.2838
09	80	0.2812	10	100	0.2708						

2,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.4874	02	1.0	0.4627	03	2.0	0.4311	04	5.0	0.4146
05	10	0.4533	06	20	0.4498	07	40	0.4754	08	60	0.4595
09	80	0.464	10	100	0.422						

4,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.6779	02	1.0	0.685	03	2.0	0.6055	04	5.0	0.5748
05	10	0.5557	06	20	0.5706	07	40	0.5473	08	60	0.5722
09	80	0.5669	10	100	0.5684						

4,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.2772	02	1.0	0.3149	03	2.0	0.2785	04	5.0	0.2476
05	10	0.2401	06	20	0.2605	07	40	0.2512	08	60	0.261
09	80	0.2562	10	100	0.2436						

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.6862	02	1.0	0.6551	03	2.0	0.6066	04	5.0	0.5986
05	10	0.6136	06	20	0.5888	07	40	0.6112	08	60	0.6076

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QA/QC Report

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

Service Request: K1804480
Calibration Date: 7/19/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800347
Instrument ID: K-MSMS-01

Signal ID: 1

Analyte

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
09	80	0.6306	10	100	0.5833						

Aldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.226	02	1.0	1.044	03	2.0	0.7161	04	5.0	0.8386
05	10	0.8629	06	20	0.7834	07	40	0.8419	08	60	0.8501
09	80	0.844	10	100	0.8195						

Dieldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
02	1.0	1.188	03	2.0	1.413	04	5.0	1.151	05	10	1.212
06	20	0.9966	07	40	1.01	08	60	0.9988	09	80	1.008
10	100	0.9492									

Heptachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.571	02	1.0	1.13	03	2.0	1.07	04	5.0	0.9555
05	10	0.9372	06	20	0.9268	07	40	0.8929	08	60	0.873
09	80	0.9291	10	100	0.8557						

S_4,4'-DDT-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	4.426	02	5	4.402	03	5	4.466	04	5	4.605
05	5	4.466	06	5	4.856	07	5	4.539	08	5	4.701
09	5	4.671	10	5	5.424						

S_4,4'DDD-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	10.18	02	5	9.779	03	5	9.812	04	5	9.947
05	5	9.58	06	5	9.679	07	5	9.53	08	5	9.293
09	5	9.616	10	5	10.2						

S_Aldrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.3295	02	20	0.3085	03	20	0.3477	04	20	0.3413
05	20	0.3462	06	20	0.3158	07	20	0.2948	08	20	0.2912
09	20	0.3277	10	20	0.2758						

S_Endrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1428	02	20	0.1273	03	20	0.1415	04	20	0.1465
05	20	0.1319	06	20	0.1381	07	20	0.1374	08	20	0.1389
09	20	0.1449	10	20	0.1478						

S_GBHCD6

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.8142	02	20	0.8162	03	20	0.7874	04	20	0.8385

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QA/QC Report

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

Service Request: K1804480
Calibration Date: 7/19/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800347
Instrument ID: K-MSMS-01

Signal ID: 1

Analyte

S_GBHCD6											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
05	20	0.7901	06	20	0.8053	07	20	0.7487	08	20	0.7659
09	20	0.8278	10	20	0.7312						

S_Heptachlor-13C10											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.3652	02	20	0.3724	03	20	0.3887	04	20	0.3991
05	20	0.3667	06	20	0.4058	07	20	0.391	08	20	0.4225
09	20	0.4433	10	20	0.4411						

S_Heptachlrepox13C10											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.2482	02	20	0.222	03	20	0.2446	04	20	0.2343
05	20	0.2381	06	20	0.2588	07	20	0.2204	08	20	0.2378
09	20	0.2744	10	20	0.2499						

S_Oxychlordan-13C10											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1026	02	20	0.1269	03	20	0.1244	04	20	0.1216
05	20	0.1218	06	20	0.1083	07	20	0.1084	08	20	0.1062
09	20	0.1203	10	20	0.1275						

alpha-Chlordane											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.507	02	1.0	4.69	03	2.0	3.362	04	5.0	3.141
05	10	2.947	06	20	3.257	07	40	3.356	08	60	3.371
09	80	3.296	10	100	2.998						

cis-Nonachlor											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.836	02	1.0	5.436	03	2.0	3.683	04	5.0	4.074
05	10	3.542	06	20	4.393	07	40	4.375	08	60	4.44
09	80	3.961	10	100	4.024						

gamma-BHC (Lindane)											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.5576	02	1.0	0.5868	03	2.0	0.5707	04	5.0	0.4741
05	10	0.5358	06	20	0.5132	07	40	0.5048	08	60	0.4966
09	80	0.5099	10	100	0.5168						

gamma-Chlordane											
#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.075	02	1.0	3.085	03	2.0	4.03	04	5.0	3.281
05	10	3.21	06	20	3.799	07	40	3.365	08	60	3.602
09	80	3.29	10	100	3.151						

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QA/QC Report

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

Service Request: K1804480
Calibration Date: 7/19/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800347
Instrument ID: K-MSMS-01

Signal ID: 1

Analyte

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	3.146	02	1.0	2.565	03	2.0	3.125	04	5.0	2.321
05	10	2.343	06	20	2.461	07	40	2.307	08	60	2.403
09	80	2.2	10	100	2.09						

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

Service Request: K1804480
Calibration Date: 7/19/2018

Initial Calibration Summary Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800347
Instrument ID: K-MSMS-01

Signal ID: 1

Analyte Name	Compound Type	Calibration Evaluation				Calibration Evaluation	
		Fit Type	Eval	Eval Result	Control Criteria	Average RRF	Minimum RRF
2,4'-DDD	TRG	Average RF	% RSD	7.1	≤20	0.3924	0.01
2,4'-DDE	TRG	Average RF	% RSD	6.4	≤20	0.2941	0.01
2,4'-DDT	TRG	Average RF	% RSD	5.1	≤20	0.452	0.01
4,4'-DDD	TRG	Average RF	% RSD	8.3	≤20	0.5924	0.01
4,4'-DDE	TRG	Average RF	% RSD	8.5	≤20	0.2631	0.01
4,4'-DDT	TRG	Average RF	% RSD	5.1	≤20	0.6182	0.01
Aldrin	TRG	Average RF	% RSD	16.5	≤20	0.8826	0.01
Dieldrin	TRG	Average RF	% RSD	13.6	≤20	1.103	0.01
Heptachlor	TRG	Quadratic	COD	0.9977	≥	1.014	0.01
S_4,4'-DDT-d4	SURR	Average RF	% RSD	6.6	≤	4.656	0.01
S_4,4'DDD-d4	SURR	Average RF	% RSD	2.9	≤	9.762	0.01
S_Aldrin-13C12	SURR	Average RF	% RSD	7.8	≤	0.3179	0.01
S_Endrin-13C12	SURR	Average RF	% RSD	4.6	≤	0.1397	0.01
S_GBHCD6	SURR	Average RF	% RSD	4.4	≤	0.7925	0.01
S_Heptachlor-13C10	SURR	Average RF	% RSD	7.2	≤	0.3996	0.01
S_Heptachlrepox13C10	SURR	Average RF	% RSD	6.7	≤	0.2428	0.01
S_Oxychlordane-13C10	SURR	Average RF	% RSD	8.0	≤	0.1168	0.01
alpha-Chlordane	TRG	Quadratic	COD	0.9966	≥	3.493	0.01
cis-Nonachlor	TRG	Average RF	% RSD	13.1	≤20	4.277	0.01
gamma-BHC (Lindane)	TRG	Average RF	% RSD	6.7	≤20	0.5266	0.01
gamma-Chlordane	TRG	Average RF	% RSD	10.5	≤20	3.489	0.01
trans-Nonachlor	TRG	Average RF	% RSD	14.5	≤20	2.496	0.01

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QA/QC Report

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

Service Request: K1804480
Calibration Date: 7/19/2018

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

Calibration ID: KC1800347
Instrument ID: K-MSMS-01

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800347-11		J:\MS21\Data\071918\071918F015.D	07/19/2018 15:26

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4'-DDD	20.0	18.3	3.924E-1	3.598E-1	-8.305	±25	Average RF
2,4'-DDE	20.0	19.4	2.941E-1	2.852E-1	-3.030	±25	Average RF
2,4'-DDT	20.0	18.0	4.52E-1	4.06E-1	-10.178	±25	Average RF
4,4'-DDD	20.0	18.6	5.924E-1	5.496E-1	-7.234	±25	Average RF
4,4'-DDE	20.0	17.9	2.631E-1	2.36E-1	-10.300	±25	Average RF
4,4'-DDT	20.0	19.7	6.182E-1	6.091E-1	-1.465	±25	Average RF
Aldrin	20.0	18.3	8.826E-1	8.078E-1	-8.483	±25	Average RF
alpha-Chlordane	20.0	23.2	3.493E0	3.88E0	16.13	±25	Quadratic
cis-Nonachlor	20.0	21.8	4.277E0	4.668E0	9.15	±25	Average RF
Dieldrin	20.0	20.1	1.103E0	1.107E0	0.402	±25	Average RF
gamma-BHC (Lindane)	20.0	20.5	5.266E-1	5.393E-1	2.40	±25	Average RF
gamma-Chlordane	20.0	22.7	3.489E0	3.954E0	13.33	±25	Average RF
Heptachlor	20.0	19.2	1.014E0	8.842E-1	-3.911	±25	Quadratic
trans-Nonachlor	20.0	21.0	2.496E0	2.62E0	4.95	±25	Average RF

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	5.45	9.762E0	1.064E1	109	50-200	Average RF
S_4,4'-DDT-d4	5.00	5.32	4.656E0	4.949E0	106	50-200	Average RF
S_Aldrin-13C12	20.0	20.6	3.179E-1	3.271E-1	103	50-200	Average RF
S_Endrin-13C12	20.0	21.6	1.397E-1	1.507E-1	108	50-200	Average RF
S_GBHCD6	20.0	19.9	7.925E-1	7.901E-1	99.5	50-200	Average RF
S_Heptachlor-13C10	20.0	17.5	3.996E-1	3.496E-1	87.5	50-200	Average RF
S_Heptachlrepox13C10	20.0	23.0	2.428E-1	2.796E-1	115	50-200	Average RF
S_Oxychlordan-13C10	20.0	18.9	1.168E-1	1.101E-1	94.5	50-200	Average RF

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QA/QC Report

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

Service Request: K1804480
Date Analyzed: 07/20/18 18:06

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

Analysis Method: ALS SOP
File ID: J:\MS21\Data\072018\072018F021.D\
Signal ID: 1

Calibration Date: 7/19/2018
Calibration ID: KC1800347
Analysis Lot: 599464
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	21.5	0.3924	0.4226	7.7	NA	±25	Average RF
2,4'-DDE	20.0	22.4	0.2941	0.3288	11.8	NA	±25	Average RF
2,4'-DDT	20.0	22.6	0.452	0.5098	12.8	NA	±25	Average RF
4,4'-DDD	20.0	19.8	0.5924	0.5869	-0.9	NA	±25	Average RF
4,4'-DDE	20.0	22.0	0.2631	0.29	10.2	NA	±25	Average RF
4,4'-DDT	20.0	19.9	0.6182	0.6141	-0.7	NA	±25	Average RF
Aldrin	20.0	17.9	0.8826	0.792	-10.3	NA	±25	Average RF
alpha-Chlordane	20.0	17.7	3.4925	2.9689	NA	-11.7	±25	Quadratic
cis-Nonachlor	20.0	15.5	4.2766	3.323	-22.3	NA	±25	Average RF
Dieldrin	20.0	20.7	1.1028	1.1434	3.7	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	20.3	0.5266	0.5332	1.3	NA	±25	Average RF
gamma-Chlordane	20.0	18.5	3.4888	3.2237	-7.6	NA	±25	Average RF
Heptachlor	20.0	20.4	1.0141	0.9365	NA	1.9	±25	Quadratic
trans-Nonachlor	20.0	17.3	2.4963	2.1576	-13.6	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	4.10	9.7616	8.0111	82.1	NA	50-200	Average RF
S_4,4'-DDT-d4	5.00	4.32	4.6555	4.0266	86.5	NA	50-200	Average RF
S_Aldrin-13C12	20.0	14.3	0.3179	0.2268	71.4	NA	50-200	Average RF
S_Endrin-13C12	20.0	15.7	0.1397	0.1098	78.6	NA	50-200	Average RF
S_GBHCd6	20.0	14.3	0.7925	0.5667	71.5	NA	50-200	Average RF
S_Heptachlor-13C10	20.0	15.0	0.3996	0.2993	74.9	NA	50-200	Average RF
S_Heptachlrepox13C10	20.0	15.3	0.2428	0.1857	76.5	NA	50-200	Average RF
S_Oxychlordane-13C10	20.0	15.8	0.1168	0.0925	79.2	NA	50-200	Average RF

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QA/QC Report

Client: AECOM

Service Request: K1804480

Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Analysis Lot: 599464

Instrument ID: K-MSMS-01

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
J:\MS21\Data\072018\072018F021.D\	Continuing Calibration Verification	KQ1809858-01	7/20/2018	18:06:32	
J:\MS21\Data\072018\072018F022.D\	Method Blank	KQ1809004-04	7/20/2018	18:33:41	
J:\MS21\Data\072018\072018F023.D\	Lab Control Sample	KQ1809004-03	7/20/2018	19:00:53	
J:\MS21\Data\072018\072018F024.D\	Batch QC MS	KQ1809004-01	7/20/2018	19:28:02	
J:\MS21\Data\072018\072018F025.D\	Batch QC DMS	KQ1809004-02	7/20/2018	19:55:09	
J:\MS21\Data\072018\072018F026.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	20:22:21	
J:\MS21\Data\072018\072018F027.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	20:49:31	
J:\MS21\Data\072018\072018F028.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	21:16:44	
J:\MS21\Data\072018\072018F029.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	21:43:56	
J:\MS21\Data\072018\072018F030.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	22:11:12	
J:\MS21\Data\072018\072018F031.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	22:38:22	
J:\MS21\Data\072018\072018F032.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	23:05:56	
J:\MS21\Data\072018\072018F033.D\	ZZZZZZZ	ZZZZZZZ	7/20/2018	23:33:08	
J:\MS21\Data\072018\072018F034.D\	Batch QC	K1803850-019	7/21/2018	00:01:05	
J:\MS21\Data\072018\072018F035.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	00:28:17	
J:\MS21\Data\072018\072018F036.D\	PDI-SG-B078-BL1	K1804480-001	7/21/2018	00:55:28	
J:\MS21\Data\072018\072018F037.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	01:22:41	
J:\MS21\Data\072018\072018F038.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	01:49:53	
J:\MS21\Data\072018\072018F039.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	02:17:05	
J:\MS21\Data\072018\072018F040.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	02:44:17	
J:\MS21\Data\072018\072018F041.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	03:11:29	
J:\MS21\Data\072018\072018F042.D\	ZZZZZZZ	ZZZZZZZ	7/21/2018	03:38:41	

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Prep Summary Report

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

Service Request:K1804480

Organochlorine Pesticides by GC/MS/MS

Prep Method: EPA 3541
Analytical Method: ALS SOP

Extraction Lot: 317186
Extraction Date: 07/06/18 10:30

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
Batch QC	K1803850-019	NA	NA	5.081 g	1 mL	58.0
PDI-SG-B078-BL1	K1804480-001	5/9/18	5/11/18	5.140 g	1 mL	69.5
Matrix Spike	KQ1809004-01MS	NA	NA	5.059 g	1 mL	58.0
Duplicate Matrix Spike	KQ1809004-02DMS	NA	NA	5.079 g	1 mL	58.0
Lab Control Sample	KQ1809004-03LCS	NA	NA	10 g	1 mL	
Method Blank	KQ1809004-04MB	NA	NA	10 g	1 mL	