



ALS Environmental
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October 29, 2018

Analytical Report for Service Request No: K1806651
Revised Service Request No: K1806651.01

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

RE: Portland Harbor Pre-Remedial Design Investigation / 60566335

Dear Amy,

Enclosed is the revised report for the sample(s) submitted to our laboratory July 16, 2018
For your reference, these analyses have been assigned our service request number **K1806651**.

Total Solids for sample -002 was removed.

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.

We apologize for any inconvenience this may have created.

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.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

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

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



Case Narrative

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

Service Request: K1806651
Date Received: 07/16/2018

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 07/16/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored frozen at -20°C upon receipt at the laboratory.

Semivolatiles by GC/MS:

Method ALS SOP, Organochlorine Pesticides by GC/MS/MS 09/18/2018: The upper control criterion was exceeded for 2,4'-DDD in Laboratory Control Sample (LCS) KQ1812265-03: 126, 73-122. The analyte 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 ALS SOP, 09/18/2018: The upper control criterion was exceeded for 4'-DDE and 4,4'-DDE in Continuing Calibration Verification (CCV) MS42\091818F002. The field samples analyzed in this sequence did contain 4,4'-DDE and per client instructions has been reported from this run. The apparent problem indicated a potential high bias, the data has been flagged to indicate the exceedance.

Method ALS SOP, 09/18/2018: The upper control criterion was exceeded for Aldrin in Matrix Spike (MS) KQ1812265-01 and Matrix Spike Duplicate (MSD) KQ1812265-02. The analyte 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 ALS SOP, Organochlorine Pesticides by GC/MS/MS 09/18/2018: The control criteria for matrix spike recovery of 4,4'-DDT for sample Batch QC were not applicable. The analyte concentration in the sample was significantly higher than the added spike concentration, preventing accurate evaluation of the spike recovery.



Approved by _____

Date 09/25/2018



Chain of Custody

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K1800651

ALS-Environmental-Kelso		SURFACE SEDIMENT										CHAIN OF CUSTODY						
1317-S-13th-Ave Kelso, WA 98626 Ph: 360-577-7222 Fax: 360-636-1068		Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010				Site Contact: Jennifer Ray Laboratory Contact: Howard-Holmes				7/5/2018		COC No: 1						
Client Contact		Analysis Turnaround Time				Carrier: Courier				1 of 1 pages								
AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Surface Sediment Sample Type: D/U		Calendar (C) or Work Days (W) <input checked="" type="checkbox"/> 21 days <input type="checkbox"/> Other _____																
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction											Sample Specific Notes:
PDI-SG-B483	7/13/2018	14:50	SS		LS	1	H											
PDI-SG-B487 <i>over B487 M 5266 WBH 7/16/2018 per AECOM</i>	7/13/2018	12:10	SS		LS	1	H											
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)																		
Special Instructions/QC Requirements & Comments:																		
H - Hold analyses pending further instruction.																		
Relinquished by: <i>[Signature]</i>		Company: AECOM		Date/Time: 7/16/18 1204		Received by: <i>[Signature]</i>		Company: HW		Date/Time: 7/16/18 1204								
Relinquished by: <i>[Signature]</i>		Company: HW		Date/Time: 7/16/18 1330		Received by: <i>[Signature]</i>		Company: ALS		Date/Time: 7/16/18 1330								
Relinquished by:		Company: HW		Date/Time:		Received by:		Company:		Date/Time:								



PC HL

Cooler Receipt and Preservation Form

Client AECOM Service Request K18 Olebs 1
 Received: 7/16/18 Opened: 7/16/18 By: [Signature] Unloaded: 7/16/18 By: [Signature]

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- Samples were received in: (circle) Cooler Box Envelope Other NA
- Were custody seals on coolers? NA Y N If yes, how many and where? _____
 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	Filec
4.5	4.3	-	-	-0.2	322	NA	NA	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



Total Solids

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Analysis Method: 160.3 Modified
Prep Method: None

Service Request: K1806651
Date Collected: 07/13/18
Date Received: 07/16/18
Units: Percent
Basis: As Received

Solids, Total

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
PDI-SG-B483	K1806651-001	50.2	-	-	1	07/17/18 17:56	

ALS Group USA, Corp.

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QA/QC Report

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

Service Request: K1806651
Date Collected: NA
Date Received: NA
Date Analyzed: 07/17/18

Replicate Sample Summary
Inorganic Parameters

Sample Name: Batch QC
Lab Code: K1806700-001

Units: Percent
Basis: As Received

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>MRL</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K1806700-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Solids, Total	160.3 Modified	-	-	80.3	80.0	80.2	<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.

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: K1806651
Date Collected: NA
Date Received: NA
Date Analyzed: 07/17/18

Triplicate Sample Summary
Inorganic Parameters

Sample Name: Batch QC
Lab Code: K1806700-001
Analysis Method: 160.3 Modified
Prep Method: None

Units: Percent
Basis: As Received

Analyte Name	MRL	MDL	Sample Result	Duplicate K1806700-001DUP Result	Triplicate K1806700-001TRP Result	Average	RSD	RSD Limit
Solids, Total	-	-	80.3	80.0	80.7	80.3	<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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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: PDI-SG-B483
Lab Code: K1806651-001

Service Request: K1806651
Date Collected: 07/13/18 14:50
Date Received: 07/16/18 13:30

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	0.39	0.25	1	09/18/18 17:23	9/6/18	*
2,4'-DDE	ND U	0.39	0.32	1	09/18/18 17:23	9/6/18	*
2,4'-DDT	ND U	0.39	0.38	1	09/18/18 17:23	9/6/18	
4,4'-DDD	0.51	0.39	0.14	1	09/18/18 17:23	9/6/18	
4,4'-DDE	1.4	0.39	0.28	1	09/18/18 17:23	9/6/18	*
4,4'-DDT	ND U	0.39	0.19	1	09/18/18 17:23	9/6/18	
Aldrin	ND U	0.39	0.32	1	09/18/18 17:23	9/6/18	
alpha-Chlordane	ND U	0.79	0.25	1	09/18/18 17:23	9/6/18	
cis-Nonachlor	ND U	0.39	0.39	1	09/18/18 17:23	9/6/18	
Dieldrin	ND U	0.79	0.31	1	09/18/18 17:23	9/6/18	
gamma-BHC (Lindane)	ND U	0.39	0.13	1	09/18/18 17:23	9/6/18	
gamma-Chlordane	ND U	0.79	0.26	1	09/18/18 17:23	9/6/18	
Heptachlor	ND U	0.39	0.16	1	09/18/18 17:23	9/6/18	
Oxychlordane	ND U	0.79	0.52	1	09/18/18 17:23	9/6/18	
trans-Nonachlor	ND U	0.79	0.23	1	09/18/18 17:23	9/6/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	34	5 - 120	09/18/18 17:23	
S_4,4'-DDT-d4	37	13 - 200	09/18/18 17:23	
S_Aldrin-13C12	21	10 - 143	09/18/18 17:23	
S_Endrin-13C12	31	20 - 157	09/18/18 17:23	
S_GBHCd6	19	5 - 124	09/18/18 17:23	
S_Heptachlor-13C10	21	10 - 177	09/18/18 17:23	
S_Heptachlrepox13C10	21	8 - 146	09/18/18 17:23	
S_Oxychlordane-13C10	19	5 - 144	09/18/18 17:23	

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Analytical Report

Client: AECOM
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment
Sample Name: Method Blank
Lab Code: KQ1812265-04

Service Request: K1806651
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	09/18/18 10:37	9/6/18	
2,4'-DDE	ND U	0.10	0.079	1	09/18/18 10:37	9/6/18	
2,4'-DDT	ND U	0.10	0.094	1	09/18/18 10:37	9/6/18	
4,4'-DDD	ND U	0.10	0.035	1	09/18/18 10:37	9/6/18	
4,4'-DDE	ND U	0.10	0.070	1	09/18/18 10:37	9/6/18	
4,4'-DDT	ND U	0.10	0.047	1	09/18/18 10:37	9/6/18	
Aldrin	ND U	0.10	0.079	1	09/18/18 10:37	9/6/18	
alpha-Chlordane	ND U	0.20	0.062	1	09/18/18 10:37	9/6/18	
cis-Nonachlor	ND U	0.10	0.097	1	09/18/18 10:37	9/6/18	
Dieldrin	ND U	0.20	0.077	1	09/18/18 10:37	9/6/18	
gamma-BHC (Lindane)	ND U	0.10	0.031	1	09/18/18 10:37	9/6/18	
gamma-Chlordane	ND U	0.20	0.064	1	09/18/18 10:37	9/6/18	
Heptachlor	ND U	0.10	0.039	1	09/18/18 10:37	9/6/18	
Oxychlordane	ND U	0.20	0.13	1	09/18/18 10:37	9/6/18	
trans-Nonachlor	ND U	0.20	0.058	1	09/18/18 10:37	9/6/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
S_4,4'DDD-d4	24	5 - 120	09/18/18 10:37	
S_4,4'-DDT-d4	22	13 - 200	09/18/18 10:37	
S_Aldrin-13C12	32	10 - 143	09/18/18 10:37	
S_Endrin-13C12	24	20 - 157	09/18/18 10:37	
S_GBHCD6	26	5 - 124	09/18/18 10:37	
S_Heptachlor-13C10	17	10 - 177	09/18/18 10:37	
S_Heptachlrepox13C10	21	8 - 146	09/18/18 10:37	
S_Oxychlordane-13C10	24	5 - 144	09/18/18 10:37	

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: K1806651

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	K1806207-021	38	39	25
PDI-SG-B483	K1806651-001	34	37	21
Method Blank	KQ1812265-04	24	22	32
Lab Control Sample	KQ1812265-03	35	32	39
Batch QC	KQ1812265-01	25	24	23
Batch QC	KQ1812265-02	44	45	36

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

Service Request: K1806651

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	K1806207-021	38	22	24
PDI-SG-B483	K1806651-001	31	19	21
Method Blank	KQ1812265-04	24	26	17
Lab Control Sample	KQ1812265-03	36	35	23
Batch QC	KQ1812265-01	24	21	15
Batch QC	KQ1812265-02	47	31	27

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: K1806651

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP
Extraction Method: EPA 3541

Sample Name	Lab Code	S_Heptachlrepx13C10	S_Oxychlorane-13C10
		8-146	5-144
Batch QC	K1806207-021	23	22
PDI-SG-B483	K1806651-001	21	19
Method Blank	KQ1812265-04	21	24
Lab Control Sample	KQ1812265-03	28	28
Batch QC	KQ1812265-01	19	18
Batch QC	KQ1812265-02	32	30

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1806651
Date Analyzed: 09/18/18 10:20

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

File ID: Y:\MS42\data\091818\091818F002.D
Instrument ID: K-MS-42
Analysis Method: ALS SOP

Lab Code: KQ1813120-01
Analysis Lot: 607411
Signal ID: 1

	Pyrene-d10	
	Area	RT
Result ==>	26,505,151	9.806
Upper Limit ==>	53,010,302	10.31
Lower Limit ==>	13,252,575	9.31

Associated Analyses

Method Blank	KQ1812265-04	25851645.08	9.799
Lab Control Sample	KQ1812265-03	32606425.49	9.793
Batch QCMS	KQ1812265-01	44729928.89	9.806
Batch QCDMS	KQ1812265-02	49051938.06	9.799
Batch QC	K1806207-021	44852372.97	9.799
PDI-SG-B483	K1806651-001	50995188.65	9.806

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: K1806651
Date Collected: N/A
Date Received: N/A
Date Analyzed: 09/18/18
Date Extracted: 09/6/18

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

Sample Name: Batch QC
Lab Code: K1806207-021
Analysis Method: ALS SOP
Prep Method: EPA 3541

Units: ug/Kg
Basis: Dry

Analyte Name	Sample Result	Result	Matrix Spike KQ1812265-01		Duplicate Matrix Spike KQ1812265-02		% Rec Limits	RPD	RPD Limit	
			Spike Amount	% Rec	Result	Spike Amount				% Rec
2,4'-DDD	0.37 J	8.39	7.36	109	8.20	7.39	106	32-169	2	40
2,4'-DDE	ND U	9.51	7.36	129	8.22	7.39	111	43-155	15	40
2,4'-DDT	ND U	6.66	7.36	90	6.30	7.39	85	55-161	6	40
4,4'-DDD	3.5	10.1	7.36	90	10.7	7.39	98	10-190	5	40
4,4'-DDE	3.7	15.5	7.36	161	13.3	7.39	130	35-162	16	40
4,4'-DDT	29	6.81	7.36	-301 *	6.41	7.39	-305 *	24-183	6	40
Aldrin	ND U	17.0	7.36	231 *	16.6	7.39	225 *	52-151	2	40
alpha-Chlordane	ND U	8.76	7.36	119	7.99	7.39	108	31-156	9	40
cis-Nonachlor	ND U	7.50	7.36	102	6.90	7.39	93	27-144	8	40
Dieldrin	ND U	8.02	7.36	109	6.28	7.39	85	28-150	24	40
gamma-BHC (Lindane)	ND U	6.31	7.36	86	5.83	7.39	79	64-135	8	40
gamma-Chlordane	ND U	9.62	7.36	131	8.34	7.39	113	31-158	14	40
Heptachlor	ND U	7.43	7.36	101	7.29	7.39	99	76-117	2	40
Oxychlordane	ND U	8.17	7.36	111	7.32	7.39	99	53-144	11	40
trans-Nonachlor	ND U	7.86	7.36	107	7.00	7.39	95	35-153	12	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.

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: K1806651
Date Analyzed: 09/18/18
Date Extracted: 09/06/18

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: 607411

Lab Control Sample
KQ1812265-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4'-DDD	2.53	2.00	126 *	73-122
2,4'-DDE	2.56	2.00	128	54-145
2,4'-DDT	1.95	2.00	97	77-118
4,4'-DDD	1.96	2.00	98	74-117
4,4'-DDE	2.60	2.00	130	66-132
4,4'-DDT	1.96	2.00	98	78-116
Aldrin	2.04	2.00	102	74-122
alpha-Chlordane	2.13	2.00	106	74-130
cis-Nonachlor	2.01	2.00	101	69-134
Dieldrin	2.14	2.00	107	62-131
gamma-BHC (Lindane)	1.63	2.00	81	79-116
gamma-Chlordane	2.32	2.00	116	76-128
Heptachlor	2.15	2.00	107	81-114
Oxychlordane	2.08	2.00	104	59-141
trans-Nonachlor	2.05	2.00	102	76-124

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: K1806651
Date Analyzed: 09/18/18 10:55
Date Extracted: 09/06/18

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

Sample Name: Lab Control Sample **Instrument ID:** K-MS-42
Lab Code: KQ1812265-03 **File ID:** Y:\MS42\data\091818\091818F004.D
Analysis Method: ALS SOP **Analysis Lot:** 607411
Prep Method: EPA 3541 **Extraction Lot:** 321269

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	KQ1812265-04	Y:\MS42\data\091818\091818F003.D	09/18/18 10:37
Batch QCMS	KQ1812265-01	Y:\MS42\data\091818\091818F005.D	09/18/18 11:13
Batch QCDMS	KQ1812265-02	Y:\MS42\data\091818\091818F006.D	09/18/18 11:30
Batch QC	K1806207-021	Y:\MS42\data\091818\091818F018.D	09/18/18 15:02
PDI-SG-B483	K1806651-001	Y:\MS42\data\091818\091818F026.D	09/18/18 17:23

ALS Group USA, Corp.
dba ALS Environmental

QC/QC Report

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

Service Request: K1806651
Date Analyzed: 09/18/18 10:20

Tune Summary
Organochlorine Pesticides by GC/MS/MS

File ID: Y:\MS42\data\091818\091818F002.D
Instrument ID: K-MS-42

Analytical Method: ALS SOP
Analysis Lot: 607411

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	KQ1813120-01	Y:\MS42\data\091818\091818F002.D	09/18/18 10:20	
Method Blank	KQ1812265-04	Y:\MS42\data\091818\091818F003.D	09/18/18 10:37	
Lab Control Sample	KQ1812265-03	Y:\MS42\data\091818\091818F004.D	09/18/18 10:55	
Batch QC	KQ1812265-01	Y:\MS42\data\091818\091818F005.D	09/18/18 11:13	
Batch QC	KQ1812265-02	Y:\MS42\data\091818\091818F006.D	09/18/18 11:30	
Batch QC	K1806207-021	Y:\MS42\data\091818\091818F018.D	09/18/18 15:02	
PDI-SG-B483	K1806651-001	Y:\MS42\data\091818\091818F026.D	09/18/18 17:23	

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

Service Request: K1806651
Calibration Date: 9/14/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800441
Instrument ID: K-MS-42

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
01	KC1800441-01	OC PEST ICAL 0.5ng/mL SVM59-48A	091418F012.D	09/14/2018 16:03
02	KC1800441-02	OC PEST ICAL 1ng/mL SVM59-48B	091418F013.D	09/14/2018 16:21
03	KC1800441-03	OC PEST ICAL 2ng/mL SVM59-48C	091418F014.D	09/14/2018 16:38
04	KC1800441-04	OC PEST ICAL 5ng/mL SVM59-48D	091418F015.D	09/14/2018 16:56
05	KC1800441-05	OC PEST ICAL 10ng/mL SVM59-48E	091418F016.D	09/14/2018 17:14
06	KC1800441-06	OC PEST ICAL 20ng/mL SVM59-48F	091418F017.D	09/14/2018 17:31
07	KC1800441-07	OC PEST ICAL 40ng/mL SVM59-48G	091418F018.D	09/14/2018 17:49
08	KC1800441-08	OC PEST ICAL 60ng/mL SVM59-48H	091418F019.D	09/14/2018 18:06
09	KC1800441-09	OC PEST ICAL 80ng/mL SVM59-48I	091418F020.D	09/14/2018 18:24
10	KC1800441-10	OC PEST ICAL 100ng/mL SVM59-48J	091418F021.D	09/14/2018 18:42

Analyte

2,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.994	02	1	0.9978	03	2	0.9611	04	5	0.9228
05	10	0.9733	06	20	0.9803	07	40	0.9627	08	60	1.066
09	80	0.9762	10	100	0.9224						

2,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.045	02	1	1.02	03	2	0.9648	04	5	0.9128
05	10	0.9735	06	20	1.064	07	40	1.001	08	60	1.017
09	80	1.019	10	100	1.033						

2,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.222	02	1	2.221	03	2	2.206	04	5	2.423
05	10	2.485	06	20	2.554	07	40	2.522	08	60	2.639
09	80	2.783	10	100	2.968						

4,4'-DDD

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.838	02	1	1.608	03	2	1.656	04	5	1.582
05	10	1.604	06	20	1.628	07	40	1.572	08	60	1.674
09	80	1.669	10	100	1.618						

4,4'-DDE

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.8126	02	1	0.9334	03	2	0.8258	04	5	0.7969
05	10	0.8125	06	20	0.8347	07	40	0.7645	08	60	1.018
09	80	0.802	10	100	0.7823						

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

Service Request: K1806651
Calibration Date: 9/14/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800441
Instrument ID: K-MS-42

Signal ID: 1

Analyte

4,4'-DDT

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.14	02	1	1.115	03	2	1.081	04	5	1.156
05	10	1.139	06	20	1.013	07	40	1.05	08	60	1.115
09	80	1.112	10	100	1.208						

Aldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	4.307	02	1	2.438	03	2	1.521	04	5	0.951
05	10	0.8011	06	20	0.7153	07	40	0.6392	08	60	0.6323
09	80	0.7077	10	100	0.6552						

Dieldrin

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.58	02	1	1.512	03	2	1.505	04	5	1.341
05	10	1.622	06	20	1.938	07	40	1.991	08	60	2.105
09	80	2.338	10	100	1.801						

Heptachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.16	02	1	1.114	03	2	1.085	04	5	1.084
05	10	1.075	06	20	1.141	07	40	1.091	08	60	1.11
09	80	1.054	10	100	1.104						

Oxychlorane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	3.059	02	1	2.848	03	2	2.861	04	5	2.767
05	10	2.878	06	20	2.807	07	40	2.753	08	60	2.875
09	80	2.76	10	100	2.834						

S_4,4'-DDT-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	1.755	02	5	1.472	03	5	1.607	04	5	1.327
05	5	1.352	06	5	1.376	07	5	1.381	08	5	1.396
09	5	1.452	10	5	1.502						

S_4,4'DDD-d4

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	5	3.225	02	5	3.026	03	5	3.121	04	5	2.961
05	5	2.916	06	5	3.107	07	5	3.286	08	5	3.315
09	5	3.56	10	5	4.144						

S_Aldrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.4903	02	20	0.5227	03	20	0.4819	04	20	0.4882
05	20	0.4662	06	20	0.5541	07	20	0.5605	08	20	0.5759
09	20	0.5298	10	20	0.6299						

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request: K1806651
Calibration Date: 9/14/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800441
Instrument ID: K-MS-42

Signal ID: 1

Analyte

S_Endrin-13C12

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1565	02	20	0.1502	03	20	0.1445	04	20	0.1335
05	20	0.1224	06	20	0.1167	07	20	0.1155	08	20	0.1235
09	20	0.1176	10	20	0.1673						

S_GBHCD6

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	1.453	02	20	1.627	03	20	1.618	04	20	1.433
05	20	1.488	06	20	1.696	07	20	1.746	08	20	1.707
09	20	1.589	10	20	1.866						

S_Heptachlor-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.6306	02	20	0.6153	03	20	0.6619	04	20	0.5895
05	20	0.6505	06	20	0.6637	07	20	0.6548	08	20	0.6705
09	20	0.6555	10	20	0.7213						

S_Heptachlrepx13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.1639	02	20	0.1666	03	20	0.1634	04	20	0.1559
05	20	0.1613	06	20	0.1719	07	20	0.1801	08	20	0.1715
09	20	0.1766	10	20	0.2053						

S_Oxychlordane-13C10

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	20	0.3758	02	20	0.3953	03	20	0.3828	04	20	0.3616
05	20	0.3659	06	20	0.4178	07	20	0.4205	08	20	0.4084
09	20	0.4296	10	20	0.4918						

alpha-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.536	02	1	2.31	03	2	2.284	04	5	2.226
05	10	2.421	06	20	2.367	07	40	2.381	08	60	2.47
09	80	2.404	10	100	2.393						

cis-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.6255	02	1	0.6109	03	2	0.6089	04	5	0.6227
05	10	0.654	06	20	0.6245	07	40	0.6586	08	60	0.7003
09	80	0.6687	10	100	0.6764						

gamma-BHC (Lindane)

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	2.49	02	1	2.241	03	2	2.262	04	5	2.402
05	10	2.359	06	20	2.416	07	40	2.363	08	60	2.434
09	80	2.501	10	100	2.6						

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

Service Request: K1806651
Calibration Date: 9/14/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800441
Instrument ID: K-MS-42

Signal ID: 1

Analyte

gamma-Chlordane

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	0.9502	02	1	0.903	03	2	0.911	04	5	0.8948
05	10	0.8707	06	20	0.9503	07	40	0.9055	08	60	1.019
09	80	0.9271	10	100	0.9592						

trans-Nonachlor

#	Amount	RF	#	Amount	RF	#	Amount	RF	#	Amount	RF
01	0.5	1.627	02	1	1.512	03	2	1.506	04	5	1.446
05	10	1.554	06	20	1.553	07	40	1.632	08	60	1.69
09	80	1.673	10	100	1.632						

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

Service Request: K1806651
Calibration Date: 9/14/2018

Initial Calibration Summary
Organochlorine Pesticides by GC/MS/MS

Calibration ID: KC1800441
Instrument ID: K-MS-42

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	4.2	20	0.9757	0.01
2,4'-DDE	TRG	Average RF	% RSD	4.4	20	1.005	0.01
2,4'-DDT	TRG	Average RF	% RSD	10.1	20	2.502	0.01
4,4'-DDD	TRG	Average RF	% RSD	4.6	20	1.645	0.01
4,4'-DDE	TRG	Average RF	% RSD	9.3	20	0.8383	0.01
4,4'-DDT	TRG	Average RF	% RSD	4.9	20	1.113	0.01
Aldrin	TRG	Quadratic	COD	0.9958		1.337	0.01
Dieldrin	TRG	Average RF	% RSD	17.7	20	1.773	0.01
Heptachlor	TRG	Average RF	% RSD	2.9	20	1.102	0.01
Oxychlordane	TRG	Average RF	% RSD	3.1	20	2.844	0.01
S_4,4'-DDT-d4	SURR	Average RF	% RSD	9.0		1.462	0.01
S_4,4'DDD-d4	SURR	Average RF	% RSD	11.1		3.266	0.01
S_Aldrin-13C12	SURR	Average RF	% RSD	9.6		0.5299	0.01
S_Endrin-13C12	SURR	Average RF	% RSD	13.8		0.1348	0.01
S_GBHCD6	SURR	Average RF	% RSD	8.5		1.622	0.01
S_Heptachlor-13C10	SURR	Average RF	% RSD	5.4		0.6513	0.01
S_Heptachlrepx13C10	SURR	Average RF	% RSD	8.1		0.1717	0.01
S_Oxychlordane-13C10	SURR	Average RF	% RSD	9.5		0.4049	0.01
alpha-Chlordane	TRG	Average RF	% RSD	3.8	20	2.379	0.01
cis-Nonachlor	TRG	Average RF	% RSD	4.8	20	0.645	0.01
gamma-BHC (Lindane)	TRG	Average RF	% RSD	4.5	20	2.407	0.01
gamma-Chlordane	TRG	Average RF	% RSD	4.5	20	0.9291	0.01
trans-Nonachlor	TRG	Average RF	% RSD	5.1	20	1.582	0.01

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

Service Request: K1806651
Calibration Date: 9/14/2018

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

Calibration ID: KC1800441
Instrument ID: K-MS-42

Signal ID: 1

#	Lab Code	Sample Name	File Location	Acquisition Date
11	KC1800441-11	OC PEST ICV 20ng/mL SVM59-48K	091418F022.D	09/14/2018 18:59

Analyte Name	Expected	Result	Average RF	SSV RF	% D	Criteria	Curve Fit
2,4'-DDD	20.0	21.5	9.757E-1	1.047E0	7.32	±25	Average RF
2,4'-DDE	20.0	23.1	1.005E0	1.159E0	15.36	±25	Average RF
2,4'-DDT	20.0	19.3	2.502E0	2.415E0	-3.493	±25	Average RF
4,4'-DDD	20.0	21.7	1.645E0	1.783E0	8.42	±25	Average RF
4,4'-DDE	20.0	23.6	8.383E-1	9.889E-1	17.96	±25	Average RF
4,4'-DDT	20.0	18.2	1.113E0	1.012E0	-9.032	±25	Average RF
Aldrin	20.0	21.4	1.337E0	7.37E-1	6.87	±25	Quadratic
alpha-Chlordane	20.0	19.5	2.379E0	2.323E0	-2.355	±25	Average RF
cis-Nonachlor	20.0	17.2	6.45E-1	5.54E-1	-14.118	±25	Average RF
Dieldrin	20.0	22.9	1.773E0	2.029E0	14.44	±25	Average RF
gamma-BHC (Lindane)	20.0	20.5	2.407E0	2.472E0	2.69	±25	Average RF
gamma-Chlordane	20.0	17.9	9.291E-1	8.301E-1	-10.656	±25	Average RF
Heptachlor	20.0	20.4	1.102E0	1.124E0	2.02	±25	Average RF
Oxychlordane	20.0	19.6	2.844E0	2.788E0	-1.975	±25	Average RF
trans-Nonachlor	20.0	18.5	1.582E0	1.462E0	-7.619	±25	Average RF

Analyte Name	Expected	Result	Average RF	SSV RF	Rec.	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	4.57	3.266E0	2.986E0	91.4	50-200	Average RF
S_4,4'-DDT-d4	5.00	4.68	1.462E0	1.368E0	93.6	50-200	Average RF
S_Aldrin-13C12	20.0	20.9	5.299E-1	5.539E-1	105	50-200	Average RF
S_Endrin-13C12	20.0	16.8	1.348E-1	1.133E-1	84.0	50-200	Average RF
S_GBHCd6	20.0	22.5	1.622E0	1.821E0	113	50-200	Average RF
S_Heptachlor-13C10	20.0	20.7	6.513E-1	6.726E-1	104	50-200	Average RF
S_Heptachlrepx13C10	20.0	19.3	1.717E-1	1.654E-1	96.5	50-200	Average RF
S_Oxychlordane-13C10	20.0	23.0	4.049E-1	4.664E-1	115	50-200	Average RF

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

Service Request: K1806651
Date Analyzed: 09/18/18 10:20

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

Analysis Method: ALS SOP
File ID: Y:\MS42\data\091818\091818F002.D
Signal ID: 1

Calibration Date: 9/14/2018
Calibration ID: KC1800441
Analysis Lot: 607411
Units: ng/mL

Analyte Name	Expected	Result	Average RF	CCV RF	% D	% Drift	Criteria	Curve Fit
2,4'-DDD	20.0	21.9	0.9757	1.0667	9.3	NA	±25	Average RF
2,4'-DDE	20.0	27.6	1.005	1.3882	38.1*	NA	±25	Average RF
2,4'-DDT	20.0	18.9	2.5024	2.365	-5.5	NA	±25	Average RF
4,4'-DDD	20.0	20.0	1.645	1.6415	-0.2	NA	±25	Average RF
4,4'-DDE	20.0	30.9	0.8383	1.2948	54.5*	NA	±25	Average RF
4,4'-DDT	20.0	18.2	1.1129	1.015	-8.8	NA	±25	Average RF
Aldrin	20.0	20.0	1.3367	0.696	NA	0.2	±25	Quadratic
alpha-Chlordane	20.0	21.4	2.3791	2.5464	7.0	NA	±25	Average RF
cis-Nonachlor	20.0	19.8	0.645	0.6402	-0.8	NA	±25	Average RF
Dieldrin	20.0	25.0	1.7732	2.2209	25.2	NA	±25	Average RF
gamma-BHC (Lindane)	20.0	18.0	2.4069	2.1639	-10.1	NA	±25	Average RF
gamma-Chlordane	20.0	22.0	0.9291	1.02	9.8	NA	±25	Average RF
Heptachlor	20.0	19.5	1.1018	1.0726	-2.6	NA	±25	Average RF
Oxychlordane	20.0	19.9	2.8442	2.8357	-0.3	NA	±25	Average RF
trans-Nonachlor	20.0	22.1	1.5824	1.7489	10.5	NA	±25	Average RF

Analyte Name	Expected	Result	Average RF	CCV RF	Rec.	% Drift	Criteria	Curve Fit
S_4,4'DDD-d4	5.00	3.44	3.2662	2.2442	68.7	NA	50-200	Average RF
S_4,4'-DDT-d4	5.00	3.29	1.4619	0.9616	65.8	NA	50-200	Average RF
S_Aldrin-13C12	20.0	17.5	0.5299	0.4637	87.5	NA	50-200	Average RF
S_Endrin-13C12	20.0	12.8	0.1348	0.0862	64.0	NA	50-200	Average RF
S_GBHCD6	20.0	17.6	1.6222	1.4257	87.9	NA	50-200	Average RF
S_Heptachlor-13C10	20.0	10.8	0.6513	0.3504	53.8	NA	50-200	Average RF
S_Heptachlrepx13C10	20.0	13.8	0.1717	0.1184	69.0	NA	50-200	Average RF
S_Oxychlordane-13C10	20.0	14.7	0.4049	0.2974	73.4	NA	50-200	Average RF

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

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

Service Request:K1806651

Analysis Run Log
Organochlorine Pesticides by GC/MS/MS

Analysis Method: ALS SOP

Analysis Lot:607411

Instrument ID:K-MS-42

Raw Data File	Sample Name	Lab Code	Date Analyzed	Time Analyzed	Q
Y:\MS42\data\091818\091818F002.D	Continuing Calibration Verification	KQ1813120-01	9/18/2018	10:20	
Y:\MS42\data\091818\091818F003.D	Method Blank	KQ1812265-04	9/18/2018	10:37	
Y:\MS42\data\091818\091818F004.D	Lab Control Sample	KQ1812265-03	9/18/2018	10:55	
Y:\MS42\data\091818\091818F005.D	Batch QC MS	KQ1812265-01	9/18/2018	11:13	
Y:\MS42\data\091818\091818F006.D	Batch QC DMS	KQ1812265-02	9/18/2018	11:30	
Y:\MS42\data\091818\091818F007.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	11:48	
Y:\MS42\data\091818\091818F008.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	12:05	
Y:\MS42\data\091818\091818F009.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	12:23	
Y:\MS42\data\091818\091818F010.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	12:41	
Y:\MS42\data\091818\091818F011.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	12:58	
Y:\MS42\data\091818\091818F012.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	13:16	
Y:\MS42\data\091818\091818F013.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	13:34	
Y:\MS42\data\091818\091818F014.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	13:51	
Y:\MS42\data\091818\091818F015.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	14:09	
Y:\MS42\data\091818\091818F016.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	14:26	
Y:\MS42\data\091818\091818F017.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	14:44	
Y:\MS42\data\091818\091818F018.D	Batch QC	K1806207-021	9/18/2018	15:02	
Y:\MS42\data\091818\091818F019.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	15:19	
Y:\MS42\data\091818\091818F020.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	15:37	
Y:\MS42\data\091818\091818F021.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	15:55	
Y:\MS42\data\091818\091818F022.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	16:12	
Y:\MS42\data\091818\091818F023.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	16:30	
Y:\MS42\data\091818\091818F024.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	16:47	
Y:\MS42\data\091818\091818F025.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	17:05	
Y:\MS42\data\091818\091818F026.D	PDI-SG-B483	K1806651-001	9/18/2018	17:23	
Y:\MS42\data\091818\091818F027.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	17:40	
Y:\MS42\data\091818\091818F028.D	ZZZZZZZ	ZZZZZZZ	9/18/2018	17:58	

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Prep Summary Report

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

Service Request:K1806651

Organochlorine Pesticides by GC/MS/MS

Prep Method: EPA 3541
Analytical Method: ALS SOP

Extraction Lot: 321269
Extraction Date: 09/06/18 17:05

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Amount	Percent Solids
Batch QC	K1806207-021	NA	NA	5.043 g	1 mL	53.3
PDI-SG-B483	K1806651-001	7/13/18	7/16/18	5.059 g	1 mL	50.2
Matrix Spike	KQ1812265-01MS	NA	NA	5.096 g	1 mL	53.3
Duplicate Matrix Spike	KQ1812265-02DMS	NA	NA	5.078 g	1 mL	53.3
Lab Control Sample	KQ1812265-03LCS	NA	NA	10 g	1 mL	
Method Blank	KQ1812265-04MB	NA	NA	10 g	1 mL	