ALS Environmental
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September 25, 2018

**Analytical Report for Service Request No:** K1806305

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 July 05, 2018
For your reference, these analyses have been assigned our service request number **K1806305.**

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.<br>*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.<br>*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.<br>*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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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

**Client:** AECOM
**Project:** Portland Harbor Pre-Remedial Design Investigation
**Sample Matrix:** Sediment, Water

**Service Request:** K1806305
**Date Received:** 07/05/2018

## 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:**

Ten sediment samples and one water sample were received for analysis at ALS Environmental on 07/05/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored frozen at -20ºC upon receipt at the laboratory.

**Semivolatiles by GC/MS:**

Method ALS SOP, Organochlorine Pesticides by GC/MS/MS 09/13/2018: The internal standard recovery of Pyrene-d10 in all samples was outside control criteria because of suspected matrix interference. The results quantified using this internal standard were flagged to indicate the problem. All labeled surrogates and associated QC results impacted by the internal standards were within acceptance criteria indicating that the batch was in control. No further corrective action was taken.

Method ALS SOP, Organochlorine Pesticides by GC/MS/MS 09/13/2018: The matrix spike recovery of 4,4'-DDT for sample Batch QC was outside control criteria because of suspected matrix interference. The data has been flagged to indicate the problem.

Method ALS SOP, 07/19/2018:The upper control criterion was exceeded for S_4,4'DDD-d4 in the Method Blank KQ1809076-03, Laboratory Control Sample KQ1809076-01, and Duplicate Laboratory Control Sample KQ1809076-02. No target analytes were detected in the field sample. The error associated with an elevated recovery equated to a high bias. The quality of the sample data was not significantly affected. No further corrective action was appropriate.

Method ALS SOP, Organochlorine Pesticides by GC/MS/MS 07/19/2018: The upper control criterion was exceeded for 4,4'-DDT (117, 85-113) and cis-Nonachlor (213, 227, 59-138) in Laboratory Control Samples (LCS/DLCS) KQ1809076-01/02. The analytes in question were 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 07/19/2018:The spike recovery of 2,4'-DDE (47, 50, 75-117), and 4,4'-DDE (60, 69, 76-115) for Laboratory Control Samples (LCS/DLCS) KQ1809076-01/02 was outside the lower control criterion. The analytes in question were not detected in the associated field sample. The error associated with reduced recovery indicated a potential low bias. The data was flagged to indicate the problem.

**SMO:**

No significant anomalies were noted with this analysis.

Approved by _____ Date 09/25/2018

# Chain of Custody

**ALS Environmental—Kelso Laboratory**
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K1806305

| ALS-Environmental-Kelso | SURFACE SEDIMENT CHAIN OF CUSTODY | | |
|---|---|---|---|
| 1317-S-13th-Ave | | | |
| Kelso, WA 98626 | | | |
| Ph: 360-577-7222 Fax: 360-636-1068 | | | |
| **Client Contact** | **Project Contact: Amy Dahl / Chelsey Cook** | **Site Contact: Jennifer Ray** | **7/5/2018** COC No: 1 |
| AECOM | **Tel: (206) 438-2261 / (206) 438-2010** | **Laboratory Contact: Howard-Holmes** | **Carrier: Courier** 1 of 1 pages |
| 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 | | | |
| Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling | [X] 21 days | | |
| Portland, OR | [ ] Other _____ | | |
| Project #: 60566335 Study: Surface Sediment | | | |
| Sample Type: D/U | | | |

| Sample Identification | Sample Date | Sample Time | Matrix | QC Sample | Sampler's Initials | Total No. of Cont. | Fraction | ~~PCB Congeners 1668A~~ OC Pest | WQ - Pesticides 1669M | per AECOM | Sample Specific Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 PDI-SG-B458 | 7/2/2018 | 11:00 | SS | | AC | 1 | | H | | | |
| 2 PDI-SG-B470 | 7/2/2018 | 15:20 | SS | | AC | 1 | | H | | | |
| 3 PDI-SG-B469 | 7/2/2018 | 16:30 | SS | | AC | 1 | | H | | | |
| 4 PDI-SG-B456 | 7/2/2018 | 10:19 | SS | | SH | 1 | | H | | | |
| 5 PDI-SG-B462 | 7/2/2018 | 11:56 | SS | | SH | 1 | | H | | | |
| 6 PDI-SG-B463 | 7/2/2018 | 12:58 | SS | MS/MSD | SH | 3 | | H | | | |
| 7 PDI-SG-B464 | 7/2/2018 | 14:39 | SS | | SH | 1 | | H | | | |
| 8 PDI-SG-B466 | 7/2/2018 | 15:34 | SS | | SH | 1 | | H | | | |
| 9 PDI-SG-B468 | 7/2/2018 | 14:02 | SS | | SH | 1 | | H | | | |
| 10 PDI-SG-B429 | 7/3/2018 | 10:15 | SS | | SH | 1 | | H | | | |
| 11 RB-VV-180703-1720 | 7/3/2018 | 17:20 | W | | SH | 2 | | | 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:**

**H - Hold analyses pending further instruction.**

| Relinquished by | Company | Date/Time | Received by | Company | Date/Time |
|---|---|---|---|---|---|
| | AECOM | 7/5/18 1143 | | AW | 7/5/18 1143 |
| | AW | 7/5/18 1350 | | ALS | 7/5/18 1300 |
| | | | | | |

PC H2

# Cooler Receipt and Preservation Form

Client AECOM Service Request *K18* 06305

Received: 7/5/18 Opened: 7/5/18 By: [signature] Unloaded: 7/5/18 By: [signature]

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 | Fil |
|---|---|---|---|---|---|---|---|---|
| 2.0 | 2.0 | 5.8 | 5.8 | Ø | 386 | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

**ALS Environmental—Kelso Laboratory**
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**COLUMBIA ANALYTICAL SERVICES, INC.**
**Now part of the ALS Group**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 - 07/03/18 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/5/18 |
| **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-B458 | K1806305-001 | **51.3** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B470 | K1806305-002 | **50.3** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B469 | K1806305-003 | **49.4** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B456 | K1806305-004 | **58.6** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B462 | K1806305-005 | **54.3** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B463 | K1806305-006 | **60.6** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B464 | K1806305-007 | **50.4** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B466 | K1806305-008 | **54.6** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B468 | K1806305-009 | **62.3** | - | - | 1 | 07/06/18 09:20 | |
| PDI-SG-B429 | K1806305-010 | **50.3** | - | - | 1 | 07/06/18 09:20 | |

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Now part of the ALS Group**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 |
| | | **Date Analyzed:** | 07/06/18 |

## Replicate Sample Summary
## Inorganic Parameters

| | | | |
|---|---|---|---|
| **Sample Name:** | PDI-SG-B463 | **Units:** | Percent |
| **Lab Code:** | K1806305-006 | **Basis:** | As Received |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample K1806305-006DUP Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Solids, Total | 160.3 Modified | - | 60.6 | 60.7 | 60.7 | <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 | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 11:00 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B458 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-001 | **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 | **1.7** | | 0.36 | 0.23 | 1 | 09/13/18 16:06 | 8/29/18 | |
| 2,4'-DDE | **0.31** | **J** | 0.36 | 0.29 | 1 | 09/13/18 16:06 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.36 | 0.34 | 1 | 09/13/18 16:06 | 8/29/18 | |
| 4,4'-DDD | **7.9** | | 0.36 | 0.13 | 1 | 09/13/18 16:06 | 8/29/18 | |
| 4,4'-DDE | **3.6** | | 0.36 | 0.26 | 1 | 09/13/18 16:06 | 8/29/18 | |
| 4,4'-DDT | **0.29** | **J** | 0.36 | 0.17 | 1 | 09/13/18 16:06 | 8/29/18 | |
| Aldrin | ND | U | 0.36 | 0.29 | 1 | 09/13/18 16:06 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.72 | 0.23 | 1 | 09/13/18 16:06 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.36 | 0.36 | 1 | 09/13/18 16:06 | 8/29/18 | |
| Dieldrin | **0.32** | **J** | 0.72 | 0.28 | 1 | 09/13/18 16:06 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.36 | 0.12 | 1 | 09/13/18 16:06 | 8/29/18 | |
| gamma-Chlordane | **0.35** | **J** | 0.72 | 0.24 | 1 | 09/13/18 16:06 | 8/29/18 | |
| Heptachlor | ND | U | 0.36 | 0.15 | 1 | 09/13/18 16:06 | 8/29/18 | |
| Oxychlordane | ND | U | 0.72 | 0.47 | 1 | 09/13/18 16:06 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.72 | 0.21 | 1 | 09/13/18 16:06 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 93 | 5 - 120 | 09/13/18 16:06 | |
| S_4,4'-DDT-d4 | 107 | 13 - 200 | 09/13/18 16:06 | |
| S_Aldrin-13C12 | 53 | 10 - 143 | 09/13/18 16:06 | |
| S_Endrin-13C12 | 135 | 20 - 157 | 09/13/18 16:06 | |
| S_GBHCD6 | 41 | 5 - 124 | 09/13/18 16:06 | |
| S_Heptachlor-13C10 | 81 | 10 - 177 | 09/13/18 16:06 | |
| S_Heptachlrepox13C10 | 72 | 8 - 146 | 09/13/18 16:06 | |
| S_Oxychlordane-13C10 | 54 | 5 - 144 | 09/13/18 16:06 | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 15:20 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B470 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-002 | **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 | ND | U | 0.38 | 0.24 | 1 | 09/13/18 16:24 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.38 | 0.30 | 1 | 09/13/18 16:24 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.38 | 0.36 | 1 | 09/13/18 16:24 | 8/29/18 | |
| 4,4'-DDD | **0.46** | | 0.38 | 0.14 | 1 | 09/13/18 16:24 | 8/29/18 | |
| 4,4'-DDE | **0.58** | | 0.38 | 0.27 | 1 | 09/13/18 16:24 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.38 | 0.18 | 1 | 09/13/18 16:24 | 8/29/18 | |
| Aldrin | ND | U | 0.38 | 0.30 | 1 | 09/13/18 16:24 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.75 | 0.24 | 1 | 09/13/18 16:24 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.38 | 0.37 | 1 | 09/13/18 16:24 | 8/29/18 | |
| Dieldrin | ND | U | 0.75 | 0.30 | 1 | 09/13/18 16:24 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.38 | 0.12 | 1 | 09/13/18 16:24 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.75 | 0.25 | 1 | 09/13/18 16:24 | 8/29/18 | |
| Heptachlor | ND | U | 0.38 | 0.15 | 1 | 09/13/18 16:24 | 8/29/18 | |
| Oxychlordane | ND | U | 0.75 | 0.50 | 1 | 09/13/18 16:24 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.75 | 0.22 | 1 | 09/13/18 16:24 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 85 | 5 - 120 | 09/13/18 16:24 | |
| S_4,4'-DDT-d4 | 98 | 13 - 200 | 09/13/18 16:24 | |
| S_Aldrin-13C12 | 37 | 10 - 143 | 09/13/18 16:24 | |
| S_Endrin-13C12 | 109 | 20 - 157 | 09/13/18 16:24 | |
| S_GBHCD6 | 29 | 5 - 124 | 09/13/18 16:24 | |
| S_Heptachlor-13C10 | 73 | 10 - 177 | 09/13/18 16:24 | |
| S_Heptachlrepox13C10 | 52 | 8 - 146 | 09/13/18 16:24 | |
| S_Oxychlordane-13C10 | 39 | 5 - 144 | 09/13/18 16:24 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 16:30 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B469 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-003 | **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 | 09/13/18 16:41 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.39 | 0.31 | 1 | 09/13/18 16:41 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.39 | 0.37 | 1 | 09/13/18 16:41 | 8/29/18 | |
| 4,4'-DDD | **0.51** | | 0.39 | 0.14 | 1 | 09/13/18 16:41 | 8/29/18 | |
| 4,4'-DDE | **0.68** | | 0.39 | 0.28 | 1 | 09/13/18 16:41 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.39 | 0.19 | 1 | 09/13/18 16:41 | 8/29/18 | |
| Aldrin | ND | U | 0.39 | 0.31 | 1 | 09/13/18 16:41 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.78 | 0.25 | 1 | 09/13/18 16:41 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.39 | 0.38 | 1 | 09/13/18 16:41 | 8/29/18 | |
| Dieldrin | ND | U | 0.78 | 0.31 | 1 | 09/13/18 16:41 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.39 | 0.13 | 1 | 09/13/18 16:41 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.78 | 0.26 | 1 | 09/13/18 16:41 | 8/29/18 | |
| Heptachlor | ND | U | 0.39 | 0.16 | 1 | 09/13/18 16:41 | 8/29/18 | |
| Oxychlordane | ND | U | 0.78 | 0.51 | 1 | 09/13/18 16:41 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.78 | 0.23 | 1 | 09/13/18 16:41 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 86 | 5 - 120 | 09/13/18 16:41 | |
| S_4,4'-DDT-d4 | 117 | 13 - 200 | 09/13/18 16:41 | |
| S_Aldrin-13C12 | 42 | 10 - 143 | 09/13/18 16:41 | |
| S_Endrin-13C12 | 122 | 20 - 157 | 09/13/18 16:41 | |
| S_GBHCD6 | 31 | 5 - 124 | 09/13/18 16:41 | |
| S_Heptachlor-13C10 | 73 | 10 - 177 | 09/13/18 16:41 | |
| S_Heptachlrepox13C10 | 55 | 8 - 146 | 09/13/18 16:41 | |
| S_Oxychlordane-13C10 | 43 | 5 - 144 | 09/13/18 16:41 | |

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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 10:19 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B456 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-004 | **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 | 0.33 | 0.21 | 1 | 09/13/18 16:59 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.33 | 0.26 | 1 | 09/13/18 16:59 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.33 | 0.31 | 1 | 09/13/18 16:59 | 8/29/18 | |
| 4,4'-DDD | **0.31** | **J** | 0.33 | 0.12 | 1 | 09/13/18 16:59 | 8/29/18 | |
| 4,4'-DDE | **0.38** | | 0.33 | 0.24 | 1 | 09/13/18 16:59 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.33 | 0.16 | 1 | 09/13/18 16:59 | 8/29/18 | |
| Aldrin | ND | U | 0.33 | 0.26 | 1 | 09/13/18 16:59 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.66 | 0.21 | 1 | 09/13/18 16:59 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.33 | 0.32 | 1 | 09/13/18 16:59 | 8/29/18 | |
| Dieldrin | ND | U | 0.66 | 0.26 | 1 | 09/13/18 16:59 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.33 | 0.11 | 1 | 09/13/18 16:59 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.66 | 0.22 | 1 | 09/13/18 16:59 | 8/29/18 | |
| Heptachlor | ND | U | 0.33 | 0.13 | 1 | 09/13/18 16:59 | 8/29/18 | |
| Oxychlordane | ND | U | 0.66 | 0.43 | 1 | 09/13/18 16:59 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.66 | 0.20 | 1 | 09/13/18 16:59 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 95 | 5 - 120 | 09/13/18 16:59 | |
| S_4,4'-DDT-d4 | 129 | 13 - 200 | 09/13/18 16:59 | |
| S_Aldrin-13C12 | 48 | 10 - 143 | 09/13/18 16:59 | |
| S_Endrin-13C12 | 130 | 20 - 157 | 09/13/18 16:59 | |
| S_GBHCD6 | 37 | 5 - 124 | 09/13/18 16:59 | |
| S_Heptachlor-13C10 | 83 | 10 - 177 | 09/13/18 16:59 | |
| S_Heptachlrepox13C10 | 65 | 8 - 146 | 09/13/18 16:59 | |
| S_Oxychlordane-13C10 | 50 | 5 - 144 | 09/13/18 16:59 | |

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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 11:56 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B462 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-005 | **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 | 0.35 | 0.23 | 1 | 09/13/18 17:16 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.35 | 0.28 | 1 | 09/13/18 17:16 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.35 | 0.34 | 1 | 09/13/18 17:16 | 8/29/18 | |
| 4,4'-DDD | **0.48** | | 0.35 | 0.13 | 1 | 09/13/18 17:16 | 8/29/18 | |
| 4,4'-DDE | **0.74** | | 0.35 | 0.25 | 1 | 09/13/18 17:16 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.35 | 0.17 | 1 | 09/13/18 17:16 | 8/29/18 | |
| Aldrin | ND | U | 0.35 | 0.28 | 1 | 09/13/18 17:16 | 8/29/18 | |
| alpha-Chlordane | **0.56** | **J** | 0.71 | 0.22 | 1 | 09/13/18 17:16 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.35 | 0.35 | 1 | 09/13/18 17:16 | 8/29/18 | |
| Dieldrin | ND | U | 0.71 | 0.28 | 1 | 09/13/18 17:16 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.35 | 0.11 | 1 | 09/13/18 17:16 | 8/29/18 | |
| gamma-Chlordane | **0.59** | **J** | 0.71 | 0.23 | 1 | 09/13/18 17:16 | 8/29/18 | |
| Heptachlor | ND | U | 0.35 | 0.14 | 1 | 09/13/18 17:16 | 8/29/18 | |
| Oxychlordane | ND | U | 0.71 | 0.46 | 1 | 09/13/18 17:16 | 8/29/18 | |
| trans-Nonachlor | **0.75** | | 0.71 | 0.21 | 1 | 09/13/18 17:16 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 101 | 5 - 120 | 09/13/18 17:16 | |
| S_4,4'-DDT-d4 | 131 | 13 - 200 | 09/13/18 17:16 | |
| S_Aldrin-13C12 | 51 | 10 - 143 | 09/13/18 17:16 | |
| S_Endrin-13C12 | 140 | 20 - 157 | 09/13/18 17:16 | |
| S_GBHCD6 | 43 | 5 - 124 | 09/13/18 17:16 | |
| S_Heptachlor-13C10 | 87 | 10 - 177 | 09/13/18 17:16 | |
| S_Heptachlrepox13C10 | 69 | 8 - 146 | 09/13/18 17:16 | |
| S_Oxychlordane-13C10 | 54 | 5 - 144 | 09/13/18 17:16 | |

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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 12:58 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B463 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-006 | **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 | 0.31 | 0.20 | 1 | 09/13/18 17:34 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.31 | 0.25 | 1 | 09/13/18 17:34 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.31 | 0.30 | 1 | 09/13/18 17:34 | 8/29/18 | |
| 4,4'-DDD | **0.60** | | 0.31 | 0.11 | 1 | 09/13/18 17:34 | 8/29/18 | |
| 4,4'-DDE | **0.46** | | 0.31 | 0.22 | 1 | 09/13/18 17:34 | 8/29/18 | |
| 4,4'-DDT | **4.9** | | 0.31 | 0.15 | 1 | 09/13/18 17:34 | 8/29/18 | |
| Aldrin | ND | U | 0.31 | 0.25 | 1 | 09/13/18 17:34 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.63 | 0.20 | 1 | 09/13/18 17:34 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.31 | 0.31 | 1 | 09/13/18 17:34 | 8/29/18 | |
| Dieldrin | ND | U | 0.63 | 0.25 | 1 | 09/13/18 17:34 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.31 | 0.098 | 1 | 09/13/18 17:34 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.63 | 0.21 | 1 | 09/13/18 17:34 | 8/29/18 | |
| Heptachlor | ND | U | 0.31 | 0.13 | 1 | 09/13/18 17:34 | 8/29/18 | |
| Oxychlordane | ND | U | 0.63 | 0.41 | 1 | 09/13/18 17:34 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.63 | 0.19 | 1 | 09/13/18 17:34 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 67 | 5 - 120 | 09/13/18 17:34 | |
| S_4,4'-DDT-d4 | 86 | 13 - 200 | 09/13/18 17:34 | |
| S_Aldrin-13C12 | 32 | 10 - 143 | 09/13/18 17:34 | |
| S_Endrin-13C12 | 87 | 20 - 157 | 09/13/18 17:34 | |
| S_GBHCD6 | 25 | 5 - 124 | 09/13/18 17:34 | |
| S_Heptachlor-13C10 | 52 | 10 - 177 | 09/13/18 17:34 | |
| S_Heptachlrepox13C10 | 42 | 8 - 146 | 09/13/18 17:34 | |
| S_Oxychlordane-13C10 | 34 | 5 - 144 | 09/13/18 17:34 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 14:39 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B464 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-007 | **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 | 0.38 | 0.24 | 1 | 09/13/18 17:52 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.38 | 0.30 | 1 | 09/13/18 17:52 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.38 | 0.36 | 1 | 09/13/18 17:52 | 8/29/18 | |
| 4,4'-DDD | **0.64** | | 0.38 | 0.14 | 1 | 09/13/18 17:52 | 8/29/18 | |
| 4,4'-DDE | **0.90** | | 0.38 | 0.27 | 1 | 09/13/18 17:52 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.38 | 0.18 | 1 | 09/13/18 17:52 | 8/29/18 | |
| Aldrin | ND | U | 0.38 | 0.30 | 1 | 09/13/18 17:52 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.75 | 0.24 | 1 | 09/13/18 17:52 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.38 | 0.37 | 1 | 09/13/18 17:52 | 8/29/18 | |
| Dieldrin | ND | U | 0.75 | 0.29 | 1 | 09/13/18 17:52 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.38 | 0.12 | 1 | 09/13/18 17:52 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.75 | 0.25 | 1 | 09/13/18 17:52 | 8/29/18 | |
| Heptachlor | ND | U | 0.38 | 0.15 | 1 | 09/13/18 17:52 | 8/29/18 | |
| Oxychlordane | ND | U | 0.75 | 0.49 | 1 | 09/13/18 17:52 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.75 | 0.22 | 1 | 09/13/18 17:52 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 86 | 5 - 120 | 09/13/18 17:52 | |
| S_4,4'-DDT-d4 | 118 | 13 - 200 | 09/13/18 17:52 | |
| S_Aldrin-13C12 | 44 | 10 - 143 | 09/13/18 17:52 | |
| S_Endrin-13C12 | 125 | 20 - 157 | 09/13/18 17:52 | |
| S_GBHCD6 | 34 | 5 - 124 | 09/13/18 17:52 | |
| S_Heptachlor-13C10 | 78 | 10 - 177 | 09/13/18 17:52 | |
| S_Heptachlrepox13C10 | 58 | 8 - 146 | 09/13/18 17:52 | |
| S_Oxychlordane-13C10 | 47 | 5 - 144 | 09/13/18 17:52 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 15:34 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B466 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-008 | **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 | 0.35 | 0.23 | 1 | 09/13/18 18:09 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.35 | 0.28 | 1 | 09/13/18 18:09 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.35 | 0.33 | 1 | 09/13/18 18:09 | 8/29/18 | |
| 4,4'-DDD | **0.33** | **J** | 0.35 | 0.13 | 1 | 09/13/18 18:09 | 8/29/18 | |
| 4,4'-DDE | **0.49** | | 0.35 | 0.25 | 1 | 09/13/18 18:09 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.35 | 0.17 | 1 | 09/13/18 18:09 | 8/29/18 | |
| Aldrin | ND | U | 0.35 | 0.28 | 1 | 09/13/18 18:09 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.70 | 0.22 | 1 | 09/13/18 18:09 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.35 | 0.34 | 1 | 09/13/18 18:09 | 8/29/18 | |
| Dieldrin | ND | U | 0.70 | 0.27 | 1 | 09/13/18 18:09 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.35 | 0.11 | 1 | 09/13/18 18:09 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.70 | 0.23 | 1 | 09/13/18 18:09 | 8/29/18 | |
| Heptachlor | ND | U | 0.35 | 0.14 | 1 | 09/13/18 18:09 | 8/29/18 | |
| Oxychlordane | ND | U | 0.70 | 0.46 | 1 | 09/13/18 18:09 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.70 | 0.21 | 1 | 09/13/18 18:09 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 99 | 5 - 120 | 09/13/18 18:09 | |
| S_4,4'-DDT-d4 | 129 | 13 - 200 | 09/13/18 18:09 | |
| S_Aldrin-13C12 | 49 | 10 - 143 | 09/13/18 18:09 | |
| S_Endrin-13C12 | 140 | 20 - 157 | 09/13/18 18:09 | |
| S_GBHCD6 | 38 | 5 - 124 | 09/13/18 18:09 | |
| S_Heptachlor-13C10 | 92 | 10 - 177 | 09/13/18 18:09 | |
| S_Heptachlrepox13C10 | 70 | 8 - 146 | 09/13/18 18:09 | |
| S_Oxychlordane-13C10 | 49 | 5 - 144 | 09/13/18 18:09 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 14:02 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B468 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-009 | **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 | 0.30 | 0.20 | 1 | 09/13/18 18:27 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.30 | 0.24 | 1 | 09/13/18 18:27 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.30 | 0.29 | 1 | 09/13/18 18:27 | 8/29/18 | |
| 4,4'-DDD | **0.17** | **J** | 0.30 | 0.11 | 1 | 09/13/18 18:27 | 8/29/18 | |
| 4,4'-DDE | **0.25** | **J** | 0.30 | 0.22 | 1 | 09/13/18 18:27 | 8/29/18 | |
| 4,4'-DDT | ND | U | 0.30 | 0.15 | 1 | 09/13/18 18:27 | 8/29/18 | |
| Aldrin | ND | U | 0.30 | 0.24 | 1 | 09/13/18 18:27 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.60 | 0.19 | 1 | 09/13/18 18:27 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.30 | 0.30 | 1 | 09/13/18 18:27 | 8/29/18 | |
| Dieldrin | ND | U | 0.60 | 0.24 | 1 | 09/13/18 18:27 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.30 | 0.094 | 1 | 09/13/18 18:27 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.60 | 0.20 | 1 | 09/13/18 18:27 | 8/29/18 | |
| Heptachlor | ND | U | 0.30 | 0.12 | 1 | 09/13/18 18:27 | 8/29/18 | |
| Oxychlordane | ND | U | 0.60 | 0.40 | 1 | 09/13/18 18:27 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.60 | 0.18 | 1 | 09/13/18 18:27 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 92 | 5 - 120 | 09/13/18 18:27 | |
| S_4,4'-DDT-d4 | 119 | 13 - 200 | 09/13/18 18:27 | |
| S_Aldrin-13C12 | 44 | 10 - 143 | 09/13/18 18:27 | |
| S_Endrin-13C12 | 120 | 20 - 157 | 09/13/18 18:27 | |
| S_GBHCD6 | 35 | 5 - 124 | 09/13/18 18:27 | |
| S_Heptachlor-13C10 | 74 | 10 - 177 | 09/13/18 18:27 | |
| S_Heptachlrepox13C10 | 59 | 8 - 146 | 09/13/18 18:27 | |
| S_Oxychlordane-13C10 | 46 | 5 - 144 | 09/13/18 18:27 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/03/18 10:15 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | PDI-SG-B429 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-010 | **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 | 0.37 | 0.24 | 1 | 09/13/18 18:44 | 8/29/18 | |
| 2,4'-DDE | ND | U | 0.37 | 0.30 | 1 | 09/13/18 18:44 | 8/29/18 | |
| 2,4'-DDT | ND | U | 0.37 | 0.36 | 1 | 09/13/18 18:44 | 8/29/18 | |
| 4,4'-DDD | **0.55** | | 0.37 | 0.14 | 1 | 09/13/18 18:44 | 8/29/18 | |
| 4,4'-DDE | **0.75** | | 0.37 | 0.27 | 1 | 09/13/18 18:44 | 8/29/18 | |
| 4,4'-DDT | **0.18** | **J** | 0.37 | 0.18 | 1 | 09/13/18 18:44 | 8/29/18 | |
| Aldrin | ND | U | 0.37 | 0.30 | 1 | 09/13/18 18:44 | 8/29/18 | |
| alpha-Chlordane | ND | U | 0.75 | 0.24 | 1 | 09/13/18 18:44 | 8/29/18 | |
| cis-Nonachlor | ND | U | 0.37 | 0.37 | 1 | 09/13/18 18:44 | 8/29/18 | |
| Dieldrin | ND | U | 0.75 | 0.29 | 1 | 09/13/18 18:44 | 8/29/18 | |
| gamma-BHC (Lindane) | ND | U | 0.37 | 0.12 | 1 | 09/13/18 18:44 | 8/29/18 | |
| gamma-Chlordane | ND | U | 0.75 | 0.24 | 1 | 09/13/18 18:44 | 8/29/18 | |
| Heptachlor | ND | U | 0.37 | 0.15 | 1 | 09/13/18 18:44 | 8/29/18 | |
| Oxychlordane | ND | U | 0.75 | 0.49 | 1 | 09/13/18 18:44 | 8/29/18 | |
| trans-Nonachlor | ND | U | 0.75 | 0.22 | 1 | 09/13/18 18:44 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 100 | 5 - 120 | 09/13/18 18:44 | |
| S_4,4'-DDT-d4 | 128 | 13 - 200 | 09/13/18 18:44 | |
| S_Aldrin-13C12 | 50 | 10 - 143 | 09/13/18 18:44 | |
| S_Endrin-13C12 | 136 | 20 - 157 | 09/13/18 18:44 | |
| S_GBHCD6 | 39 | 5 - 124 | 09/13/18 18:44 | |
| S_Heptachlor-13C10 | 94 | 10 - 177 | 09/13/18 18:44 | |
| S_Heptachlrepox13C10 | 67 | 8 - 146 | 09/13/18 18:44 | |
| S_Oxychlordane-13C10 | 52 | 5 - 144 | 09/13/18 18:44 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/03/18 17:20 |
| **Sample Matrix:** | Water | **Date Received:** | 07/05/18 13:00 |
| **Sample Name:** | RB-VV-180703-1720 | **Units:** | ng/L |
| **Lab Code:** | K1806305-011 | **Basis:** | NA |

## Organochlorine Pesticides by GC/MS/MS

**Analysis Method:** ALS SOP
**Prep Method:** EPA 3535A

| Analyte Name | Result | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|
| 2,4'-DDD | ND U | 0.51 | 0.12 | 1 | 07/19/18 02:22 | 7/6/18 | |
| 2,4'-DDE | ND U | 0.51 | 0.12 | 1 | 07/19/18 02:22 | 7/6/18 | * |
| 2,4'-DDT | ND U | 0.51 | 0.089 | 1 | 07/19/18 02:22 | 7/6/18 | |
| 4,4'-DDD | ND U | 0.51 | 0.11 | 1 | 07/19/18 02:22 | 7/6/18 | |
| 4,4'-DDE | ND U | 0.51 | 0.077 | 1 | 07/19/18 02:22 | 7/6/18 | * |
| 4,4'-DDT | ND U | 0.51 | 0.090 | 1 | 07/19/18 02:22 | 7/6/18 | * |
| Aldrin | ND U | 1.0 | 0.47 | 1 | 07/19/18 02:22 | 7/6/18 | |
| alpha-Chlordane | ND U | 0.51 | 0.14 | 1 | 07/19/18 02:22 | 7/6/18 | |
| cis-Nonachlor | ND U | 0.51 | 0.18 | 1 | 07/19/18 02:22 | 7/6/18 | * |
| Dieldrin | ND U | 5.1 | 0.76 | 1 | 07/19/18 02:22 | 7/6/18 | |
| gamma-BHC (Lindane) | ND U | 0.51 | 0.31 | 1 | 07/19/18 02:22 | 7/6/18 | |
| gamma-Chlordane | ND U | 0.51 | 0.18 | 1 | 07/19/18 02:22 | 7/6/18 | |
| Heptachlor | ND U | 1.0 | 0.13 | 1 | 07/19/18 02:22 | 7/6/18 | |
| Oxychlordane | ND U | 5.1 | 2.1 | 1 | 07/19/18 02:22 | 7/6/18 | |
| trans-Nonachlor | ND U | 0.51 | 0.13 | 1 | 07/19/18 02:22 | 7/6/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 111 | 5 - 120 | 07/19/18 02:22 | |
| S_4,4'-DDT-d4 | 92 | 13 - 200 | 07/19/18 02:22 | |
| S_Aldrin-13C12 | 42 | 5 - 126 | 07/19/18 02:22 | |
| S_Endrin-13C12 | 68 | 20 - 157 | 07/19/18 02:22 | |
| S_GBHCD6 | 36 | 5 - 124 | 07/19/18 02:22 | |
| S_Heptachlor-13C10 | 56 | 5 - 128 | 07/19/18 02:22 | |
| S_Heptachlrepox13C10 | 42 | 8 - 146 | 07/19/18 02:22 | |
| S_Oxychlordane-13C10 | 48 | 5 - 144 | 07/19/18 02:22 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | ng/L |
| **Lab Code:** | KQ1809076-03 | **Basis:** | NA |

## Organochlorine Pesticides by GC/MS/MS

**Analysis Method:** ALS SOP
**Prep Method:** EPA 3535A

| Analyte Name | Result | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|
| 2,4'-DDD | ND U | 0.50 | 0.11 | 1 | 07/19/18 00:58 | 7/6/18 | |
| 2,4'-DDE | ND U | 0.50 | 0.11 | 1 | 07/19/18 00:58 | 7/6/18 | |
| 2,4'-DDT | ND U | 0.50 | 0.087 | 1 | 07/19/18 00:58 | 7/6/18 | |
| 4,4'-DDD | ND U | 0.50 | 0.10 | 1 | 07/19/18 00:58 | 7/6/18 | |
| 4,4'-DDE | ND U | 0.50 | 0.075 | 1 | 07/19/18 00:58 | 7/6/18 | |
| 4,4'-DDT | ND U | 0.50 | 0.088 | 1 | 07/19/18 00:58 | 7/6/18 | |
| Aldrin | ND U | 1.0 | 0.46 | 1 | 07/19/18 00:58 | 7/6/18 | |
| alpha-Chlordane | ND U | 0.50 | 0.13 | 1 | 07/19/18 00:58 | 7/6/18 | |
| cis-Nonachlor | ND U | 0.50 | 0.17 | 1 | 07/19/18 00:58 | 7/6/18 | |
| Dieldrin | ND U | 5.0 | 0.74 | 1 | 07/19/18 00:58 | 7/6/18 | |
| gamma-BHC (Lindane) | ND U | 0.50 | 0.30 | 1 | 07/19/18 00:58 | 7/6/18 | |
| gamma-Chlordane | ND U | 0.50 | 0.17 | 1 | 07/19/18 00:58 | 7/6/18 | |
| Heptachlor | ND U | 1.0 | 0.12 | 1 | 07/19/18 00:58 | 7/6/18 | |
| Oxychlordane | ND U | 5.0 | 2.0 | 1 | 07/19/18 00:58 | 7/6/18 | |
| trans-Nonachlor | ND U | 0.50 | 0.12 | 1 | 07/19/18 00:58 | 7/6/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 132 | 5 - 120 | 07/19/18 00:58 | * |
| S_4,4'-DDT-d4 | 122 | 13 - 200 | 07/19/18 00:58 | |
| S_Aldrin-13C12 | 44 | 5 - 126 | 07/19/18 00:58 | |
| S_Endrin-13C12 | 72 | 20 - 157 | 07/19/18 00:58 | |
| S_GBHCD6 | 41 | 5 - 124 | 07/19/18 00:58 | |
| S_Heptachlor-13C10 | 67 | 5 - 128 | 07/19/18 00:58 | |
| S_Heptachlrepox13C10 | 51 | 8 - 146 | 07/19/18 00:58 | |
| S_Oxychlordane-13C10 | 54 | 5 - 144 | 07/19/18 00:58 | |

**ALS Group USA, Corp.**
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Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **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:** | KQ1811916-04 | **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 | 0.10 | 0.063 | 1 | 09/13/18 14:20 | 8/29/18 | |
| 2,4'-DDE | ND U | 0.10 | 0.079 | 1 | 09/13/18 14:20 | 8/29/18 | |
| 2,4'-DDT | ND U | 0.10 | 0.094 | 1 | 09/13/18 14:20 | 8/29/18 | |
| 4,4'-DDD | ND U | 0.10 | 0.035 | 1 | 09/13/18 14:20 | 8/29/18 | |
| 4,4'-DDE | ND U | 0.10 | 0.070 | 1 | 09/13/18 14:20 | 8/29/18 | |
| 4,4'-DDT | ND U | 0.10 | 0.047 | 1 | 09/13/18 14:20 | 8/29/18 | |
| Aldrin | ND U | 0.10 | 0.079 | 1 | 09/13/18 14:20 | 8/29/18 | |
| alpha-Chlordane | ND U | 0.20 | 0.062 | 1 | 09/13/18 14:20 | 8/29/18 | |
| cis-Nonachlor | ND U | 0.10 | 0.097 | 1 | 09/13/18 14:20 | 8/29/18 | |
| Dieldrin | ND U | 0.20 | 0.077 | 1 | 09/13/18 14:20 | 8/29/18 | |
| gamma-BHC (Lindane) | ND U | 0.10 | 0.031 | 1 | 09/13/18 14:20 | 8/29/18 | |
| gamma-Chlordane | ND U | 0.20 | 0.064 | 1 | 09/13/18 14:20 | 8/29/18 | |
| Heptachlor | ND U | 0.10 | 0.039 | 1 | 09/13/18 14:20 | 8/29/18 | |
| Oxychlordane | ND U | 0.20 | 0.13 | 1 | 09/13/18 14:20 | 8/29/18 | |
| trans-Nonachlor | ND U | 0.20 | 0.058 | 1 | 09/13/18 14:20 | 8/29/18 | |

| Surrogate Name | % Rec | Control Limits | Date Analyzed | Q |
|---|---|---|---|---|
| S_4,4'DDD-d4 | 49 | 5 - 120 | 09/13/18 14:20 | |
| S_4,4'-DDT-d4 | 52 | 13 - 200 | 09/13/18 14:20 | |
| S_Aldrin-13C12 | 56 | 10 - 143 | 09/13/18 14:20 | |
| S_Endrin-13C12 | 57 | 20 - 157 | 09/13/18 14:20 | |
| S_GBHCD6 | 35 | 5 - 124 | 09/13/18 14:20 | |
| S_Heptachlor-13C10 | 41 | 10 - 177 | 09/13/18 14:20 | |
| S_Heptachlrepox13C10 | 41 | 8 - 146 | 09/13/18 14:20 | |
| S_Oxychlordane-13C10 | 41 | 5 - 144 | 09/13/18 14:20 | |

**Client:** AECOM **Service Request:** K1806305
**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 |
|---|---|---|---|---|
| PDI-SG-B458 | K1806305-001 | 93 | 107 | 53 |
| PDI-SG-B470 | K1806305-002 | 85 | 98 | 37 |
| PDI-SG-B469 | K1806305-003 | 86 | 117 | 42 |
| PDI-SG-B456 | K1806305-004 | 95 | 129 | 48 |
| PDI-SG-B462 | K1806305-005 | 101 | 131 | 51 |
| PDI-SG-B463 | K1806305-006 | 67 | 86 | 32 |
| PDI-SG-B464 | K1806305-007 | 86 | 118 | 44 |
| PDI-SG-B466 | K1806305-008 | 99 | 129 | 49 |
| PDI-SG-B468 | K1806305-009 | 92 | 119 | 44 |
| PDI-SG-B429 | K1806305-010 | 100 | 128 | 50 |
| Method Blank | KQ1811916-04 | 49 | 52 | 56 |
| Lab Control Sample | KQ1811916-03 | 73 | 72 | 59 |
| PDI-SG-B463 | KQ1811916-01 | 74 | 82 | 56 |
| PDI-SG-B463 | KQ1811916-02 | 84 | 98 | 53 |

**Client:** AECOM **Service Request:** K1806305
**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 |
|---|---|---|---|---|
| PDI-SG-B458 | K1806305-001 | 135 | 41 | 81 |
| PDI-SG-B470 | K1806305-002 | 109 | 29 | 73 |
| PDI-SG-B469 | K1806305-003 | 122 | 31 | 73 |
| PDI-SG-B456 | K1806305-004 | 130 | 37 | 83 |
| PDI-SG-B462 | K1806305-005 | 140 | 43 | 87 |
| PDI-SG-B463 | K1806305-006 | 87 | 25 | 52 |
| PDI-SG-B464 | K1806305-007 | 125 | 34 | 78 |
| PDI-SG-B466 | K1806305-008 | 140 | 38 | 92 |
| PDI-SG-B468 | K1806305-009 | 120 | 35 | 74 |
| PDI-SG-B429 | K1806305-010 | 136 | 39 | 94 |
| Method Blank | KQ1811916-04 | 57 | 35 | 41 |
| Lab Control Sample | KQ1811916-03 | 82 | 46 | 53 |
| PDI-SG-B463 | KQ1811916-01 | 90 | 40 | 55 |
| PDI-SG-B463 | KQ1811916-02 | 109 | 39 | 64 |

**Client:** AECOM **Service Request:** K1806305
**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 |
|---|---|---|---|
| PDI-SG-B458 | K1806305-001 | 72 | 54 |
| PDI-SG-B470 | K1806305-002 | 52 | 39 |
| PDI-SG-B469 | K1806305-003 | 55 | 43 |
| PDI-SG-B456 | K1806305-004 | 65 | 50 |
| PDI-SG-B462 | K1806305-005 | 69 | 54 |
| PDI-SG-B463 | K1806305-006 | 42 | 34 |
| PDI-SG-B464 | K1806305-007 | 58 | 47 |
| PDI-SG-B466 | K1806305-008 | 70 | 49 |
| PDI-SG-B468 | K1806305-009 | 59 | 46 |
| PDI-SG-B429 | K1806305-010 | 67 | 52 |
| Method Blank | KQ1811916-04 | 41 | 41 |
| Lab Control Sample | KQ1811916-03 | 69 | 57 |
| PDI-SG-B463 | KQ1811916-01 | 58 | 50 |
| PDI-SG-B463 | KQ1811916-02 | 57 | 49 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335
**Sample Matrix:** Water

## 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 |
|---|---|---|---|---|
| RB-VV-180703-1720 | K1806305-011 | 111 | 92 | 42 |
| Method Blank | KQ1809076-03 | 132* | 122 | 44 |
| Lab Control Sample | KQ1809076-01 | 131* | 120 | 40 |
| Duplicate Lab Control Sample | KQ1809076-02 | 132* | 118 | 43 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335
**Sample Matrix:** Water

## 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 |
|---|---|---|---|---|
| RB-VV-180703-1720 | K1806305-011 | 68 | 36 | 56 |
| Method Blank | KQ1809076-03 | 72 | 41 | 67 |
| Lab Control Sample | KQ1809076-01 | 68 | 41 | 62 |
| Duplicate Lab Control Sample | KQ1809076-02 | 71 | 42 | 66 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335
**Sample Matrix:** Water

## 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 |
|---|---|---|---|
| RB-VV-180703-1720 | K1806305-011 | 42 | 48 |
| Method Blank | KQ1809076-03 | 51 | 54 |
| Lab Control Sample | KQ1809076-01 | 43 | 53 |
| Duplicate Lab Control Sample | KQ1809076-02 | 41 | 55 |

**Client:** AECOM **Service Request:**K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:**07/18/18 18:57

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

**File ID:** J:\MS21\Data\071818\071818F025.D\ **Lab Code:**KQ1809714-01
**Instrument ID:** K-MSMS-01 **Analysis Lot:**599147
**Analysis Method:** ALS SOP **Signal ID:**1

| | Pyrene-d10 | |
|---|---|---|
| | **Area** | **RT** |
| **Result ==>** | 18,349 | 14.6139 |
| **Upper Limit ==>** | 36,697 | 15.11 |
| **Lower Limit ==>** | 9,174 | 14.11 |

***Associated Analyses***

| | | | |
|---|---|---|---|
| Method Blank | KQ1809076-03 | 13537.1 | 14.614 |
| Lab Control Sample | KQ1809076-01 | 15459.8 | 14.6142 |
| Duplicate Lab Control Sample | KQ1809076-02 | 14639.9 | 14.6139 |
| RB-VV-180703-1720 | K1806305-011 | 14616.5 | 14.6139 |

**Client:** AECOM **Service Request:**K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:**09/13/18 13:55

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

**File ID:** Y:\MS42\data\091318\091318F004.D **Lab Code:**KQ1812946-01
**Instrument ID:** K-MS-42 **Analysis Lot:**606987
**Analysis Method:** ALS SOP **Signal ID:**1

| | | Pyrene-d10 | |
|---|---|---|---|
| | | **Area** | **RT** |
| | **Result ==>** | 10,438,834 | 9.824 |
| | **Upper Limit ==>** | 20,877,667 | 10.32 |
| | **Lower Limit ==>** | 5,219,417 | 9.32 |
| ***Associated Analyses*** | | | |
| Method Blank | KQ1811916-04 | 16837835.69 | 9.824 |
| Lab Control Sample | KQ1811916-03 | 23113187.26* | 9.813 |
| PDI-SG-B463MS | KQ1811916-01 | 30987362.61* | 9.819 |
| PDI-SG-B463DMS | KQ1811916-02 | 36275894.53* | 9.813 |
| PDI-SG-B458 | K1806305-001 | 47337287.09* | 9.819 |
| PDI-SG-B470 | K1806305-002 | 50896288.43* | 9.819 |
| PDI-SG-B469 | K1806305-003 | 52103672.08* | 9.813 |
| PDI-SG-B456 | K1806305-004 | 49042365.23* | 9.813 |
| PDI-SG-B462 | K1806305-005 | 47747690.23* | 9.813 |
| PDI-SG-B463 | K1806305-006 | 48974849.62* | 9.806 |
| PDI-SG-B464 | K1806305-007 | 48984354.28* | 9.813 |
| PDI-SG-B466 | K1806305-008 | 54620098.5* | 9.813 |
| PDI-SG-B468 | K1806305-009 | 46097744.14* | 9.813 |
| PDI-SG-B429 | K1806305-010 | 42189093.95* | 9.813 |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Collected:** | 07/02/18 |
| **Sample Matrix:** | Sediment | **Date Received:** | 07/05/18 |
| | | **Date Analyzed:** | 09/13/18 |
| | | **Date Extracted:** | 08/29/18 |

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

| | | | |
|---|---|---|---|
| **Sample Name:** | PDI-SG-B463 | **Units:** | ug/Kg |
| **Lab Code:** | K1806305-006 | **Basis:** | Dry |
| **Analysis Method:** | ALS SOP | | |
| **Prep Method:** | EPA 3541 | | |

| | | **Matrix Spike** KQ1811916-01 | | | **Duplicate Matrix Spike** KQ1811916-02 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Sample Result** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| 2,4'-DDD | ND U | 6.38 | 6.28 | 102 | 5.79 | 6.15 | 94 | 32-169 | 10 | 40 |
| 2,4'-DDE | ND U | 5.15 | 6.28 | 82 | 4.33 | 6.15 | 70 | 43-155 | 17 | 40 |
| 2,4'-DDT | ND U | 4.89 | 6.28 | 78 | 4.44 | 6.15 | 72 | 55-161 | 10 | 40 |
| 4,4'-DDD | 0.60 | 6.08 | 6.28 | 87 | 5.65 | 6.15 | 82 | 10-190 | 7 | 40 |
| 4,4'-DDE | 0.46 | 6.30 | 6.28 | 93 | 4.91 | 6.15 | 72 | 35-162 | 25 | 40 |
| 4,4'-DDT | 4.9 | 5.84 | 6.28 | 15 * | 5.45 | 6.15 | 9 * | 24-183 | 7 | 40 |
| Aldrin | ND U | 6.47 | 6.28 | 103 | 5.94 | 6.15 | 97 | 52-151 | 8 | 40 |
| alpha-Chlordane | ND U | 6.18 | 6.28 | 98 | 6.13 | 6.15 | 100 | 31-156 | <1 | 40 |
| cis-Nonachlor | ND U | 5.39 | 6.28 | 86 | 5.56 | 6.15 | 90 | 27-144 | 3 | 40 |
| Dieldrin | ND U | 4.91 | 6.28 | 78 | 3.99 | 6.15 | 65 | 28-150 | 21 | 40 |
| gamma-BHC (Lindane) | ND U | 5.35 | 6.28 | 85 | 4.78 | 6.15 | 78 | 64-135 | 11 | 40 |
| gamma-Chlordane | ND U | 6.70 | 6.28 | 107 | 6.02 | 6.15 | 98 | 31-158 | 11 | 40 |
| Heptachlor | ND U | 6.30 | 6.28 | 100 | 5.87 | 6.15 | 95 | 76-117 | 7 | 40 |
| Oxychlordane | ND U | 5.76 | 6.28 | 92 | 5.60 | 6.15 | 91 | 53-144 | 3 | 40 |
| trans-Nonachlor | ND U | 5.60 | 6.28 | 89 | 5.20 | 6.15 | 85 | 35-153 | 7 | 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 | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 09/13/18 |
| **Sample Matrix:** | Sediment | **Date Extracted:** | 08/29/18 |

## 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:** | 606987 |

**Lab Control Sample**
**KQ1811916-03**

| Analyte Name | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|
| 2,4'-DDD | 2.29 | 2.00 | 115 | 73-122 |
| 2,4'-DDE | 1.68 | 2.00 | 84 | 54-145 |
| 2,4'-DDT | 1.78 | 2.00 | 89 | 77-118 |
| 4,4'-DDD | 1.92 | 2.00 | 96 | 74-117 |
| 4,4'-DDE | 1.80 | 2.00 | 90 | 66-132 |
| 4,4'-DDT | 1.82 | 2.00 | 91 | 78-116 |
| Aldrin | 2.09 | 2.00 | 105 | 74-122 |
| alpha-Chlordane | 1.85 | 2.00 | 93 | 74-130 |
| cis-Nonachlor | 1.82 | 2.00 | 91 | 69-134 |
| Dieldrin | 1.80 | 2.00 | 90 | 62-131 |
| gamma-BHC (Lindane) | 1.66 | 2.00 | 83 | 79-116 |
| gamma-Chlordane | 2.19 | 2.00 | 110 | 76-128 |
| Heptachlor | 1.98 | 2.00 | 99 | 81-114 |
| Oxychlordane | 1.92 | 2.00 | 96 | 59-141 |
| trans-Nonachlor | 1.76 | 2.00 | 88 | 76-124 |

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QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 07/19/18 |
| **Sample Matrix:** | Water | **Date Extracted:** | 07/06/18 |

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

| | | | |
|---|---|---|---|
| **Analysis Method:** | ALS SOP | **Units:** | ng/L |
| **Prep Method:** | EPA 3535A | **Basis:** | NA |
| | | **Analysis Lot:** | 599147 |

| | Lab Control Sample KQ1809076-01 | | | Duplicate Lab Control Sample KQ1809076-02 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| 2,4'-DDD | 16.4 | 20.0 | 82 | 16.6 | 20.0 | 83 | 79-113 | 2 | 30 |
| 2,4'-DDE | 9.44 | 20.0 | 47 * | 9.95 | 20.0 | 50 * | 75-117 | 5 | 30 |
| 2,4'-DDT | 19.2 | 20.0 | 96 | 20.9 | 20.0 | 104 | 77-114 | 8 | 30 |
| 4,4'-DDD | 20.0 | 20.0 | 100 | 21.6 | 20.0 | 108 | 78-114 | 8 | 30 |
| 4,4'-DDE | 11.9 | 20.0 | 60 * | 13.8 | 20.0 | 69 * | 76-115 | 15 | 30 |
| 4,4'-DDT | 22.3 | 20.0 | 112 | 23.5 | 20.0 | 117 * | 85-113 | 5 | 30 |
| Aldrin | 21.0 | 20.0 | 105 | 22.2 | 20.0 | 111 | 81-113 | 6 | 30 |
| alpha-Chlordane | 17.3 | 20.0 | 86 | 18.4 | 20.0 | 92 | 69-130 | 6 | 30 |
| cis-Nonachlor | 42.6 | 20.0 | 213 * | 45.5 | 20.0 | 227 * | 59-138 | 7 | 30 |
| Dieldrin | 17.4 | 20.0 | 87 | 16.2 | 20.0 | 81 | 62-111 | 7 | 30 |
| gamma-BHC (Lindane) | 19.9 | 20.0 | 99 | 22.0 | 20.0 | 110 | 66-130 | 10 | 30 |
| gamma-Chlordane | 19.3 | 20.0 | 96 | 19.1 | 20.0 | 95 | 72-127 | 1 | 30 |
| Heptachlor | 21.8 | 20.0 | 109 | 22.6 | 20.0 | 113 | 81-115 | 3 | 30 |
| Oxychlordane | 16.4 | 20.0 | 82 | 16.4 | 20.0 | 82 | 77-123 | <1 | 30 |
| trans-Nonachlor | 20.9 | 20.0 | 104 | 21.7 | 20.0 | 108 | 72-127 | 4 | 30 |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 07/19/18 00:58 |
| **Sample Matrix:** | Water | **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:** | KQ1809076-03 | **File ID:** | J:\MS21\Data\071818\071818F038.D\ |
| **Analysis Method:** | ALS SOP | **Analysis Lot:** | 599147 |
| **Prep Method:** | EPA 3535A | **Extraction Lot:** | 317257 |

This Method Blank applies to the following analyses.

| Sample Name | Lab Code | File ID | Date Analyzed |
|---|---|---|---|
| Lab Control Sample | KQ1809076-01 | J:\MS21\Data\071818\071818F039.D\ | 07/19/18 01:26 |
| Duplicate Lab Control Sample | KQ1809076-02 | J:\MS21\Data\071818\071818F040.D\ | 07/19/18 01:54 |
| RB-VV-180703-1720 | K1806305-011 | J:\MS21\Data\071818\071818F041.D\ | 07/19/18 02:22 |

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QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 09/13/18 14:20 |
| **Sample Matrix:** | Sediment | **Date Extracted:** | 08/29/18 |

## Method Blank Summary
## Organochlorine Pesticides by GC/MS/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Instrument ID:** | K-MS-42 |
| **Lab Code:** | KQ1811916-04 | **File ID:** | Y:\MS42\data\091318\091318F006.D |
| **Analysis Method:** | ALS SOP | **Analysis Lot:** | 606987 |
| **Prep Method:** | EPA 3541 | **Extraction Lot:** | 320838 |

This Method Blank applies to the following analyses.

| Sample Name | Lab Code | File ID | Date Analyzed |
|---|---|---|---|
| Lab Control Sample | KQ1811916-03 | Y:\MS42\data\091318\091318F007.D | 09/13/18 14:38 |
| PDI-SG-B463MS | KQ1811916-01 | Y:\MS42\data\091318\091318F008.D | 09/13/18 14:55 |
| PDI-SG-B463DMS | KQ1811916-02 | Y:\MS42\data\091318\091318F009.D | 09/13/18 15:13 |
| PDI-SG-B458 | K1806305-001 | Y:\MS42\data\091318\091318F012.D | 09/13/18 16:06 |
| PDI-SG-B470 | K1806305-002 | Y:\MS42\data\091318\091318F013.D | 09/13/18 16:24 |
| PDI-SG-B469 | K1806305-003 | Y:\MS42\data\091318\091318F014.D | 09/13/18 16:41 |
| PDI-SG-B456 | K1806305-004 | Y:\MS42\data\091318\091318F015.D | 09/13/18 16:59 |
| PDI-SG-B462 | K1806305-005 | Y:\MS42\data\091318\091318F016.D | 09/13/18 17:16 |
| PDI-SG-B463 | K1806305-006 | Y:\MS42\data\091318\091318F017.D | 09/13/18 17:34 |
| PDI-SG-B464 | K1806305-007 | Y:\MS42\data\091318\091318F018.D | 09/13/18 17:52 |
| PDI-SG-B466 | K1806305-008 | Y:\MS42\data\091318\091318F019.D | 09/13/18 18:09 |
| PDI-SG-B468 | K1806305-009 | Y:\MS42\data\091318\091318F020.D | 09/13/18 18:27 |
| PDI-SG-B429 | K1806305-010 | Y:\MS42\data\091318\091318F021.D | 09/13/18 18:44 |

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**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 07/19/18 01:26 |
| **Sample Matrix:** | Water | **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:** | KQ1809076-01 | **File ID:** | J:\MS21\Data\071818\071818F039.D\ |
| **Analysis Method:** | ALS SOP | **Analysis Lot:** | 599147 |
| **Prep Method:** | EPA 3535A | **Extraction Lot:** | 317257 |

This Lab Control Sample applies to the following analyses.

| Sample Name | Lab Code | File ID | Date Analyzed |
|---|---|---|---|
| Method Blank | KQ1809076-03 | J:\MS21\Data\071818\071818F038.D\ | 07/19/18 00:58 |
| Duplicate Lab Control Sample | KQ1809076-02 | J:\MS21\Data\071818\071818F040.D\ | 07/19/18 01:54 |
| RB-VV-180703-1720 | K1806305-011 | J:\MS21\Data\071818\071818F041.D\ | 07/19/18 02:22 |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 09/13/18 14:38 |
| **Sample Matrix:** | Sediment | **Date Extracted:** | 08/29/18 |

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

| | | | |
|---|---|---|---|
| **Sample Name:** | Lab Control Sample | **Instrument ID:** | K-MS-42 |
| **Lab Code:** | KQ1811916-03 | **File ID:** | Y:\MS42\data\091318\091318F007.D |
| **Analysis Method:** | ALS SOP | **Analysis Lot:** | 606987 |
| **Prep Method:** | EPA 3541 | **Extraction Lot:** | 320838 |

This Lab Control Sample applies to the following analyses.

| Sample Name | Lab Code | File ID | Date Analyzed |
|---|---|---|---|
| Method Blank | KQ1811916-04 | Y:\MS42\data\091318\091318F006.D | 09/13/18 14:20 |
| PDI-SG-B463MS | KQ1811916-01 | Y:\MS42\data\091318\091318F008.D | 09/13/18 14:55 |
| PDI-SG-B463DMS | KQ1811916-02 | Y:\MS42\data\091318\091318F009.D | 09/13/18 15:13 |
| PDI-SG-B458 | K1806305-001 | Y:\MS42\data\091318\091318F012.D | 09/13/18 16:06 |
| PDI-SG-B470 | K1806305-002 | Y:\MS42\data\091318\091318F013.D | 09/13/18 16:24 |
| PDI-SG-B469 | K1806305-003 | Y:\MS42\data\091318\091318F014.D | 09/13/18 16:41 |
| PDI-SG-B456 | K1806305-004 | Y:\MS42\data\091318\091318F015.D | 09/13/18 16:59 |
| PDI-SG-B462 | K1806305-005 | Y:\MS42\data\091318\091318F016.D | 09/13/18 17:16 |
| PDI-SG-B463 | K1806305-006 | Y:\MS42\data\091318\091318F017.D | 09/13/18 17:34 |
| PDI-SG-B464 | K1806305-007 | Y:\MS42\data\091318\091318F018.D | 09/13/18 17:52 |
| PDI-SG-B466 | K1806305-008 | Y:\MS42\data\091318\091318F019.D | 09/13/18 18:09 |
| PDI-SG-B468 | K1806305-009 | Y:\MS42\data\091318\091318F020.D | 09/13/18 18:27 |
| PDI-SG-B429 | K1806305-010 | Y:\MS42\data\091318\091318F021.D | 09/13/18 18:44 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 07/18/18 18:57

## Tune Summary
## Organochlorine Pesticides by GC/MS/MS

**File ID:** J:\MS21\Data\071818\071818F025.D\ **Analytical Method:** ALS SOP
**Instrument ID:** K-MSMS-01 **Analysis Lot:** 599147

| Sample Name | Lab Code | File ID: | Date Analyzed: | Q |
|---|---|---|---|---|
| Continuing Calibration Verification | KQ1809714-01 | J:\MS21\Data\071818\071818F025.D\ | 07/18/18 18:57 | |
| Method Blank | KQ1809076-03 | J:\MS21\Data\071818\071818F038.D\ | 07/19/18 00:58 | |
| Lab Control Sample | KQ1809076-01 | J:\MS21\Data\071818\071818F039.D\ | 07/19/18 01:26 | |
| Duplicate Lab Control Sample | KQ1809076-02 | J:\MS21\Data\071818\071818F040.D\ | 07/19/18 01:54 | |
| RB-VV-180703-1720 | K1806305-011 | J:\MS21\Data\071818\071818F041.D\ | 07/19/18 02:22 | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 09/13/18 13:55

## Tune Summary
## Organochlorine Pesticides by GC/MS/MS

**File ID:** Y:\MS42\data\091318\091318F004.D **Analytical Method:** ALS SOP
**Instrument ID:** K-MS-42 **Analysis Lot:** 606987

| Sample Name | Lab Code | File ID: | Date Analyzed: | Q |
|---|---|---|---|---|
| Continuing Calibration Verification | KQ1812946-01 | Y:\MS42\data\091318\091318F004.D | 09/13/18 13:55 | |
| Method Blank | KQ1811916-04 | Y:\MS42\data\091318\091318F006.D | 09/13/18 14:20 | |
| Lab Control Sample | KQ1811916-03 | Y:\MS42\data\091318\091318F007.D | 09/13/18 14:38 | |
| PDI-SG-B463 | KQ1811916-01 | Y:\MS42\data\091318\091318F008.D | 09/13/18 14:55 | |
| PDI-SG-B463 | KQ1811916-02 | Y:\MS42\data\091318\091318F009.D | 09/13/18 15:13 | |
| PDI-SG-B458 | K1806305-001 | Y:\MS42\data\091318\091318F012.D | 09/13/18 16:06 | |
| PDI-SG-B470 | K1806305-002 | Y:\MS42\data\091318\091318F013.D | 09/13/18 16:24 | |
| PDI-SG-B469 | K1806305-003 | Y:\MS42\data\091318\091318F014.D | 09/13/18 16:41 | |
| PDI-SG-B456 | K1806305-004 | Y:\MS42\data\091318\091318F015.D | 09/13/18 16:59 | |
| PDI-SG-B462 | K1806305-005 | Y:\MS42\data\091318\091318F016.D | 09/13/18 17:16 | |
| PDI-SG-B463 | K1806305-006 | Y:\MS42\data\091318\091318F017.D | 09/13/18 17:34 | |
| PDI-SG-B464 | K1806305-007 | Y:\MS42\data\091318\091318F018.D | 09/13/18 17:52 | |
| PDI-SG-B466 | K1806305-008 | Y:\MS42\data\091318\091318F019.D | 09/13/18 18:09 | |
| PDI-SG-B468 | K1806305-009 | Y:\MS42\data\091318\091318F020.D | 09/13/18 18:27 | |
| PDI-SG-B429 | K1806305-010 | Y:\MS42\data\091318\091318F021.D | 09/13/18 18:44 | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 9/11/2018

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

**Calibration ID:** KC1800438 **Signal ID:** 1
**Instrument ID:** K-MS-42

| # | Lab Code | Sample Name | File Location | Acquisition Date |
|---|---|---|---|---|
| 01 | KC1800438-01 | OC PEST ICAL 0.5ng/mL SVM59-48A | 091118F003.D | 09/11/2018 13:51 |
| 02 | KC1800438-02 | OC PEST ICAL 1ng/mL SVM59-48B | 091118F004.D | 09/11/2018 14:09 |
| 03 | KC1800438-03 | OC PEST ICAL 2ng/mL SVM59-48C | 091118F005.D | 09/11/2018 14:27 |
| 04 | KC1800438-04 | OC PEST ICAL 5ng/mL SVM59-48D | 091118F006.D | 09/11/2018 14:44 |
| 05 | KC1800438-05 | OC PEST ICAL 10ng/mL SVM59-48E | 091118F007.D | 09/11/2018 15:02 |
| 06 | KC1800438-06 | OC PEST ICAL 20ng/mL SVM59-48F | 091118F008.D | 09/11/2018 15:20 |
| 07 | KC1800438-07 | OC PEST ICAL 40ng/mL SVM59-48G | 091118F009.D | 09/11/2018 15:37 |
| 08 | KC1800438-08 | OC PEST ICAL 60ng/mL SVM59-48H | 091118F010.D | 09/11/2018 15:55 |
| 09 | KC1800438-09 | OC PEST ICAL 80ng/mL SVM59-48I | 091118F011.D | 09/11/2018 16:12 |
| 10 | KC1800438-10 | OC PEST ICAL 100ng/mL SVM59-48J | 091118F012.D | 09/11/2018 16:30 |

## Analyte

**2,4'-DDD**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.223 | 02 | 1 | 1.143 | 03 | 2 | 1.16 | 04 | 5 | 1.18 |
| 05 | 10 | 1.153 | 06 | 20 | 1.246 | 07 | 40 | 1.114 | 08 | 60 | 1.186 |
| 09 | 80 | 1.132 | 10 | 100 | 1.044 | | | | | | |

**2,4'-DDE**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.709 | 02 | 1 | 1.574 | 03 | 2 | 1.727 | 04 | 5 | 1.777 |
| 05 | 10 | 1.716 | 06 | 20 | 1.823 | 07 | 40 | 1.709 | 08 | 60 | 1.729 |
| 09 | 80 | 1.608 | 10 | 100 | 1.554 | | | | | | |

**2,4'-DDT**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 3.179 | 02 | 1 | 2.854 | 03 | 2 | 3.036 | 04 | 5 | 2.983 |
| 05 | 10 | 2.902 | 06 | 20 | 3.251 | 07 | 40 | 3.389 | 08 | 60 | 3.437 |
| 09 | 80 | 3.541 | 10 | 100 | 3.579 | | | | | | |

**4,4'-DDD**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.841 | 02 | 1 | 1.585 | 03 | 2 | 1.674 | 04 | 5 | 1.551 |
| 05 | 10 | 1.695 | 06 | 20 | 1.841 | 07 | 40 | 1.766 | 08 | 60 | 1.691 |
| 09 | 80 | 1.803 | 10 | 100 | 1.747 | | | | | | |

**4,4'-DDE**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.379 | 02 | 1 | 1.391 | 03 | 2 | 1.426 | 04 | 5 | 1.424 |
| 05 | 10 | 1.298 | 06 | 20 | 1.379 | 07 | 40 | 1.303 | 08 | 60 | 1.396 |
| 09 | 80 | 1.321 | 10 | 100 | 1.214 | | | | | | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 9/11/2018

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

**Calibration ID:** KC1800438 **Signal ID:** 1
**Instrument ID:** K-MS-42

## Analyte

**4,4'-DDT**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.162 | 02 | 1 | 0.9771 | 03 | 2 | 1.085 | 04 | 5 | 1.07 |
| 05 | 10 | 1.091 | 06 | 20 | 1.196 | 07 | 40 | 1.193 | 08 | 60 | 1.205 |
| 09 | 80 | 1.268 | 10 | 100 | 1.25 | | | | | | |

**Aldrin**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 3.898 | 02 | 1 | 2.438 | 03 | 2 | 1.41 | 04 | 5 | 0.9193 |
| 05 | 10 | 0.7985 | 06 | 20 | 0.7579 | 07 | 40 | 0.6658 | 08 | 60 | 0.6849 |
| 09 | 80 | 0.6373 | 10 | 100 | 0.7097 | | | | | | |

**Dieldrin**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 2.384 | 02 | 1 | 2.329 | 03 | 2 | 2.087 | 04 | 5 | 2.16 |
| 05 | 10 | 2.012 | 06 | 20 | 2.262 | 07 | 40 | 2.333 | 08 | 60 | 2.544 |
| 09 | 80 | 2.589 | 10 | 100 | 2.647 | | | | | | |

**Heptachlor**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.194 | 02 | 1 | 1.151 | 03 | 2 | 1.099 | 04 | 5 | 1.077 |
| 05 | 10 | 1.061 | 06 | 20 | 1.118 | 07 | 40 | 1.11 | 08 | 60 | 1.068 |
| 09 | 80 | 1.087 | 10 | 100 | 1.124 | | | | | | |

**Oxychlordane**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 3.138 | 02 | 1 | 2.904 | 03 | 2 | 3.002 | 04 | 5 | 2.883 |
| 05 | 10 | 2.818 | 06 | 20 | 3.057 | 07 | 40 | 3.08 | 08 | 60 | 2.89 |
| 09 | 80 | 3.034 | 10 | 100 | 3.128 | | | | | | |

**S_4,4'-DDT-d4**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 5 | 0.6767 | 02 | 5 | 0.7469 | 03 | 5 | 0.7131 | 04 | 5 | 0.6823 |
| 05 | 5 | 0.7222 | 06 | 5 | 0.6955 | 07 | 5 | 0.7199 | 08 | 5 | 0.7844 |
| 09 | 5 | 0.8099 | 10 | 5 | 0.7748 | | | | | | |

**S_4,4'DDD-d4**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 5 | 1.995 | 02 | 5 | 2.187 | 03 | 5 | 2.09 | 04 | 5 | 2.082 |
| 05 | 5 | 2.047 | 06 | 5 | 1.976 | 07 | 5 | 2.277 | 08 | 5 | 2.411 |
| 09 | 5 | 2.494 | 10 | 5 | 2.57 | | | | | | |

**S_Aldrin-13C12**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.5273 | 02 | 20 | 0.5384 | 03 | 20 | 0.5476 | 04 | 20 | 0.6093 |
| 05 | 20 | 0.5498 | 06 | 20 | 0.5332 | 07 | 20 | 0.5767 | 08 | 20 | 0.5706 |
| 09 | 20 | 0.5591 | 10 | 20 | 0.497 | | | | | | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 9/11/2018

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

**Calibration ID:** KC1800438 **Signal ID:** 1
**Instrument ID:** K-MS-42

## Analyte

**S_Endrin-13C12**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.07717 | 02 | 20 | 0.08321 | 03 | 20 | 0.0837 | 04 | 20 | 0.0816 |
| 05 | 20 | 0.08564 | 06 | 20 | 0.07776 | 07 | 20 | 0.08281 | 08 | 20 | 0.08454 |
| 09 | 20 | 0.08299 | 10 | 20 | 0.07791 | | | | | | |

**S_GBHCD6**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 1.752 | 02 | 20 | 1.853 | 03 | 20 | 1.83 | 04 | 20 | 2.084 |
| 05 | 20 | 1.862 | 06 | 20 | 1.774 | 07 | 20 | 1.875 | 08 | 20 | 1.831 |
| 09 | 20 | 1.694 | 10 | 20 | 1.52 | | | | | | |

**S_Heptachlor-13C10**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.3365 | 02 | 20 | 0.35 | 03 | 20 | 0.363 | 04 | 20 | 0.3823 |
| 05 | 20 | 0.3688 | 06 | 20 | 0.372 | 07 | 20 | 0.3883 | 08 | 20 | 0.3853 |
| 09 | 20 | 0.4111 | 10 | 20 | 0.3801 | | | | | | |

**S_Heptachlrepox13C10**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.1211 | 02 | 20 | 0.1337 | 03 | 20 | 0.1227 | 04 | 20 | 0.1383 |
| 05 | 20 | 0.1292 | 06 | 20 | 0.1303 | 07 | 20 | 0.1353 | 08 | 20 | 0.1334 |
| 09 | 20 | 0.1368 | 10 | 20 | 0.1338 | | | | | | |

**S_Oxychlordane-13C10**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.3329 | 02 | 20 | 0.3596 | 03 | 20 | 0.3606 | 04 | 20 | 0.3858 |
| 05 | 20 | 0.3605 | 06 | 20 | 0.3487 | 07 | 20 | 0.3806 | 08 | 20 | 0.3874 |
| 09 | 20 | 0.3813 | 10 | 20 | 0.3475 | | | | | | |

**alpha-Chlordane**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 2.7 | 02 | 1 | 2.418 | 03 | 2 | 2.377 | 04 | 5 | 2.272 |
| 05 | 10 | 2.43 | 06 | 20 | 2.495 | 07 | 40 | 2.528 | 08 | 60 | 2.434 |
| 09 | 80 | 2.566 | 10 | 100 | 2.639 | | | | | | |

**cis-Nonachlor**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.6715 | 02 | 1 | 0.6999 | 03 | 2 | 0.5806 | 04 | 5 | 0.5321 |
| 05 | 10 | 0.5735 | 06 | 20 | 0.6116 | 07 | 40 | 0.624 | 08 | 60 | 0.6456 |
| 09 | 80 | 0.6668 | 10 | 100 | 0.7372 | | | | | | |

**gamma-BHC (Lindane)**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 2.515 | 02 | 1 | 2.426 | 03 | 2 | 2.56 | 04 | 5 | 2.53 |
| 05 | 10 | 2.507 | 06 | 20 | 2.639 | 07 | 40 | 2.401 | 08 | 60 | 2.595 |
| 09 | 80 | 2.736 | 10 | 100 | 2.811 | | | | | | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 9/11/2018

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

**Calibration ID:** KC1800438 **Signal ID:** 1
**Instrument ID:** K-MS-42

## Analyte

**gamma-Chlordane**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.9941 | 02 | 1 | 0.8996 | 03 | 2 | 0.9425 | 04 | 5 | 0.8744 |
| 05 | 10 | 0.8576 | 06 | 20 | 1.021 | 07 | 40 | 0.9707 | 08 | 60 | 1.032 |
| 09 | 80 | 1.026 | 10 | 100 | 1.065 | | | | | | |

**trans-Nonachlor**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.83 | 02 | 1 | 1.687 | 03 | 2 | 1.619 | 04 | 5 | 1.497 |
| 05 | 10 | 1.536 | 06 | 20 | 1.651 | 07 | 40 | 1.678 | 08 | 60 | 1.755 |
| 09 | 80 | 1.824 | 10 | 100 | 1.914 | | | | | | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 9/11/2018

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

**Calibration ID:** KC1800438 **Signal ID:** 1
**Instrument ID:** K-MS-42

| | | 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 | 4.9 | ≤20 | 1.158 | 0.01 |
| 2,4'-DDE | TRG | Average RF | % RSD | 5.1 | ≤20 | 1.693 | 0.01 |
| 2,4'-DDT | TRG | Average RF | % RSD | 8.3 | ≤20 | 3.215 | 0.01 |
| 4,4'-DDD | TRG | Average RF | % RSD | 5.8 | ≤20 | 1.719 | 0.01 |
| 4,4'-DDE | TRG | Average RF | % RSD | 5.0 | ≤20 | 1.353 | 0.01 |
| 4,4'-DDT | TRG | Average RF | % RSD | 7.9 | ≤20 | 1.15 | 0.01 |
| Aldrin | TRG | Quadratic | COD | 0.9961 | ≥ | 1.292 | 0.01 |
| Dieldrin | TRG | Average RF | % RSD | 9.1 | ≤20 | 2.335 | 0.01 |
| Heptachlor | TRG | Average RF | % RSD | 3.7 | ≤20 | 1.109 | 0.01 |
| Oxychlordane | TRG | Average RF | % RSD | 3.8 | ≤20 | 2.993 | 0.01 |
| S_4,4'-DDT-d4 | SURR | Average RF | % RSD | 6.2 | ≤ | 0.7326 | 0.01 |
| S_4,4'DDD-d4 | SURR | Average RF | % RSD | 9.7 | ≤ | 2.213 | 0.01 |
| S_Aldrin-13C12 | SURR | Average RF | % RSD | 5.6 | ≤ | 0.5509 | 0.01 |
| S_Endrin-13C12 | SURR | Average RF | % RSD | 3.7 | ≤ | 0.08173 | 0.01 |
| S_GBHCD6 | SURR | Average RF | % RSD | 8.0 | ≤ | 1.808 | 0.01 |
| S_Heptachlor-13C10 | SURR | Average RF | % RSD | 5.6 | ≤ | 0.3737 | 0.01 |
| S_Heptachlrepox13C10 | SURR | Average RF | % RSD | 4.4 | ≤ | 0.1314 | 0.01 |
| S_Oxychlordane-13C10 | SURR | Average RF | % RSD | 5.1 | ≤ | 0.3645 | 0.01 |
| alpha-Chlordane | TRG | Average RF | % RSD | 5.1 | ≤20 | 2.486 | 0.01 |
| cis-Nonachlor | TRG | Average RF | % RSD | 9.8 | ≤20 | 0.6343 | 0.01 |
| gamma-BHC (Lindane) | TRG | Average RF | % RSD | 5.0 | ≤20 | 2.572 | 0.01 |
| gamma-Chlordane | TRG | Average RF | % RSD | 7.4 | ≤20 | 0.9683 | 0.01 |
| trans-Nonachlor | TRG | Average RF | % RSD | 7.8 | ≤20 | 1.699 | 0.01 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 7/16/2018

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

**Calibration ID:** KC1800352 **Signal ID:** 1
**Instrument ID:** K-MSMS-01

| # | Lab Code | Sample Name | File Location | Acquisition Date |
|---|---|---|---|---|
| 01 | KC1800352-01 | | J:\MS21\Data\071618\071618F007.D | 07/16/2018 14:08 |
| 02 | KC1800352-02 | | J:\MS21\Data\071618\071618F008.D | 07/16/2018 14:35 |
| 03 | KC1800352-03 | | J:\MS21\Data\071618\071618F009.D | 07/16/2018 15:03 |
| 04 | KC1800352-04 | | J:\MS21\Data\071618\071618F010.D | 07/16/2018 15:30 |
| 05 | KC1800352-05 | | J:\MS21\Data\071618\071618F011.D | 07/16/2018 15:58 |
| 06 | KC1800352-06 | | J:\MS21\Data\071618\071618F012.D | 07/16/2018 16:25 |
| 07 | KC1800352-07 | | J:\MS21\Data\071618\071618F013.D | 07/16/2018 16:52 |
| 08 | KC1800352-08 | | J:\MS21\Data\071618\071618F014.D | 07/16/2018 17:20 |
| 09 | KC1800352-09 | | J:\MS21\Data\071618\071618F015.D | 07/16/2018 17:47 |
| 10 | KC1800352-10 | | J:\MS21\Data\071618\071618F016.D | 07/16/2018 18:14 |

## Analyte

**2,4'-DDD**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.4891 | 02 | 1.0 | 0.4833 | 03 | 2.0 | 0.4486 | 04 | 5.0 | 0.4179 |
| 05 | 10 | 0.4052 | 06 | 20 | 0.4275 | 07 | 40 | 0.417 | 08 | 60 | 0.4479 |
| 09 | 80 | 0.4222 | 10 | 100 | 0.4403 | | | | | | |

**2,4'-DDE**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.3632 | 02 | 1.0 | 0.4434 | 03 | 2.0 | 0.4083 | 04 | 5.0 | 0.4028 |
| 05 | 10 | 0.4043 | 06 | 20 | 0.4086 | 07 | 40 | 0.4324 | 08 | 60 | 0.4674 |
| 09 | 80 | 0.4477 | 10 | 100 | 0.4665 | | | | | | |

**2,4'-DDT**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.6081 | 02 | 1.0 | 0.6104 | 03 | 2.0 | 0.4854 | 04 | 5.0 | 0.5108 |
| 05 | 10 | 0.4988 | 06 | 20 | 0.5146 | 07 | 40 | 0.4556 | 08 | 60 | 0.5274 |
| 09 | 80 | 0.5247 | 10 | 100 | 0.521 | | | | | | |

**4,4'-DDD**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.6984 | 02 | 1.0 | 0.7338 | 03 | 2.0 | 0.6302 | 04 | 5.0 | 0.5842 |
| 05 | 10 | 0.5716 | 06 | 20 | 0.5812 | 07 | 40 | 0.5647 | 08 | 60 | 0.5773 |
| 09 | 80 | 0.5519 | 10 | 100 | 0.5614 | | | | | | |

**4,4'-DDE**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.3057 | 02 | 1.0 | 0.3453 | 03 | 2.0 | 0.3201 | 04 | 5.0 | 0.2935 |
| 05 | 10 | 0.2952 | 06 | 20 | 0.3063 | 07 | 40 | 0.3133 | 08 | 60 | 0.3301 |
| 09 | 80 | 0.3249 | 10 | 100 | 0.3306 | | | | | | |

**4,4'-DDT**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.698 | 02 | 1.0 | 0.8232 | 03 | 2.0 | 0.6279 | 04 | 5.0 | 0.6583 |
| 05 | 10 | 0.6403 | 06 | 20 | 0.6351 | 07 | 40 | 0.5565 | 08 | 60 | 0.6269 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 7/16/2018

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

**Calibration ID:** KC1800352 **Signal ID:** 1
**Instrument ID:** K-MSMS-01

## Analyte

**4,4'-DDT**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 09 | 80 | 0.6279 | 10 | 100 | 0.6 | | | | | | |

**Aldrin**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 02 | 1.0 | 1.078 | 03 | 2.0 | 0.6493 | 04 | 5.0 | 0.7938 | 05 | 10 | 0.7659 |
| 06 | 20 | 0.7494 | 07 | 40 | 0.7951 | 08 | 60 | 0.8471 | 09 | 80 | 0.7745 |
| 10 | 100 | 0.744 | | | | | | | | | |

**Dieldrin**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.799 | 02 | 1.0 | 1.202 | 03 | 2.0 | 1.198 | 04 | 5.0 | 1.208 |
| 05 | 10 | 1.054 | 06 | 20 | 1.179 | 07 | 40 | 1.142 | 08 | 60 | 1.169 |
| 09 | 80 | 1.106 | 10 | 100 | 1.145 | | | | | | |

**Heptachlor**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.363 | 02 | 1.0 | 1.479 | 03 | 2.0 | 1.149 | 04 | 5.0 | 1.005 |
| 05 | 10 | 1.039 | 06 | 20 | 0.9743 | 07 | 40 | 0.8782 | 08 | 60 | 0.9485 |
| 09 | 80 | 0.9041 | 10 | 100 | 0.8735 | | | | | | |

**Oxychlordane**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.328 | 02 | 1.0 | 1.111 | 03 | 2.0 | 1.094 | 04 | 5.0 | 0.7912 |
| 05 | 10 | 1.01 | 06 | 20 | 0.9637 | 07 | 40 | 0.9494 | 08 | 60 | 0.9211 |
| 09 | 80 | 0.8205 | 10 | 100 | 0.9503 | | | | | | |

**S_4,4'-DDT-d4**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 5 | 3.821 | 02 | 5 | 3.871 | 03 | 5 | 4.238 | 04 | 5 | 3.652 |
| 05 | 5 | 3.831 | 06 | 5 | 3.651 | 07 | 5 | 3.859 | 08 | 5 | 3.882 |
| 09 | 5 | 3.751 | 10 | 5 | 3.855 | | | | | | |

**S_4,4'DDD-d4**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 5 | 7.633 | 02 | 5 | 7.882 | 03 | 5 | 8.109 | 04 | 5 | 7.527 |
| 05 | 5 | 8.037 | 06 | 5 | 7.599 | 07 | 5 | 7.034 | 08 | 5 | 7.456 |
| 09 | 5 | 7.512 | 10 | 5 | 7.311 | | | | | | |

**S_Aldrin-13C12**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.3423 | 02 | 20 | 0.3687 | 03 | 20 | 0.3794 | 04 | 20 | 0.3644 |
| 05 | 20 | 0.4525 | 06 | 20 | 0.4507 | 07 | 20 | 0.425 | 08 | 20 | 0.4442 |
| 09 | 20 | 0.4716 | 10 | 20 | 0.4795 | | | | | | |

**S_Endrin-13C12**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.1593 | 02 | 20 | 0.158 | 03 | 20 | 0.1445 | 04 | 20 | 0.1731 |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 7/16/2018

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

**Calibration ID:** KC1800352 **Signal ID:** 1
**Instrument ID:** K-MSMS-01

## Analyte

**S_Endrin-13C12**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05 | 20 | 0.1673 | 06 | 20 | 0.1601 | 07 | 20 | 0.1638 | 08 | 20 | 0.1787 |
| 09 | 20 | 0.1869 | 10 | 20 | 0.1717 | | | | | | |

**S_GBHCD6**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.9653 | 02 | 20 | 0.9982 | 03 | 20 | 1.053 | 04 | 20 | 1.114 |
| 05 | 20 | 1.132 | 06 | 20 | 1.14 | 07 | 20 | 1.211 | 08 | 20 | 1.26 |
| 09 | 20 | 1.269 | 10 | 20 | 1.227 | | | | | | |

**S_Heptachlor-13C10**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.3484 | 02 | 20 | 0.3439 | 03 | 20 | 0.3791 | 04 | 20 | 0.4138 |
| 05 | 20 | 0.4278 | 06 | 20 | 0.4918 | 07 | 20 | 0.541 | 08 | 20 | 0.5969 |
| 09 | 20 | 0.63 | 10 | 20 | 0.6524 | | | | | | |

**S_Heptachlrepox13C10**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.2936 | 02 | 20 | 0.3086 | 03 | 20 | 0.2996 | 04 | 20 | 0.327 |
| 05 | 20 | 0.3336 | 06 | 20 | 0.3298 | 07 | 20 | 0.3469 | 08 | 20 | 0.3565 |
| 09 | 20 | 0.3558 | 10 | 20 | 0.3581 | | | | | | |

**S_Oxychlordane-13C10**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 20 | 0.1531 | 02 | 20 | 0.1574 | 03 | 20 | 0.1469 | 04 | 20 | 0.1882 |
| 05 | 20 | 0.1823 | 06 | 20 | 0.1728 | 07 | 20 | 0.1458 | 08 | 20 | 0.1828 |
| 09 | 20 | 0.1868 | 10 | 20 | 0.1619 | | | | | | |

**alpha-Chlordane**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 3.782 | 02 | 1.0 | 3.252 | 03 | 2.0 | 2.52 | 04 | 5.0 | 2.414 |
| 05 | 10 | 2.464 | 06 | 20 | 2.703 | 07 | 40 | 3.114 | 08 | 60 | 2.618 |
| 09 | 80 | 2.607 | 10 | 100 | 3.084 | | | | | | |

**cis-Nonachlor**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 3.057 | 02 | 1.0 | 3.066 | 03 | 2.0 | 2.582 | 04 | 5.0 | 1.878 |
| 05 | 10 | 1.843 | 06 | 20 | 1.806 | 07 | 40 | 2.012 | 08 | 60 | 2.001 |
| 09 | 80 | 1.918 | 10 | 100 | 2.265 | | | | | | |

**gamma-BHC (Lindane)**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 0.5295 | 02 | 1.0 | 0.7255 | 03 | 2.0 | 0.5664 | 04 | 5.0 | 0.5434 |
| 05 | 10 | 0.5182 | 06 | 20 | 0.5065 | 07 | 40 | 0.4772 | 08 | 60 | 0.521 |
| 09 | 80 | 0.4875 | 10 | 100 | 0.4998 | | | | | | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 7/16/2018

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

**Calibration ID:** KC1800352 **Signal ID:** 1
**Instrument ID:** K-MSMS-01

## Analyte

**gamma-Chlordane**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 4.492 | 02 | 1.0 | 4.366 | 03 | 2.0 | 2.428 | 04 | 5.0 | 2.875 |
| 05 | 10 | 2.66 | 06 | 20 | 2.817 | 07 | 40 | 3.358 | 08 | 60 | 2.829 |
| 09 | 80 | 2.851 | 10 | 100 | 3.344 | | | | | | |

**trans-Nonachlor**

| # | Amount | RF | # | Amount | RF | # | Amount | RF | # | Amount | RF |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 0.5 | 1.702 | 02 | 1.0 | 2.158 | 03 | 2.0 | 1.97 | 04 | 5.0 | 1.735 |
| 05 | 10 | 1.578 | 06 | 20 | 1.702 | 07 | 40 | 2.089 | 08 | 60 | 1.831 |
| 09 | 80 | 1.847 | 10 | 100 | 2.101 | | | | | | |

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 7/16/2018

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

**Calibration ID:** KC1800352 **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 | 6.4 | ≤20 | 0.4399 | 0.01 |
| 2,4'-DDE | TRG | Average RF | % RSD | 7.7 | ≤20 | 0.4245 | 0.01 |
| 2,4'-DDT | TRG | Average RF | % RSD | 9.3 | ≤20 | 0.5257 | 0.01 |
| 4,4'-DDD | TRG | Average RF | % RSD | 10.3 | ≤20 | 0.6055 | 0.01 |
| 4,4'-DDE | TRG | Average RF | % RSD | 5.3 | ≤20 | 0.3165 | 0.01 |
| 4,4'-DDT | TRG | Average RF | % RSD | 10.9 | ≤20 | 0.6494 | 0.01 |
| Aldrin | TRG | Average RF | % RSD | 14.6 | ≤20 | 0.7996 | 0.01 |
| Dieldrin | TRG | Average RF | % RSD | 17.1 | ≤20 | 1.22 | 0.01 |
| Heptachlor | TRG | Quadratic | COD | 0.9988 | ≥ | 1.061 | 0.01 |
| Oxychlordane | TRG | Average RF | % RSD | 15.6 | ≤20 | 0.9939 | 0.01 |
| S_4,4'-DDT-d4 | SURR | Average RF | % RSD | 4.3 | ≤ | 3.841 | 0.01 |
| S_4,4'DDD-d4 | SURR | Average RF | % RSD | 4.3 | ≤ | 7.61 | 0.01 |
| S_Aldrin-13C12 | SURR | Average RF | % RSD | 11.9 | ≤ | 0.4178 | 0.01 |
| S_Endrin-13C12 | SURR | Average RF | % RSD | 7.2 | ≤ | 0.1664 | 0.01 |
| S_GBHCD6 | SURR | Average RF | % RSD | 9.4 | ≤ | 1.137 | 0.01 |
| S_Heptachlor-13C10 | SURR | Average RF | % RSD | 24.2 | ≤ | 0.4825 | 0.01 |
| S_Heptachlrepox13C10 | SURR | Average RF | % RSD | 7.2 | ≤ | 0.331 | 0.01 |
| S_Oxychlordane-13C10 | SURR | Average RF | % RSD | 10.0 | ≤ | 0.1678 | 0.01 |
| alpha-Chlordane | TRG | Average RF | % RSD | 15.4 | ≤20 | 2.856 | 0.01 |
| cis-Nonachlor | TRG | Quadratic | COD | 0.9943 | ≥ | 2.243 | 0.01 |
| gamma-BHC (Lindane) | TRG | Quadratic | COD | 0.9987 | ≥ | 0.5375 | 0.01 |
| gamma-Chlordane | TRG | Quadratic | COD | 0.9902 | ≥ | 3.202 | 0.01 |
| trans-Nonachlor | TRG | Average RF | % RSD | 10.6 | ≤20 | 1.871 | 0.01 |

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**dba ALS Environmental**

QA/QC Report

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 9/11/2018

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

**Calibration ID:** KC1800438 **Signal ID:** 1
**Instrument ID:** K-MS-42

| # | Lab Code | Sample Name | File Location | Acquisition Date |
|---|---|---|---|---|
| 11 | KC1800438-11 | OC PEST ICV 20ng/mL SVM59-48K | 091118F013.D | 09/11/2018 16:48 |

| Analyte Name | Expected | Result | Average RF | SSV RF | % D | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|
| 2,4'-DDD | 20.0 | 18.7 | 1.158E0 | 1.084E0 | -6.367 | ±25 | Average RF |
| 2,4'-DDE | 20.0 | 19.4 | 1.693E0 | 1.644E0 | -2.875 | ±25 | Average RF |
| 2,4'-DDT | 20.0 | 17.1 | 3.215E0 | 2.751E0 | -14.450 | ±25 | Average RF |
| 4,4'-DDD | 20.0 | 21.0 | 1.719E0 | 1.803E0 | 4.83 | ±25 | Average RF |
| 4,4'-DDE | 20.0 | 19.1 | 1.353E0 | 1.291E0 | -4.595 | ±25 | Average RF |
| 4,4'-DDT | 20.0 | 20.0 | 1.15E0 | 1.15E0 | -0.026 | ±25 | Average RF |
| Aldrin | 20.0 | 20.3 | 1.292E0 | 7.179E-1 | 1.46 | ±25 | Quadratic |
| alpha-Chlordane | 20.0 | 19.9 | 2.486E0 | 2.477E0 | -0.354 | ±25 | Average RF |
| cis-Nonachlor | 20.0 | 18.6 | 6.343E-1 | 5.897E-1 | -7.023 | ±25 | Average RF |
| Dieldrin | 20.0 | 17.3 | 2.335E0 | 2.018E0 | -13.566 | ±25 | Average RF |
| gamma-BHC (Lindane) | 20.0 | 21.0 | 2.572E0 | 2.703E0 | 5.10 | ±25 | Average RF |
| gamma-Chlordane | 20.0 | 21.0 | 9.683E-1 | 1.016E0 | 4.88 | ±25 | Average RF |
| Heptachlor | 20.0 | 20.3 | 1.109E0 | 1.124E0 | 1.33 | ±25 | Average RF |
| Oxychlordane | 20.0 | 21.0 | 2.993E0 | 3.147E0 | 5.12 | ±25 | Average RF |
| trans-Nonachlor | 20.0 | 20.7 | 1.699E0 | 1.758E0 | 3.47 | ±25 | Average RF |

| Analyte Name | Expected | Result | Average RF | SSV RF | Rec. | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|
| S_4,4'DDD-d4 | 5.00 | 4.97 | 2.213E0 | 2.198E0 | 99.4 | 50-200 | Average RF |
| S_4,4'-DDT-d4 | 5.00 | 5.32 | 7.326E-1 | 7.793E-1 | 106 | 50-200 | Average RF |
| S_Aldrin-13C12 | 20.0 | 19.9 | 5.509E-1 | 5.487E-1 | 99.5 | 50-200 | Average RF |
| S_Endrin-13C12 | 20.0 | 21.0 | 8.173E-2 | 8.592E-2 | 105 | 50-200 | Average RF |
| S_GBHCD6 | 20.0 | 18.4 | 1.808E0 | 1.666E0 | 92.0 | 50-200 | Average RF |
| S_Heptachlor-13C10 | 20.0 | 20.8 | 3.737E-1 | 3.895E-1 | 104 | 50-200 | Average RF |
| S_Heptachlrepox13C10 | 20.0 | 19.6 | 1.314E-1 | 1.291E-1 | 98.0 | 50-200 | Average RF |
| S_Oxychlordane-13C10 | 20.0 | 19.5 | 3.645E-1 | 3.563E-1 | 97.5 | 50-200 | Average RF |

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QA/QC Report

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation **Calibration Date:** 7/16/2018

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

**Calibration ID:** KC1800352 **Signal ID:** 1
**Instrument ID:** K-MSMS-01

| # | Lab Code | Sample Name | File Location | Acquisition Date |
|---|---|---|---|---|
| 11 | KC1800352-11 | | J:\MS21\Data\071618\071618F017.D | 07/16/2018 18:42 |

| Analyte Name | Expected | Result | Average RF | SSV RF | % D | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|
| 2,4'-DDD | 20.0 | 18.1 | 4.399E-1 | 3.971E-1 | -9.724 | ±25 | Average RF |
| 2,4'-DDE | 20.0 | 21.3 | 4.245E-1 | 4.526E-1 | 6.63 | ±25 | Average RF |
| 2,4'-DDT | 20.0 | 17.1 | 5.257E-1 | 4.487E-1 | -14.653 | ±25 | Average RF |
| 4,4'-DDD | 20.0 | 18.3 | 6.055E-1 | 5.528E-1 | -8.699 | ±25 | Average RF |
| 4,4'-DDE | 20.0 | 19.6 | 3.165E-1 | 3.095E-1 | -2.209 | ±25 | Average RF |
| 4,4'-DDT | 20.0 | 19.0 | 6.494E-1 | 6.166E-1 | -5.051 | ±25 | Average RF |
| Aldrin | 20.0 | 19.4 | 7.996E-1 | 7.742E-1 | -3.179 | ±25 | Average RF |
| alpha-Chlordane | 20.0 | 24.5 | 2.856E0 | 3.499E0 | 22.52 | ±25 | Average RF |
| cis-Nonachlor | 20.0 | 23.0 | 2.243E0 | 2.124E0 | 15.07 | ±25 | Quadratic |
| Dieldrin | 20.0 | 20.0 | 1.22E0 | 1.217E0 | -0.244 | ±25 | Average RF |
| gamma-BHC (Lindane) | 20.0 | 18.7 | 5.375E-1 | 4.732E-1 | -6.495 | ±25 | Quadratic |
| gamma-Chlordane | 20.0 | 24.0 | 3.202E0 | 3.422E0 | 20.13 | ±25 | Quadratic |
| Heptachlor | 20.0 | 18.5 | 1.061E0 | 8.93E-1 | -7.714 | ±25 | Quadratic |
| Oxychlordane | 20.0 | 23.7 | 9.939E-1 | 1.178E0 | 18.48 | ±25 | Average RF |
| trans-Nonachlor | 20.0 | 22.5 | 1.871E0 | 2.107E0 | 12.57 | ±25 | Average RF |

| Analyte Name | Expected | Result | Average RF | SSV RF | Rec. | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|
| S_4,4'DDD-d4 | 5.00 | 5.28 | 7.61E0 | 8.032E0 | 106 | 50-200 | Average RF |
| S_4,4'-DDT-d4 | 5.00 | 4.86 | 3.841E0 | 3.731E0 | 97.2 | 50-200 | Average RF |
| S_Aldrin-13C12 | 20.0 | 22.8 | 4.178E-1 | 4.769E-1 | 114 | 50-200 | Average RF |
| S_Endrin-13C12 | 20.0 | 22.9 | 1.664E-1 | 1.905E-1 | 115 | 50-200 | Average RF |
| S_GBHCD6 | 20.0 | 23.2 | 1.137E0 | 1.32E0 | 116 | 50-200 | Average RF |
| S_Heptachlor-13C10 | 20.0 | 19.7 | 4.825E-1 | 4.761E-1 | 98.5 | 50-200 | Average RF |
| S_Heptachlrepox13C10 | 20.0 | 24.7 | 3.31E-1 | 4.08E-1 | 124 | 50-200 | Average RF |
| S_Oxychlordane-13C10 | 20.0 | 20.4 | 1.678E-1 | 1.711E-1 | 102 | 50-200 | Average RF |

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 07/18/18 18:57 |

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

| | | | |
|---|---|---|---|
| **Analysis Method:** | ALS SOP | **Calibration Date:** | 7/16/2018 |
| **File ID:** | J:\MS21\Data\071818\071818F025.D\ | **Calibration ID:** | KC1800352 |
| **Signal ID:** | 1 | **Analysis Lot:** | 599147 |
| | | **Units:** | ng/mL |

| Analyte Name | Expected | Result | Average RF | CCV RF | % D | % Drift | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|---|
| **2,4'-DDD** | 20.0 | 19.0 | 0.4399 | 0.417 | -5.2 | NA | ±25 | Average RF |
| **2,4'-DDE** | 20.0 | 18.7 | 0.4245 | 0.3959 | -6.7 | NA | ±25 | Average RF |
| **2,4'-DDT** | 20.0 | 21.5 | 0.5257 | 0.5653 | 7.5 | NA | ±25 | Average RF |
| **4,4'-DDD** | 20.0 | 19.0 | 0.6055 | 0.5757 | -4.9 | NA | ±25 | Average RF |
| **4,4'-DDE** | 20.0 | 19.6 | 0.3165 | 0.3095 | -2.2 | NA | ±25 | Average RF |
| **4,4'-DDT** | 20.0 | 21.1 | 0.6494 | 0.6851 | 5.5 | NA | ±25 | Average RF |
| **Aldrin** | 20.0 | 21.3 | 0.7996 | 0.8522 | 6.6 | NA | ±25 | Average RF |
| **alpha-Chlordane** | 20.0 | 16.5 | 2.8558 | 2.3502 | -17.7 | NA | ±25 | Average RF |
| **cis-Nonachlor** | 20.0 | 19.0 | 2.2428 | 1.7403 | NA | -5.2 | ±25 | Quadratic |
| **Dieldrin** | 20.0 | 19.1 | 1.2202 | 1.1655 | -4.5 | NA | ±25 | Average RF |
| **gamma-BHC (Lindane)** | 20.0 | 21.4 | 0.5375 | 0.5397 | NA | 6.8 | ±25 | Quadratic |
| **gamma-Chlordane** | 20.0 | 19.0 | 3.2021 | 2.6894 | NA | -5.1 | ±25 | Quadratic |
| **Heptachlor** | 20.0 | 19.1 | 1.0613 | 0.9239 | NA | -4.4 | ±25 | Quadratic |
| **Oxychlordane** | 20.0 | 17.8 | 0.9939 | 0.8829 | -11.2 | NA | ±25 | Average RF |
| **trans-Nonachlor** | 20.0 | 18.4 | 1.8715 | 1.7257 | -7.8 | NA | ±25 | Average RF |

| Analyte Name | Expected | Result | Average RF | CCV RF | Rec. | % Drift | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|---|
| **S_4,4'DDD-d4** | 5.00 | 4.25 | 7.6099 | 6.4746 | 85.1 | NA | 50-200 | Average RF |
| **S_4,4'-DDT-d4** | 5.00 | 3.43 | 3.8412 | 2.6343 | 68.6 | NA | 50-200 | Average RF |
| **S_Aldrin-13C12** | 20.0 | 14.5 | 0.4178 | 0.3039 | 72.7 | NA | 50-200 | Average RF |
| **S_Endrin-13C12** | 20.0 | 15.0 | 0.1664 | 0.1244 | 74.8 | NA | 50-200 | Average RF |
| **S_GBHCD6** | 20.0 | 16.2 | 1.1368 | 0.9189 | 80.8 | NA | 50-200 | Average RF |
| **S_Heptachlor-13C10** | 20.0 | 14.5 | 0.4825 | 0.3491 | 72.3 | NA | 50-200 | Average RF |
| **S_Heptachlrepox13C10** | 20.0 | 13.6 | 0.331 | 0.2249 | 68.0 | NA | 50-200 | Average RF |
| **S_Oxychlordane-13C10** | 20.0 | 15.6 | 0.1678 | 0.1305 | 77.8 | NA | 50-200 | Average RF |

| | | | |
|---|---|---|---|
| **Client:** | AECOM | **Service Request:** | K1806305 |
| **Project:** | Portland Harbor Pre-Remedial Design Investigation/60566335 | **Date Analyzed:** | 09/13/18 13:55 |

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

| | | | |
|---|---|---|---|
| **Analysis Method:** | ALS SOP | **Calibration Date:** | 9/11/2018 |
| **File ID:** | Y:\MS42\data\091318\091318F004.D | **Calibration ID:** | KC1800438 |
| **Signal ID:** | 1 | **Analysis Lot:** | 606987 |
| | | **Units:** | ng/mL |

| Analyte Name | Expected | Result | Average RF | CCV RF | % D | % Drift | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|---|
| **2,4'-DDD** | 20.0 | 19.2 | 1.158 | 1.1095 | -4.2 | NA | ±25 | Average RF |
| **2,4'-DDE** | 20.0 | 21.0 | 1.6927 | 1.7792 | 5.1 | NA | ±25 | Average RF |
| **2,4'-DDT** | 20.0 | 19.2 | 3.2152 | 3.0785 | -4.2 | NA | ±25 | Average RF |
| **4,4'-DDD** | 20.0 | 19.9 | 1.7195 | 1.7109 | -0.5 | NA | ±25 | Average RF |
| **4,4'-DDE** | 20.0 | 18.6 | 1.3533 | 1.2607 | -6.8 | NA | ±25 | Average RF |
| **4,4'-DDT** | 20.0 | 19.0 | 1.1498 | 1.0939 | -4.9 | NA | ±25 | Average RF |
| **Aldrin** | 20.0 | 19.2 | 1.2919 | 0.6831 | NA | -4.0 | ±25 | Quadratic |
| **alpha-Chlordane** | 20.0 | 18.9 | 2.486 | 2.3493 | -5.5 | NA | ±25 | Average RF |
| **cis-Nonachlor** | 20.0 | 19.0 | 0.6343 | 0.6023 | -5.0 | NA | ±25 | Average RF |
| **Dieldrin** | 20.0 | 19.7 | 2.3346 | 2.3051 | -1.3 | NA | ±25 | Average RF |
| **gamma-BHC (Lindane)** | 20.0 | 20.0 | 2.572 | 2.5746 | 0.1 | NA | ±25 | Average RF |
| **gamma-Chlordane** | 20.0 | 18.9 | 0.9683 | 0.9143 | -5.6 | NA | ±25 | Average RF |
| **Heptachlor** | 20.0 | 20.8 | 1.109 | 1.1511 | 3.8 | NA | ±25 | Average RF |
| **Oxychlordane** | 20.0 | 19.7 | 2.9933 | 2.943 | -1.7 | NA | ±25 | Average RF |
| **trans-Nonachlor** | 20.0 | 18.3 | 1.6991 | 1.5578 | -8.3 | NA | ±25 | Average RF |

| Analyte Name | Expected | Result | Average RF | CCV RF | Rec. | % Drift | Criteria | Curve Fit |
|---|---|---|---|---|---|---|---|---|
| **S_4,4'DDD-d4** | 5.00 | 4.60 | 2.2129 | 2.0362 | 92.0 | NA | 50-200 | Average RF |
| **S_4,4'-DDT-d4** | 5.00 | 4.87 | 0.7326 | 0.7137 | 97.4 | NA | 50-200 | Average RF |
| **S_Aldrin-13C12** | 20.0 | 17.5 | 0.5509 | 0.483 | 87.7 | NA | 50-200 | Average RF |
| **S_Endrin-13C12** | 20.0 | 18.3 | 0.0817 | 0.0749 | 91.6 | NA | 50-200 | Average RF |
| **S_GBHCD6** | 20.0 | 17.8 | 1.8075 | 1.6105 | 89.1 | NA | 50-200 | Average RF |
| **S_Heptachlor-13C10** | 20.0 | 18.8 | 0.3737 | 0.3522 | 94.2 | NA | 50-200 | Average RF |
| **S_Heptachlrepox13C10** | 20.0 | 18.9 | 0.1314 | 0.124 | 94.3 | NA | 50-200 | Average RF |
| **S_Oxychlordane-13C10** | 20.0 | 19.0 | 0.3645 | 0.3466 | 95.1 | NA | 50-200 | Average RF |

**ALS Group USA, Corp.**
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QA/QC Report

**Client:** AECOM **Service Request:**K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335

## Analysis Run Log
## Organochlorine Pesticides by GC/MS/MS

**Analysis Method:** ALS SOP **Analysis Lot:**599147
**Instrument ID:**K-MSMS-01

| Raw Data File | Sample Name | Lab Code | Date Analyzed | Time Analyzed | Q |
|---|---|---|---|---|---|
| J:\MS21\Data\071818\071818F025.D\ | Continuing Calibration Verification | KQ1809714-01 | 7/18/2018 | 18:57:02 | |
| J:\MS21\Data\071818\071818F026.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 19:24:49 | |
| J:\MS21\Data\071818\071818F027.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 19:52:34 | |
| J:\MS21\Data\071818\071818F028.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 20:20:20 | |
| J:\MS21\Data\071818\071818F029.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 20:48:06 | |
| J:\MS21\Data\071818\071818F030.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 21:15:52 | |
| J:\MS21\Data\071818\071818F031.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 21:43:57 | |
| J:\MS21\Data\071818\071818F032.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 22:11:49 | |
| J:\MS21\Data\071818\071818F033.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 22:39:41 | |
| J:\MS21\Data\071818\071818F034.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 23:07:33 | |
| J:\MS21\Data\071818\071818F035.D\ | ZZZZZZZ | ZZZZZZZ | 7/18/2018 | 23:35:23 | |
| J:\MS21\Data\071818\071818F036.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 00:03:16 | |
| J:\MS21\Data\071818\071818F037.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 00:31:08 | |
| J:\MS21\Data\071818\071818F038.D\ | Method Blank | KQ1809076-03 | 7/19/2018 | 00:58:59 | |
| J:\MS21\Data\071818\071818F039.D\ | Lab Control Sample | KQ1809076-01 | 7/19/2018 | 01:26:51 | |
| J:\MS21\Data\071818\071818F040.D\ | Duplicate Lab Control Sample | KQ1809076-02 | 7/19/2018 | 01:54:47 | |
| J:\MS21\Data\071818\071818F041.D\ | RB-VV-180703-1720 | K1806305-011 | 7/19/2018 | 02:22:44 | |
| J:\MS21\Data\071818\071818F042.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 02:50:41 | |
| J:\MS21\Data\071818\071818F043.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 03:18:43 | |
| J:\MS21\Data\071818\071818F044.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 03:46:40 | |
| J:\MS21\Data\071818\071818F045.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 04:14:41 | |
| J:\MS21\Data\071818\071818F046.D\ | ZZZZZZZ | ZZZZZZZ | 7/19/2018 | 04:42:43 | |

**ALS Group USA, Corp.**
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QA/QC Report

**Client:** AECOM **Service Request:**K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335

## Analysis Run Log
## Organochlorine Pesticides by GC/MS/MS

**Analysis Method:** ALS SOP **Analysis Lot:**606987
**Instrument ID:**K-MS-42

| Raw Data File | Sample Name | Lab Code | Date Analyzed | Time Analyzed | Q |
|---|---|---|---|---|---|
| Y:\MS42\data\091318\091318F004.D | Continuing Calibration Verification | KQ1812946-01 | 9/13/2018 | 13:55 | |
| Y:\MS42\data\091318\091318F006.D | Method Blank | KQ1811916-04 | 9/13/2018 | 14:20 | |
| Y:\MS42\data\091318\091318F007.D | Lab Control Sample | KQ1811916-03 | 9/13/2018 | 14:38 | |
| Y:\MS42\data\091318\091318F008.D | PDI-SG-B463 MS | KQ1811916-01 | 9/13/2018 | 14:55 | |
| Y:\MS42\data\091318\091318F009.D | PDI-SG-B463 DMS | KQ1811916-02 | 9/13/2018 | 15:13 | |
| Y:\MS42\data\091318\091318F010.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 15:31 | |
| Y:\MS42\data\091318\091318F011.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 15:48 | |
| Y:\MS42\data\091318\091318F012.D | PDI-SG-B458 | K1806305-001 | 9/13/2018 | 16:06 | |
| Y:\MS42\data\091318\091318F013.D | PDI-SG-B470 | K1806305-002 | 9/13/2018 | 16:24 | |
| Y:\MS42\data\091318\091318F014.D | PDI-SG-B469 | K1806305-003 | 9/13/2018 | 16:41 | |
| Y:\MS42\data\091318\091318F015.D | PDI-SG-B456 | K1806305-004 | 9/13/2018 | 16:59 | |
| Y:\MS42\data\091318\091318F016.D | PDI-SG-B462 | K1806305-005 | 9/13/2018 | 17:16 | |
| Y:\MS42\data\091318\091318F017.D | PDI-SG-B463 | K1806305-006 | 9/13/2018 | 17:34 | |
| Y:\MS42\data\091318\091318F018.D | PDI-SG-B464 | K1806305-007 | 9/13/2018 | 17:52 | |
| Y:\MS42\data\091318\091318F019.D | PDI-SG-B466 | K1806305-008 | 9/13/2018 | 18:09 | |
| Y:\MS42\data\091318\091318F020.D | PDI-SG-B468 | K1806305-009 | 9/13/2018 | 18:27 | |
| Y:\MS42\data\091318\091318F021.D | PDI-SG-B429 | K1806305-010 | 9/13/2018 | 18:44 | |
| Y:\MS42\data\091318\091318F022.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 19:02 | |
| Y:\MS42\data\091318\091318F023.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 19:20 | |
| Y:\MS42\data\091318\091318F024.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 19:37 | |
| Y:\MS42\data\091318\091318F025.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 19:55 | |
| Y:\MS42\data\091318\091318F026.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 20:13 | |
| Y:\MS42\data\091318\091318F027.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 20:30 | |
| Y:\MS42\data\091318\091318F028.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 20:48 | |
| Y:\MS42\data\091318\091318F029.D | ZZZZZZZ | ZZZZZZZ | 9/13/2018 | 21:05 | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

Prep Summary Report

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335
**Sample Matrix:** Sediment

## Organochlorine Pesticides by GC/MS/MS

**Prep Method:** EPA 3541 **Extraction Lot:** 320838
**Analytical Method:** ALS SOP **Extraction Date:** 08/29/18 07:45

| Sample Name | Lab Code | Date Collected | Date Received | Sample Amount | Final Amount | Percent Solids |
|---|---|---|---|---|---|---|
| PDI-SG-B458 | K1806305-001 | 7/2/18 | 7/5/18 | 5.392 g | 1 mL | 51.3 |
| PDI-SG-B470 | K1806305-002 | 7/2/18 | 7/5/18 | 5.270 g | 1 mL | 50.3 |
| PDI-SG-B469 | K1806305-003 | 7/2/18 | 7/5/18 | 5.180 g | 1 mL | 49.4 |
| PDI-SG-B456 | K1806305-004 | 7/2/18 | 7/5/18 | 5.192 g | 1 mL | 58.6 |
| PDI-SG-B462 | K1806305-005 | 7/2/18 | 7/5/18 | 5.217 g | 1 mL | 54.3 |
| PDI-SG-B463 | K1806305-006 | 7/2/18 | 7/5/18 | 5.267 g | 1 mL | 60.6 |
| PDI-SG-B464 | K1806305-007 | 7/2/18 | 7/5/18 | 5.289 g | 1 mL | 50.4 |
| PDI-SG-B466 | K1806305-008 | 7/2/18 | 7/5/18 | 5.227 g | 1 mL | 54.6 |
| PDI-SG-B468 | K1806305-009 | 7/2/18 | 7/5/18 | 5.314 g | 1 mL | 62.3 |
| PDI-SG-B429 | K1806305-010 | 7/3/18 | 7/5/18 | 5.328 g | 1 mL | 50.3 |
| Matrix Spike | KQ1811916-01MS | 7/2/18 | 7/5/18 | 5.259 g | 1 mL | 60.6 |
| Duplicate Matrix Spike | KQ1811916-02DMS | 7/2/18 | 7/5/18 | 5.366 g | 1 mL | 60.6 |
| Lab Control Sample | KQ1811916-03LCS | NA | NA | 10 g | 1 mL | |
| Method Blank | KQ1811916-04MB | NA | NA | 10.0000 g | 1 mL | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

Prep Summary Report

**Client:** AECOM **Service Request:** K1806305
**Project:** Portland Harbor Pre-Remedial Design Investigation/60566335
**Sample Matrix:** Water

## Organochlorine Pesticides by GC/MS/MS

**Prep Method:** EPA 3535A **Extraction Lot:** 317257
**Analytical Method:** ALS SOP **Extraction Date:** 07/06/18 11:05

| Sample Name | Lab Code | Date Collected | Date Received | Sample Amount | Final Amount | Percent Solids |
|---|---|---|---|---|---|---|
| RB-VV-180703-1720 | K1806305-011 | 7/3/18 | 7/5/18 | 980.0000 mL | 1 mL | |
| Lab Control Sample | KQ1809076-01LCS | NA | NA | 1000 mL | 1 mL | |
| Duplicate Lab Control Sample | KQ1809076-02DLCS | NA | NA | 1000 mL | 1 mL | |
| Method Blank | KQ1809076-03MB | NA | NA | 1000 mL | 1 mL | |