ALS Environmental
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June 21, 2018

Analytical Report for Service Request No: K1804093-A

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

RE: Portland Harbor Pre-Remedial Design Investigation / 60566335

Dear Amy,

Enclosed are the results of the sample(s) submitted to our laboratory May 02, 2018
For your reference, these analyses have been assigned our service request number **K1804093.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

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

Service Request: K1804093
Date Received: 05/02/2018

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:

Twelve sediment samples were received for analysis at ALS Environmental on 05/02/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Semivolatiles by GC/MS:

Method 8270D SIM-PAH, 6/5/2018 :The control criteria were exceeded for Terphenyl-d14 in Batch QCMS. The associated matrix spike recoveries of target compounds were in control, indicating the analysis was in control. The surrogate outlier was flagged accordingly. No further corrective action was appropriate.

SMO:

No significant anomalies were noted with this analysis.

Approved by _____ Date 06/21/2018

Chain of Custody

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K1804093

ALS-Environmental-Kelso 1317-S-13th-Ave Kelso, WA 98626 Ph: 360-577-7222 Fax: 360-636-1068	**SURFACE SEDIMENT CHAIN OF CUSTODY**

Client Contact	Project Contact: Amy Dahl / Chelsey Cook	Site Contact: Jennifer Ray / Michaela McCoog	Date: 5/02/18	COC No: 2
AECOM	Tel: (206) 438-2261 / (206) 438-2010	Laboratory Contact: Howard-Holmes	Carrier: Courier	1 of 1 page(s)
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-SMA				

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	Pesticides, PAHs, Total Solids 1669M, 8270-SIM, 160.3	Sample Specific Notes:
PDI-SG-S211	4/30/2018	14:05	SS		TP	1		x	
PDI-SG-S213	4/30/2018	15:05	SS		TP	1		x	
PDI-SG-S220	4/30/2018	16:20	SS		TP	1		x	
PDI-SG-S215	4/30/2018	17:42	SS		TP	1		x	
PDI-SG-S241	5/1/2018	16:50	SS		TP	1		x	
PDI-SG-S235	5/1/2018	17:35	SS		MM	1		x	
PDI-SG-S238	5/1/2018	16:10	SS		MM	1		x	
PDI-SG-S223	5/1/2018	11:00	SS		MM	1		x	
PDI-SG-S225	5/1/2018	12:00	SS		MM	1		x	
PDI-SG-S231	5/1/2018	13:50	SS		MM	1		x	
PDI-SG-S230	5/1/2018	14:45	SS		MM	1		x	
PDI-SG-S234	5/1/2018	15:30	SS		MM	1		x	

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column

Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid

Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Sample Disposal
[ ] Return To Client [X] Disposal By Lab [X] Archive For **12** Months

Special Instructions/QC Requirements & Comments:

SMA Study samples - Log in seperately from SS Study samples

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	5/2/18/1157	[signature]	ALS	5/2/18 1157
[signature]	ALS	5/2/18 1305	[signature]	ALS	5/2/18 1305

PC HH

Cooler Receipt and Preservation Form

Client AECOM Service Request K18 C4093

Received: 5/2/18 Opened: 5/2/18 By: KM Unloaded: 5/2/18 By: KM

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? Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number (NA)	Filed
6.8	6.6	3.1	2.9	-0.2	397			

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

Total Solids

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Analytical Report

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	04/30/18 - 05/01/18
Sample Matrix:	Sediment	**Date Received:**	05/2/18
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-S211	K1804093-001	**31.9**	-	-	1	05/03/18 10:54	
PDI-SG-S213	K1804093-002	**30.2**	-	-	1	05/03/18 10:54	
PDI-SG-S220	K1804093-003	**34.5**	-	-	1	05/03/18 10:54	
PDI-SG-S215	K1804093-004	**29.4**	-	-	1	05/03/18 10:54	
PDI-SG-S241	K1804093-005	**39.8**	-	-	1	05/03/18 10:54	
PDI-SG-S235	K1804093-006	**32.2**	-	-	1	05/03/18 10:54	
PDI-SG-S238	K1804093-007	**32.6**	-	-	1	05/03/18 10:54	
PDI-SG-S223	K1804093-008	**41.5**	-	-	1	05/03/18 10:54	
PDI-SG-S225	K1804093-009	**34.8**	-	-	1	05/03/18 10:54	
PDI-SG-S231	K1804093-010	**30.7**	-	-	1	05/03/18 10:54	
PDI-SG-S230	K1804093-011	**31.4**	-	-	1	05/03/18 10:54	
PDI-SG-S234	K1804093-012	**28.9**	-	-	1	05/03/18 10:54	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	AECOM	**Service Request:**	K1804093
Project	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	04/30/18
Sample Matrix:	Sediment	**Date Received:**	05/02/18
		Date Analyzed:	05/03/18

Replicate Sample Summary
Inorganic Parameters

Sample Name:	PDI-SG-S211	**Units:**	Percent
Lab Code:	K1804093-001	**Basis:**	As Received

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample K1804093-001DUP Result	Average	RPD	RPD Limit
Solids, Total	160.3 Modified	-	-	31.9	31.9	31.9	<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.

Polynuclear Aromatic Hydrocarbons

ALS Environmental—Kelso Laboratory
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Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Cover Page - Organic Analysis Data Package
Polynuclear Aromatic Hydrocarbons

Sample Name	Lab Code	Date Collected	Date Received
PDI-SG-S211	K1804093-001	04/30/2018	05/02/2018
PDI-SG-S213	K1804093-002	04/30/2018	05/02/2018
PDI-SG-S220	K1804093-003	04/30/2018	05/02/2018
PDI-SG-S215	K1804093-004	04/30/2018	05/02/2018
PDI-SG-S241	K1804093-005	05/01/2018	05/02/2018
PDI-SG-S235	K1804093-006	05/01/2018	05/02/2018
PDI-SG-S238	K1804093-007	05/01/2018	05/02/2018
PDI-SG-S223	K1804093-008	05/01/2018	05/02/2018
PDI-SG-S225	K1804093-009	05/01/2018	05/02/2018
PDI-SG-S231	K1804093-010	05/01/2018	05/02/2018
PDI-SG-S230	K1804093-011	05/01/2018	05/02/2018
PDI-SG-S234	K1804093-012	05/01/2018	05/02/2018

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	04/30/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S211	**Units:**	ug/Kg
Lab Code:	K1804093-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**16**	D	7.8	1.2	5	05/09/18	06/05/18	KWG1802343	
2-Methylnaphthalene	**7.6**	JD	7.8	0.94	5	05/09/18	06/05/18	KWG1802343	
Acenaphthylene	**13**	D	3.9	0.36	5	05/09/18	06/05/18	KWG1802343	
Acenaphthene	**8.6**	D	3.9	0.37	5	05/09/18	06/05/18	KWG1802343	
Fluorene	**15**	D	3.9	0.41	5	05/09/18	06/05/18	KWG1802343	
Phenanthrene	**85**	D	3.9	0.52	5	05/09/18	06/05/18	KWG1802343	
Anthracene	**30**	D	3.9	0.30	5	05/09/18	06/05/18	KWG1802343	
Fluoranthene	**290**	D	3.9	0.39	5	05/09/18	06/05/18	KWG1802343	
Pyrene	**320**	D	3.9	0.39	5	05/09/18	06/05/18	KWG1802343	
Benz(a)anthracene	**140**	D	3.9	0.30	5	05/09/18	06/05/18	KWG1802343	
Chrysene	**220**	D	3.9	0.43	5	05/09/18	06/05/18	KWG1802343	
Benzo(b)fluoranthene†	**230**	D	3.9	0.52	5	05/09/18	06/05/18	KWG1802343	
Benzo(k)fluoranthene	**80**	D	3.9	0.45	5	05/09/18	06/05/18	KWG1802343	
Benzo(a)pyrene	**150**	D	3.9	0.57	5	05/09/18	06/05/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	3.9	0.75	5	05/09/18	06/05/18	KWG1802343	
Dibenz(a,h)anthracene	**27**	D	3.9	0.67	5	05/09/18	06/05/18	KWG1802343	
Benzo(g,h,i)perylene	**130**	D	3.9	0.74	5	05/09/18	06/05/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	42-106	06/05/18	Acceptable
Fluoranthene-d10	87	45-109	06/05/18	Acceptable
Terphenyl-d14	94	41-102	06/05/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	04/30/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S213	**Units:**	ug/Kg
Lab Code:	K1804093-002	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**19**	D	8.3	1.3	5	05/09/18	06/05/18	KWG1802343	
2-Methylnaphthalene	**8.6**	D	8.3	0.99	5	05/09/18	06/05/18	KWG1802343	
Acenaphthylene	**15**	D	4.2	0.38	5	05/09/18	06/05/18	KWG1802343	
Acenaphthene	**13**	D	4.2	0.39	5	05/09/18	06/05/18	KWG1802343	
Fluorene	**19**	D	4.2	0.43	5	05/09/18	06/05/18	KWG1802343	
Phenanthrene	**120**	D	4.2	0.55	5	05/09/18	06/05/18	KWG1802343	
Anthracene	**34**	D	4.2	0.32	5	05/09/18	06/05/18	KWG1802343	
Fluoranthene	**330**	D	4.2	0.41	5	05/09/18	06/05/18	KWG1802343	
Pyrene	**330**	D	4.2	0.42	5	05/09/18	06/05/18	KWG1802343	
Benz(a)anthracene	**150**	D	4.2	0.32	5	05/09/18	06/05/18	KWG1802343	
Chrysene	**230**	D	4.2	0.46	5	05/09/18	06/05/18	KWG1802343	
Benzo(b)fluoranthene†	**240**	D	4.2	0.55	5	05/09/18	06/05/18	KWG1802343	
Benzo(k)fluoranthene	**85**	D	4.2	0.47	5	05/09/18	06/05/18	KWG1802343	
Benzo(a)pyrene	**160**	D	4.2	0.61	5	05/09/18	06/05/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**140**	D	4.2	0.79	5	05/09/18	06/05/18	KWG1802343	
Dibenz(a,h)anthracene	**41**	D	4.2	0.71	5	05/09/18	06/05/18	KWG1802343	
Benzo(g,h,i)perylene	**150**	D	4.2	0.79	5	05/09/18	06/05/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	42-106	06/05/18	Acceptable
Fluoranthene-d10	91	45-109	06/05/18	Acceptable
Terphenyl-d14	101	41-102	06/05/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	04/30/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S220	**Units:**	ug/Kg
Lab Code:	K1804093-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**17**	D	7.2	1.1	5	05/09/18	06/05/18	KWG1802343	
2-Methylnaphthalene	**8.6**	D	7.2	0.87	5	05/09/18	06/05/18	KWG1802343	
Acenaphthylene	**14**	D	3.6	0.34	5	05/09/18	06/05/18	KWG1802343	
Acenaphthene	**8.9**	D	3.6	0.34	5	05/09/18	06/05/18	KWG1802343	
Fluorene	**16**	D	3.6	0.38	5	05/09/18	06/05/18	KWG1802343	
Phenanthrene	**99**	D	3.6	0.48	5	05/09/18	06/05/18	KWG1802343	
Anthracene	**31**	D	3.6	0.28	5	05/09/18	06/05/18	KWG1802343	
Fluoranthene	**400**	D	3.6	0.36	5	05/09/18	06/05/18	KWG1802343	
Pyrene	**440**	D	3.6	0.36	5	05/09/18	06/05/18	KWG1802343	
Benz(a)anthracene	**130**	D	3.6	0.28	5	05/09/18	06/05/18	KWG1802343	
Chrysene	**250**	D	3.6	0.40	5	05/09/18	06/05/18	KWG1802343	
Benzo(b)fluoranthene†	**240**	D	3.6	0.48	5	05/09/18	06/05/18	KWG1802343	
Benzo(k)fluoranthene	**78**	D	3.6	0.42	5	05/09/18	06/05/18	KWG1802343	
Benzo(a)pyrene	**140**	D	3.6	0.53	5	05/09/18	06/05/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	3.6	0.70	5	05/09/18	06/05/18	KWG1802343	
Dibenz(a,h)anthracene	**26**	D	3.6	0.62	5	05/09/18	06/05/18	KWG1802343	
Benzo(g,h,i)perylene	**140**	D	3.6	0.69	5	05/09/18	06/05/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	42-106	06/05/18	Acceptable
Fluoranthene-d10	90	45-109	06/05/18	Acceptable
Terphenyl-d14	97	41-102	06/05/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	04/30/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S215	**Units:**	ug/Kg
Lab Code:	K1804093-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**17**	D	8.5	1.3	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**9.4**	D	8.5	1.1	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**13**	D	4.3	0.39	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**10**	D	4.3	0.40	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**16**	D	4.3	0.45	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**110**	D	4.3	0.56	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**30**	D	4.3	0.33	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**320**	D	4.3	0.42	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**360**	D	4.3	0.43	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**130**	D	4.3	0.33	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**220**	D	4.3	0.47	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**230**	D	4.3	0.56	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**80**	D	4.3	0.49	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**140**	D	4.3	0.62	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	4.3	0.82	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**27**	D	4.3	0.73	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**140**	D	4.3	0.81	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	82	42-106	06/06/18	Acceptable
Fluoranthene-d10	89	45-109	06/06/18	Acceptable
Terphenyl-d14	97	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S241	**Units:**	ug/Kg
Lab Code:	K1804093-005	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**140**	D	6.3	0.94	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**35**	D	6.3	0.75	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**18**	D	3.2	0.29	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**31**	D	3.2	0.30	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**29**	D	3.2	0.33	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**160**	D	3.2	0.42	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**42**	D	3.2	0.24	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**300**	D	3.2	0.31	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**380**	D	3.2	0.32	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**130**	D	3.2	0.24	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**190**	D	3.2	0.35	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**210**	D	3.2	0.42	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**70**	D	3.2	0.36	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**150**	D	3.2	0.46	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	3.2	0.60	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**25**	D	3.2	0.54	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**130**	D	3.2	0.60	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	42-106	06/06/18	Acceptable
Fluoranthene-d10	84	45-109	06/06/18	Acceptable
Terphenyl-d14	91	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S235	**Units:**	ug/Kg
Lab Code:	K1804093-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**29**	D	7.8	1.2	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**12**	D	7.8	0.93	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**13**	D	3.9	0.36	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**11**	D	3.9	0.37	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**15**	D	3.9	0.41	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**90**	D	3.9	0.51	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**28**	D	3.9	0.30	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**280**	D	3.9	0.38	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**340**	D	3.9	0.39	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**110**	D	3.9	0.30	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**200**	D	3.9	0.43	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**220**	D	3.9	0.51	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**77**	D	3.9	0.45	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**140**	D	3.9	0.57	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	3.9	0.75	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**27**	D	3.9	0.67	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**150**	D	3.9	0.74	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	71	42-106	06/06/18	Acceptable
Fluoranthene-d10	82	45-109	06/06/18	Acceptable
Terphenyl-d14	86	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S238	**Units:**	ug/Kg
Lab Code:	K1804093-007	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**24**	D	7.6	1.2	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**12**	D	7.6	0.92	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**15**	D	3.8	0.35	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**11**	D	3.8	0.36	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**14**	D	3.8	0.40	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**100**	D	3.8	0.51	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**31**	D	3.8	0.29	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**320**	D	3.8	0.38	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**370**	D	3.8	0.38	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**130**	D	3.8	0.29	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**220**	D	3.8	0.42	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**250**	D	3.8	0.51	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**84**	D	3.8	0.44	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**160**	D	3.8	0.56	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**140**	D	3.8	0.73	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**31**	D	3.8	0.66	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**150**	D	3.8	0.73	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	71	42-106	06/06/18	Acceptable
Fluoranthene-d10	81	45-109	06/06/18	Acceptable
Terphenyl-d14	86	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S223	**Units:**	ug/Kg
Lab Code:	K1804093-008	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**38**	D	6.0	0.90	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**17**	D	6.0	0.72	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**19**	D	3.0	0.28	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**22**	D	3.0	0.29	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**24**	D	3.0	0.32	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**190**	D	3.0	0.40	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**45**	D	3.0	0.23	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**440**	D	3.0	0.30	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**540**	D	3.0	0.30	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**170**	D	3.0	0.23	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**280**	D	3.0	0.33	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**270**	D	3.0	0.40	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**90**	D	3.0	0.35	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**180**	D	3.0	0.44	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**150**	D	3.0	0.58	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**33**	D	3.0	0.52	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**150**	D	3.0	0.57	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	77	42-106	06/06/18	Acceptable
Fluoranthene-d10	86	45-109	06/06/18	Acceptable
Terphenyl-d14	94	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S225	**Units:**	ug/Kg
Lab Code:	K1804093-009	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**30**	D	7.2	1.1	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**12**	D	7.2	0.86	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**15**	D	3.6	0.33	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**14**	D	3.6	0.34	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**16**	D	3.6	0.38	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**120**	D	3.6	0.48	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**37**	D	3.6	0.28	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**340**	D	3.6	0.36	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**420**	D	3.6	0.36	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**140**	D	3.6	0.28	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**230**	D	3.6	0.40	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**260**	D	3.6	0.48	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**88**	D	3.6	0.41	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**160**	D	3.6	0.53	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**140**	D	3.6	0.69	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**32**	D	3.6	0.62	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**150**	D	3.6	0.68	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	83	42-106	06/06/18	Acceptable
Fluoranthene-d10	96	45-109	06/06/18	Acceptable
Terphenyl-d14	101	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S231	**Units:**	ug/Kg
Lab Code:	K1804093-010	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**50**	D	8.2	1.3	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**9.9**	D	8.2	0.98	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**14**	D	4.1	0.38	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**13**	D	4.1	0.39	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**20**	D	4.1	0.43	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**140**	D	4.1	0.54	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**33**	D	4.1	0.31	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**400**	D	4.1	0.40	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**430**	D	4.1	0.41	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**130**	D	4.1	0.31	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**250**	D	4.1	0.45	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**240**	D	4.1	0.54	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**79**	D	4.1	0.47	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**140**	D	4.1	0.60	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	4.1	0.78	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**27**	D	4.1	0.70	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**130**	D	4.1	0.78	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	42-106	06/06/18	Acceptable
Fluoranthene-d10	93	45-109	06/06/18	Acceptable
Terphenyl-d14	99	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S230	**Units:**	ug/Kg
Lab Code:	K1804093-011	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**23**	D	8.0	1.2	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**9.2**	D	8.0	0.95	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**13**	D	4.0	0.37	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**11**	D	4.0	0.38	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**15**	D	4.0	0.42	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**93**	D	4.0	0.53	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**29**	D	4.0	0.31	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**330**	D	4.0	0.39	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**360**	D	4.0	0.40	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**110**	D	4.0	0.31	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**150**	D	4.0	0.44	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**200**	D	4.0	0.53	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**71**	D	4.0	0.46	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**120**	D	4.0	0.58	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**110**	D	4.0	0.76	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**22**	D	4.0	0.69	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**120**	D	4.0	0.76	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	75	42-106	06/06/18	Acceptable
Fluoranthene-d10	87	45-109	06/06/18	Acceptable
Terphenyl-d14	90	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	05/01/2018
Sample Matrix:	Sediment	**Date Received:**	05/02/2018

Polynuclear Aromatic Hydrocarbons

Sample Name:	PDI-SG-S234	**Units:**	ug/Kg
Lab Code:	K1804093-012	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**20**	D	8.7	1.3	5	05/09/18	06/06/18	KWG1802343	
2-Methylnaphthalene	**8.5**	JD	8.7	1.1	5	05/09/18	06/06/18	KWG1802343	
Acenaphthylene	**14**	D	4.4	0.40	5	05/09/18	06/06/18	KWG1802343	
Acenaphthene	**8.2**	D	4.4	0.41	5	05/09/18	06/06/18	KWG1802343	
Fluorene	**14**	D	4.4	0.45	5	05/09/18	06/06/18	KWG1802343	
Phenanthrene	**92**	D	4.4	0.57	5	05/09/18	06/06/18	KWG1802343	
Anthracene	**29**	D	4.4	0.33	5	05/09/18	06/06/18	KWG1802343	
Fluoranthene	**310**	D	4.4	0.43	5	05/09/18	06/06/18	KWG1802343	
Pyrene	**360**	D	4.4	0.44	5	05/09/18	06/06/18	KWG1802343	
Benz(a)anthracene	**110**	D	4.4	0.33	5	05/09/18	06/06/18	KWG1802343	
Chrysene	**160**	D	4.4	0.48	5	05/09/18	06/06/18	KWG1802343	
Benzo(b)fluoranthene†	**230**	D	4.4	0.57	5	05/09/18	06/06/18	KWG1802343	
Benzo(k)fluoranthene	**80**	D	4.4	0.50	5	05/09/18	06/06/18	KWG1802343	
Benzo(a)pyrene	**130**	D	4.4	0.63	5	05/09/18	06/06/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	**120**	D	4.4	0.83	5	05/09/18	06/06/18	KWG1802343	
Dibenz(a,h)anthracene	**27**	D	4.4	0.74	5	05/09/18	06/06/18	KWG1802343	
Benzo(g,h,i)perylene	**140**	D	4.4	0.82	5	05/09/18	06/06/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	78	42-106	06/06/18	Acceptable
Fluoranthene-d10	88	45-109	06/06/18	Acceptable
Terphenyl-d14	95	41-102	06/06/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Analytical Results

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA

Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Units:**	ug/Kg
Lab Code:	KWG1802343-4	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.50	0.15	1	05/09/18	06/05/18	KWG1802343	
2-Methylnaphthalene	ND	U	0.50	0.12	1	05/09/18	06/05/18	KWG1802343	
Acenaphthylene	ND	U	0.25	0.046	1	05/09/18	06/05/18	KWG1802343	
Acenaphthene	ND	U	0.25	0.047	1	05/09/18	06/05/18	KWG1802343	
Fluorene	ND	U	0.25	0.052	1	05/09/18	06/05/18	KWG1802343	
Phenanthrene	ND	U	0.25	0.066	1	05/09/18	06/05/18	KWG1802343	
Anthracene	ND	U	0.25	0.038	1	05/09/18	06/05/18	KWG1802343	
Fluoranthene	ND	U	0.25	0.049	1	05/09/18	06/05/18	KWG1802343	
Pyrene	ND	U	0.25	0.050	1	05/09/18	06/05/18	KWG1802343	
Benz(a)anthracene	ND	U	0.25	0.038	1	05/09/18	06/05/18	KWG1802343	
Chrysene	ND	U	0.25	0.055	1	05/09/18	06/05/18	KWG1802343	
Benzo(b)fluoranthene†	ND	U	0.25	0.066	1	05/09/18	06/05/18	KWG1802343	
Benzo(k)fluoranthene	ND	U	0.25	0.057	1	05/09/18	06/05/18	KWG1802343	
Benzo(a)pyrene	ND	U	0.25	0.073	1	05/09/18	06/05/18	KWG1802343	
Indeno(1,2,3-cd)pyrene	ND	U	0.25	0.096	1	05/09/18	06/05/18	KWG1802343	
Dibenz(a,h)anthracene	ND	U	0.25	0.086	1	05/09/18	06/05/18	KWG1802343	
Benzo(g,h,i)perylene	ND	U	0.25	0.095	1	05/09/18	06/05/18	KWG1802343	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	66	42-106	06/05/18	Acceptable
Fluoranthene-d10	73	45-109	06/05/18	Acceptable
Terphenyl-d14	80	41-102	06/05/18	Acceptable

† Analyte Comments

Benzo(b)fluoranthene	This analyte cannot be separated from Benzo(j)fluoranthene.

Comments:

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335
Sample Matrix: Sediment

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541 **Units:** Percent
Analysis Method: 8270D SIM **Level:** Low

Sample Name	Lab Code	Sur1	Sur2	Sur3	
PDI-SG-S211	K1804093-001	79 D	87 D	94 D	
PDI-SG-S213	K1804093-002	80 D	91 D	101 D	
PDI-SG-S220	K1804093-003	80 D	90 D	97 D	
PDI-SG-S215	K1804093-004	82 D	89 D	97 D	
PDI-SG-S241	K1804093-005	76 D	84 D	91 D	
PDI-SG-S235	K1804093-006	71 D	82 D	86 D	
PDI-SG-S238	K1804093-007	71 D	81 D	86 D	
PDI-SG-S223	K1804093-008	77 D	86 D	94 D	
PDI-SG-S225	K1804093-009	83 D	96 D	101 D	
PDI-SG-S231	K1804093-010	80 D	93 D	99 D	
PDI-SG-S230	K1804093-011	75 D	87 D	90 D	
PDI-SG-S234	K1804093-012	78 D	88 D	95 D	
Batch QC	K1804094-003	65	75	81	
Method Blank	KWG1802343-4	66	73	80	
Batch QCMS	KWG1802343-1	77	92	104	*
Batch QCDMS	KWG1802343-2	68	80	91	
Lab Control Sample	KWG1802343-3	59	67	76	

Surrogate Recovery Control Limits (%)

Sur1	=	Fluorene-d10	42-106
Sur2	=	Fluoranthene-d10	45-109
Sur3	=	Terphenyl-d14	41-102

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

QA/QC Report

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

Service Request: K1804093
Date Analyzed: 06/05/2018
Time Analyzed: 08:50

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060518\0605F002.D
Instrument ID: MS20
Analysis Method: 8270D SIM

Lab Code: KWG1802888-2
Analysis Lot: KWG1802888

		Naphthalene-d8		Acenaphthene-d10		Phenanthrene-d10	
		Area	**RT**	**Area**	**RT**	**Area**	**RT**
	Results ==>	58,368	5.95	32,209	8.27	68,680	11.45
	Upper Limit ==>	116,736	6.45	64,418	8.77	137,360	11.95
	Lower Limit ==>	29,184	5.45	16,105	7.77	34,340	10.95
	ICAL Result ==>	90,101	6.06	44,197	8.42	87,517	11.64
Associated Analyses							
Method Blank	KWG1802343-4	54,435	5.94	30,701	8.27	63,701	11.45
Lab Control Sample	KWG1802343-3	53,541	5.94	29,694	8.26	63,253	11.44
Batch QCMS	KWG1802343-1	55,139	5.94	29,786	8.26	61,370	11.44
Batch QCDMS	KWG1802343-2	54,008	5.94	30,080	8.26	61,357	11.44
Batch QC	K1804094-003	51,717	5.94	29,416	8.26	59,420	11.45
PDI-SG-S211	K1804093-001	55,819	5.95	32,377	8.27	65,156	11.45

Results flagged with an asterisk (*) indicate values outside control criteria.

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

Service Request: K1804093
Date Analyzed: 06/05/2018
Time Analyzed: 08:50

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060518\0605F002.D
Instrument ID: MS20
Analysis Method: 8270D SIM

Lab Code: KWG1802888-2
Analysis Lot: KWG1802888

		Chrysene-d12		Perylene-d12	
		Area	**RT**	**Area**	**RT**
	Results ==>	77,168	18.81	86,850	23.10
	Upper Limit ==>	154,336	19.31	173,700	23.60
	Lower Limit ==>	38,584	18.31	43,425	22.60
	ICAL Result ==>	105,110	19.00	102,151	23.35
Associated Analyses					
Method Blank	KWG1802343-4	73,095	18.81	84,050	23.10
Lab Control Sample	KWG1802343-3	69,680	18.80	80,397	23.09
Batch QCMS	KWG1802343-1	66,000	18.81	78,596	23.12
Batch QCDMS	KWG1802343-2	66,087	18.81	79,277	23.12
Batch QC	K1804094-003	67,279	18.82	75,531	23.12
PDI-SG-S211	K1804093-001	71,381	18.81	83,112	23.12

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Report

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

Service Request: K1804093
Date Analyzed: 06/05/2018
Time Analyzed: 21:21

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060518\0605F021.D
Instrument ID: MS20
Analysis Method: 8270D SIM

Lab Code: KWG1802893-2
Analysis Lot: KWG1802893

		Naphthalene-d8		Acenaphthene-d10		Phenanthrene-d10	
		Area	**RT**	**Area**	**RT**	**Area**	**RT**
	Results ==>	57,893	5.95	32,028	8.27	68,139	11.44
	Upper Limit ==>	115,786	6.45	64,056	8.77	136,278	11.94
	Lower Limit ==>	28,947	5.45	16,014	7.77	34,070	10.94
	ICAL Result ==>	90,101	6.06	44,197	8.42	87,517	11.64
Associated Analyses							
PDI-SG-S213	K1804093-002	56,975	5.94	32,329	8.26	65,917	11.44
PDI-SG-S220	K1804093-003	55,467	5.95	31,955	8.27	64,023	11.45
PDI-SG-S215	K1804093-004	54,980	5.95	32,208	8.27	65,305	11.45
PDI-SG-S241	K1804093-005	55,761	5.95	31,371	8.27	63,218	11.45
PDI-SG-S235	K1804093-006	55,599	5.95	32,201	8.27	63,722	11.45
PDI-SG-S238	K1804093-007	56,127	5.95	32,789	8.27	64,562	11.45
PDI-SG-S223	K1804093-008	55,835	5.95	32,424	8.26	63,671	11.45
PDI-SG-S225	K1804093-009	53,551	5.95	31,340	8.27	61,610	11.45
PDI-SG-S231	K1804093-010	55,586	5.94	32,234	8.27	63,578	11.45

Results flagged with an asterisk (*) indicate values outside control criteria.

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

Service Request: K1804093
Date Analyzed: 06/05/2018
Time Analyzed: 21:21

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060518\0605F021.D
Instrument ID: MS20
Analysis Method: 8270D SIM

Lab Code: KWG1802893-2
Analysis Lot: KWG1802893

		Chrysene-d12		Perylene-d12	
		Area	**RT**	**Area**	**RT**
	Results ==>	76,593	18.81	85,604	23.10
	Upper Limit ==>	153,186	19.31	171,208	23.60
	Lower Limit ==>	38,297	18.31	42,802	22.60
	ICAL Result ==>	105,110	19.00	102,151	23.35
Associated Analyses					
PDI-SG-S213	K1804093-002	78,505	18.81	93,175	23.11
PDI-SG-S220	K1804093-003	69,033	18.81	80,411	23.11
PDI-SG-S215	K1804093-004	69,749	18.81	82,078	23.11
PDI-SG-S241	K1804093-005	68,273	18.81	80,478	23.12
PDI-SG-S235	K1804093-006	69,685	18.81	80,476	23.12
PDI-SG-S238	K1804093-007	70,506	18.81	82,152	23.12
PDI-SG-S223	K1804093-008	68,312	18.82	80,675	23.13
PDI-SG-S225	K1804093-009	67,627	18.81	78,810	23.12
PDI-SG-S231	K1804093-010	70,384	18.81	80,995	23.12

Results flagged with an asterisk (*) indicate values outside control criteria.

QA/QC Report

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

Service Request: K1804093
Date Analyzed: 06/06/2018
Time Analyzed: 06:13

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060618\0606F002.D
Instrument ID: MS20
Analysis Method: 8270D SIM

Lab Code: KWG1802837-2
Analysis Lot: KWG1802837

		Naphthalene-d8		Acenaphthene-d10		Phenanthrene-d10	
		Area	**RT**	**Area**	**RT**	**Area**	**RT**
	Results ==>	56,979	5.95	31,743	8.26	67,806	11.44
	Upper Limit ==>	113,958	6.45	63,486	8.76	135,612	11.94
	Lower Limit ==>	28,490	5.45	15,872	7.76	33,903	10.94
	ICAL Result ==>	90,101	6.06	44,197	8.42	87,517	11.64
Associated Analyses							
PDI-SG-S230	K1804093-011	56,434	5.94	31,986	8.26	62,702	11.44
PDI-SG-S234	K1804093-012	55,446	5.94	31,889	8.26	63,537	11.44

Results flagged with an asterisk (*) indicate values outside control criteria.

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

Service Request: K1804093
Date Analyzed: 06/06/2018
Time Analyzed: 06:13

Internal Standard Area and RT Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060618\0606F002.D
Instrument ID: MS20
Analysis Method: 8270D SIM

Lab Code: KWG1802837-2
Analysis Lot: KWG1802837

		Chrysene-d12		Perylene-d12	
		Area	**RT**	**Area**	**RT**
	Results ==>	75,508	18.80	85,785	23.10
	Upper Limit ==>	151,016	19.30	171,570	23.60
	Lower Limit ==>	37,754	18.30	42,893	22.60
	ICAL Result ==>	105,110	19.00	102,151	23.35
Associated Analyses					
PDI-SG-S230	K1804093-011	68,946	18.81	79,683	23.11
PDI-SG-S234	K1804093-012	68,777	18.81	80,189	23.11

Results flagged with an asterisk (*) indicate values outside control criteria.

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Extracted:**	05/09/2018
Sample Matrix:	Sediment	**Date Analyzed:**	06/05/2018

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Batch QC	**Units:**	ug/Kg
Lab Code:	K1804094-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM	**Extraction Lot:**	KWG1802343

		Batch QCMS KWG1802343-1 Matrix Spike			Batch QCDMS KWG1802343-2 Duplicate Matrix Spike					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**%Rec**	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
Naphthalene	5.4	77.6	133	54	82.6	134	58	37-104	6	40
2-Methylnaphthalene	3.7	87.1	133	63	90.5	134	65	39-115	4	40
Acenaphthylene	1.7	103	133	76	98.4	134	72	39-115	5	40
Acenaphthene	4.6	98.5	133	71	96.4	134	69	41-116	2	40
Fluorene	5.4	109	133	78	105	134	74	43-117	4	40
Phenanthrene	29	137	133	81	127	134	74	42-119	7	40
Anthracene	6.4	118	133	84	114	134	80	42-124	4	40
Fluoranthene	42	180	133	104	158	134	86	42-130	13	40
Pyrene	40	202	133	123	173	134	100	33-125	16	40
Benz(a)anthracene	14	161	133	110	146	134	98	42-123	10	40
Chrysene	21	164	133	107	149	134	96	40-134	9	40
Benzo(b)fluoranthene	22	147	133	95	134	134	84	27-139	9	40
Benzo(k)fluoranthene	6.7	131	133	93	115	134	81	40-125	12	40
Benzo(a)pyrene	15	152	133	103	137	134	91	39-130	11	40
Indeno(1,2,3-cd)pyrene	13	148	133	102	134	134	91	37-143	10	40
Dibenz(a,h)anthracene	3.1	134	133	99	125	134	91	39-141	7	40
Benzo(g,h,i)perylene	14	131	133	88	118	134	77	35-140	11	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Extracted:**	05/09/2018
Sample Matrix:	Sediment	**Date Analyzed:**	06/05/2018

Lab Control Spike Summary
Polynuclear Aromatic Hydrocarbons

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8270D SIM	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG1802343

Lab Control Sample
KWG1802343-3
Lab Control Spike

Analyte Name	Result	Spike Amount	%Rec	%Rec Limits
Naphthalene	69.3	100	69	42-107
2-Methylnaphthalene	69.5	100	70	40-116
Acenaphthylene	69.2	100	69	41-112
Acenaphthene	64.7	100	65	43-113
Fluorene	66.8	100	67	44-114
Phenanthrene	64.9	100	65	44-115
Anthracene	68.7	100	69	45-121
Fluoranthene	74.8	100	75	47-123
Pyrene	81.1	100	81	41-121
Benz(a)anthracene	89.7	100	90	42-123
Chrysene	82.8	100	83	46-130
Benzo(b)fluoranthene	80.9	100	81	46-125
Benzo(k)fluoranthene	76.1	100	76	47-125
Benzo(a)pyrene	82.3	100	82	45-128
Indeno(1,2,3-cd)pyrene	84.7	100	85	45-128
Dibenz(a,h)anthracene	83.7	100	84	44-128
Benzo(g,h,i)perylene	73.2	100	73	43-125

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Extracted:**	05/09/2018
Sample Matrix:	Sediment	**Date Analyzed:**	06/05/2018
		Time Analyzed:	09:29

Method Blank Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Method Blank	**Instrument ID:**	MS20
Lab Code:	KWG1802343-4	**File ID:**	J:\MS20\DATA\060518\0605F003.D
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM	**Extraction Lot:**	KWG1802343

This Method Blank applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Lab Control Sample	KWG1802343-3	J:\MS20\DATA\060518\0605F004.D	06/05/18	10:09
Batch QCMS	KWG1802343-1	J:\MS20\DATA\060518\0605F005.D	06/05/18	10:48
Batch QCDMS	KWG1802343-2	J:\MS20\DATA\060518\0605F006.D	06/05/18	11:28
Batch QC	K1804094-003	J:\MS20\DATA\060518\0605F007.D	06/05/18	12:07
PDI-SG-S211	K1804093-001	J:\MS20\DATA\060518\0605F019.D	06/05/18	20:02
PDI-SG-S213	K1804093-002	J:\MS20\DATA\060518\0605F023.D	06/05/18	22:40
PDI-SG-S220	K1804093-003	J:\MS20\DATA\060518\0605F024.D	06/05/18	23:20
PDI-SG-S215	K1804093-004	J:\MS20\DATA\060518\0605F025.D	06/06/18	00:00
PDI-SG-S241	K1804093-005	J:\MS20\DATA\060518\0605F026.D	06/06/18	00:39
PDI-SG-S235	K1804093-006	J:\MS20\DATA\060518\0605F027.D	06/06/18	01:19
PDI-SG-S238	K1804093-007	J:\MS20\DATA\060518\0605F028.D	06/06/18	01:58
PDI-SG-S223	K1804093-008	J:\MS20\DATA\060518\0605F029.D	06/06/18	02:38
PDI-SG-S225	K1804093-009	J:\MS20\DATA\060518\0605F030.D	06/06/18	03:17
PDI-SG-S231	K1804093-010	J:\MS20\DATA\060518\0605F031.D	06/06/18	03:57
PDI-SG-S230	K1804093-011	J:\MS20\DATA\060618\0606F018.D	06/06/18	16:44
PDI-SG-S234	K1804093-012	J:\MS20\DATA\060618\0606F019.D	06/06/18	17:23

QA/QC Report

Client:	AECOM	**Service Request:**	K1804093
Project:	Portland Harbor Pre-Remedial Design Investigation/60566335	**Date Extracted:**	05/09/2018
Sample Matrix:	Sediment	**Date Analyzed:**	06/05/2018
		Time Analyzed:	10:09

Lab Control Sample Summary
Polynuclear Aromatic Hydrocarbons

Sample Name:	Lab Control Sample	**Instrument ID:**	MS20
Lab Code:	KWG1802343-3	**File ID:**	J:\MS20\DATA\060518\0605F004.D
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270D SIM	**Extraction Lot:**	KWG1802343

This Lab Control Sample applies to the following analyses:

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed
Method Blank	KWG1802343-4	J:\MS20\DATA\060518\0605F003.D	06/05/18	09:29
Batch QCMS	KWG1802343-1	J:\MS20\DATA\060518\0605F005.D	06/05/18	10:48
Batch QCDMS	KWG1802343-2	J:\MS20\DATA\060518\0605F006.D	06/05/18	11:28
Batch QC	K1804094-003	J:\MS20\DATA\060518\0605F007.D	06/05/18	12:07
PDI-SG-S211	K1804093-001	J:\MS20\DATA\060518\0605F019.D	06/05/18	20:02
PDI-SG-S213	K1804093-002	J:\MS20\DATA\060518\0605F023.D	06/05/18	22:40
PDI-SG-S220	K1804093-003	J:\MS20\DATA\060518\0605F024.D	06/05/18	23:20
PDI-SG-S215	K1804093-004	J:\MS20\DATA\060518\0605F025.D	06/06/18	00:00
PDI-SG-S241	K1804093-005	J:\MS20\DATA\060518\0605F026.D	06/06/18	00:39
PDI-SG-S235	K1804093-006	J:\MS20\DATA\060518\0605F027.D	06/06/18	01:19
PDI-SG-S238	K1804093-007	J:\MS20\DATA\060518\0605F028.D	06/06/18	01:58
PDI-SG-S223	K1804093-008	J:\MS20\DATA\060518\0605F029.D	06/06/18	02:38
PDI-SG-S225	K1804093-009	J:\MS20\DATA\060518\0605F030.D	06/06/18	03:17
PDI-SG-S231	K1804093-010	J:\MS20\DATA\060518\0605F031.D	06/06/18	03:57
PDI-SG-S230	K1804093-011	J:\MS20\DATA\060618\0606F018.D	06/06/18	16:44
PDI-SG-S234	K1804093-012	J:\MS20\DATA\060618\0606F019.D	06/06/18	17:23

QA/QC Results

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

Service Request: K1804093
Date Analyzed: 06/05/2018
Time Analyzed: 08:10

Tune Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060518\0605F001.D
Instrument ID: MS20
Column:

Analysis Method: 8270D SIM
Analysis Lot: KWG1802888

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	24.3	50426	PASS
68	69	0	2	0.0	0	PASS
69	198	0	100	26.2	54434	PASS
70	69	0	2	0.4	236	PASS
127	198	10	80	38.1	79114	PASS
197	198	0	2	0.0	0	PASS
198	442	30	100	38.6	207850	PASS
199	198	5	9	6.9	14297	PASS
275	198	10	60	37.4	77765	PASS
365	442	1	50	2.3	12265	PASS
441	443	0	100	83.5	87765	PASS
442	442	100	100	100.0	538581	PASS
443	442	15	24	19.5	105104	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1802888-2	J:\MS20\DATA\060518\0605F002.D	06/05/2018	08:50	
Method Blank	KWG1802343-4	J:\MS20\DATA\060518\0605F003.D	06/05/2018	09:29	
Lab Control Sample	KWG1802343-3	J:\MS20\DATA\060518\0605F004.D	06/05/2018	10:09	
Batch QCMS	KWG1802343-1	J:\MS20\DATA\060518\0605F005.D	06/05/2018	10:48	
Batch QCDMS	KWG1802343-2	J:\MS20\DATA\060518\0605F006.D	06/05/2018	11:28	
Batch QC	K1804094-003	J:\MS20\DATA\060518\0605F007.D	06/05/2018	12:07	
PDI-SG-S211	K1804093-001	J:\MS20\DATA\060518\0605F019.D	06/05/2018	20:02	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

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

Service Request: K1804093
Date Analyzed: 06/05/2018
Time Analyzed: 20:42

Tune Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060518\0605F020.D
Instrument ID: MS20
Column:

Analysis Method: 8270D SIM
Analysis Lot: KWG1802893

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
443	442	15	24	19.4	121000	PASS
51	198	10	80	22.9	53978	PASS
68	69	0	2	0.0	0	PASS
69	198	0	100	24.8	58403	PASS
70	69	0	2	0.5	264	PASS
127	198	10	80	37.2	87717	PASS
197	198	0	2	0.0	0	PASS
198	442	30	100	37.8	235968	PASS
199	198	5	9	6.8	16077	PASS
275	198	10	60	37.9	89442	PASS
365	442	1	50	2.2	13787	PASS
441	443	0	100	83.6	101184	PASS
442	442	100	100	100.0	624661	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1802893-2	J:\MS20\DATA\060518\0605F021.D	06/05/2018	21:21	
PDI-SG-S213	K1804093-002	J:\MS20\DATA\060518\0605F023.D	06/05/2018	22:40	
PDI-SG-S220	K1804093-003	J:\MS20\DATA\060518\0605F024.D	06/05/2018	23:20	
PDI-SG-S215	K1804093-004	J:\MS20\DATA\060518\0605F025.D	06/06/2018	00:00	
PDI-SG-S241	K1804093-005	J:\MS20\DATA\060518\0605F026.D	06/06/2018	00:39	
PDI-SG-S235	K1804093-006	J:\MS20\DATA\060518\0605F027.D	06/06/2018	01:19	
PDI-SG-S238	K1804093-007	J:\MS20\DATA\060518\0605F028.D	06/06/2018	01:58	
PDI-SG-S223	K1804093-008	J:\MS20\DATA\060518\0605F029.D	06/06/2018	02:38	
PDI-SG-S225	K1804093-009	J:\MS20\DATA\060518\0605F030.D	06/06/2018	03:17	
PDI-SG-S231	K1804093-010	J:\MS20\DATA\060518\0605F031.D	06/06/2018	03:57	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

QA/QC Results

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

Service Request: K1804093
Date Analyzed: 06/06/2018
Time Analyzed: 05:33

Tune Summary
Polynuclear Aromatic Hydrocarbons

File ID: J:\MS20\DATA\060618\0606F001.D
Instrument ID: MS20
Column:

Analysis Method: 8270D SIM
Analysis Lot: KWG1802837

Target Mass	Relative to Mass	Lower Limit%	Upper Limit%	Relative Abundance %	Raw Abundance	Result Pass/Fail
51	198	10	80	23.2	55181	PASS
68	69	0	2	0.0	0	PASS
69	198	0	100	25.2	59920	PASS
70	69	0	2	0.6	368	PASS
127	198	10	80	37.6	89314	PASS
197	198	0	2	0.0	0	PASS
198	442	30	100	37.8	237738	PASS
199	198	5	9	6.9	16421	PASS
275	198	10	60	38.6	91818	PASS
365	442	1	50	2.4	14847	PASS
441	443	0	100	82.0	101370	PASS
442	442	100	100	100.0	628309	PASS
443	442	15	24	19.7	123621	PASS

Sample Name	Lab Code	File ID	Date Analyzed	Time Analyzed	Q
Continuing Calibration Verification	KWG1802837-2	J:\MS20\DATA\060618\0606F002.D	06/06/2018	06:13	
PDI-SG-S230	K1804093-011	J:\MS20\DATA\060618\0606F018.D	06/06/2018	16:44	
PDI-SG-S234	K1804093-012	J:\MS20\DATA\060618\0606F019.D	06/06/2018	17:23	

Results flagged with an asterisk (*) indicate the analysis performed outside specified tune window

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Calibration Date:** 11/02/2017

Initial Calibration Summary
Polynuclear Aromatic Hydrocarbons

Calibration ID: CAL15594 **Column:** MS
Instrument ID: MS20

Level ID	File ID	Level ID	File ID
A	J:\MS20\DATA\110217\1102F003.D	G	J:\MS20\DATA\110217\1102F009.D
B	J:\MS20\DATA\110217\1102F004.D	H	J:\MS20\DATA\110217\1102F010.D
C	J:\MS20\DATA\110217\1102F005.D	I	J:\MS20\DATA\110217\1102F011.D
D	J:\MS20\DATA\110217\1102F006.D	J	J:\MS20\DATA\110217\1102F012.D
E	J:\MS20\DATA\110217\1102F007.D		
F	J:\MS20\DATA\110217\1102F008.D		

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
Naphthalene	A	2.0	1.21	B	4.0	1.04	C	8.0	1.03	D	20	0.996	E	100	0.990
	F	200	0.989	G	400	1.02	H	1000	1.01	I	1600	0.972	J	2000	0.967
2-Methylnaphthalene	A	2.0	0.781	B	4.0	0.671	C	8.0	0.661	D	20	0.679	E	100	0.678
	F	200	0.694	G	400	0.692	H	1000	0.678	I	1600	0.645	J	2000	0.644
Acenaphthylene	A	2.0	2.23	B	4.0	1.95	C	8.0	1.92	D	20	1.97	E	100	1.97
	F	200	2.00	G	400	2.07	H	1000	2.08	I	1600	2.05	J	2000	2.02
Acenaphthene	A	2.0	1.45	B	4.0	1.25	C	8.0	1.25	D	20	1.24	E	100	1.21
	F	200	1.22	G	400	1.25	H	1000	1.23	I	1600	1.21	J	2000	1.19
Fluorene	A	2.0	1.81	B	4.0	1.46	C	8.0	1.44	D	20	1.44	E	100	1.46
	F	200	1.47	G	400	1.51	H	1000	1.48	I	1600	1.45	J	2000	1.44
Phenanthrene	A	2.0	1.50	B	4.0	1.16	C	8.0	1.16	D	20	1.16	E	100	1.12
	F	200	1.13	G	400	1.15	H	1000	1.14	I	1600	1.10	J	2000	1.09
Anthracene	A	2.0	1.32	B	4.0	1.05	C	8.0	1.04	D	20	1.03	E	100	1.03
	F	200	1.06	G	400	1.10	H	1000	1.11	I	1600	1.08	J	2000	1.06
Fluoranthene	A	2.0	1.51	B	4.0	1.20	C	8.0	1.19	D	20	1.24	E	100	1.23
	F	200	1.27	G	400	1.32	H	1000	1.30	I	1600	1.25	J	2000	1.24
Pyrene	A	2.0	1.34	B	4.0	1.10	C	8.0	1.09	D	20	1.10	E	100	1.08
	F	200	1.09	G	400	1.12	H	1000	1.13	I	1600	1.12	J	2000	1.11
Benz(a)anthracene	A	2.0	1.36	B	4.0	1.13	C	8.0	1.03	D	20	1.02	E	100	0.986
	F	200	1.01	G	400	1.05	H	1000	1.09	I	1600	1.09	J	2000	1.10
Chrysene	A	2.0	1.26	B	4.0	1.06	C	8.0	1.08	D	20	1.07	E	100	1.06
	F	200	1.06	G	400	1.07	H	1000	1.06	I	1600	1.06	J	2000	1.04
Benzo(b)fluoranthene	A	2.0	1.22	B	4.0	1.06	C	8.0	1.06	D	20	1.10	E	100	1.10
	F	200	1.12	G	400	1.17	H	1000	1.19	I	1600	1.20	J	2000	1.18
Benzo(k)fluoranthene	A	2.0	1.19	B	4.0	1.07	C	8.0	1.09	D	20	1.09	E	100	1.15
	F	200	1.18	G	400	1.20	H	1000	1.19	I	1600	1.19	J	2000	1.18
Benzo(a)pyrene	A	2.0	0.956	B	4.0	0.883	C	8.0	0.866	D	20	0.903	E	100	0.955
	F	200	1.00	G	400	1.06	H	1000	1.06	I	1600	1.08	J	2000	1.08

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Calibration Date:** 11/02/2017

Initial Calibration Summary
Polynuclear Aromatic Hydrocarbons

Calibration ID: CAL15594 **Column:** MS
Instrument ID: MS20

Analyte Name	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF	Level ID	Amt	RRF
Indeno(1,2,3-cd)pyrene	A	2.0	1.05	B	4.0	0.927	C	8.0	0.901	D	20	0.943	E	100	0.987
	F	200	1.03	G	400	1.10	H	1000	1.08	I	1600	1.07	J	2000	1.07
Dibenz(a,h)anthracene	A	2.0	1.02	B	4.0	0.967	C	8.0	0.953	D	20	1.01	E	100	1.05
	F	200	1.08	G	400	1.13	H	1000	1.11	I	1600	1.10	J	2000	1.10
Benzo(g,h,i)perylene	A	2.0	1.36	B	4.0	1.19	C	8.0	1.17	D	20	1.25	E	100	1.21
	F	200	1.23	G	400	1.27	H	1000	1.18	I	1600	1.17	J	2000	1.16
Fluorene-d10				B	4.0	1.51	C	8.0	1.31	D	20	1.26	E	100	1.23
	F	200	1.23	G	400	1.27	H	1000	1.25	I	1600	1.23	J	2000	1.21
Fluoranthene-d10	A	2.0	1.49	B	4.0	1.12	C	8.0	1.07	D	20	1.08	E	100	1.06
	F	200	1.10	G	400	1.15	H	1000	1.17	I	1600	1.16	J	2000	1.15
Terphenyl-d14	A	2.0	1.04	B	4.0	0.848	C	8.0	0.825	D	20	0.837	E	100	0.817
	F	200	0.826	G	400	0.831	H	1000	0.840	I	1600	0.837	J	2000	0.829

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Calibration Date:** 11/02/2017

Initial Calibration Summary
Polynuclear Aromatic Hydrocarbons

Calibration ID: CAL15594 **Column:** MS
Instrument ID: MS20

		Calibration Evaluation					RRF Evaluation		
Analyte Name	**Compound Type**	**Fit Type**	**Eval.**	**Eval. Result**	**Q**	**Control Criteria**	**Average RRF**	**Q**	**Minimum RRF**
Naphthalene	MS	AverageRF	% RSD	6.8		≤ 20	1.02		0.70
2-Methylnaphthalene	MS	AverageRF	% RSD	5.7		≤ 20	0.682		0.40
Acenaphthylene	MS	AverageRF	% RSD	4.4		≤ 20	2.03		0.90
Acenaphthene	MS	AverageRF	% RSD	5.8		≤ 20	1.25		0.90
Fluorene	MS	AverageRF	% RSD	7.5		≤ 20	1.50		0.90
Phenanthrene	MS	AverageRF	% RSD	10.0		≤ 20	1.17		0.70
Anthracene	MS	AverageRF	% RSD	7.9		≤ 20	1.09		0.70
Fluoranthene	MS	AverageRF	% RSD	7.2		≤ 20	1.27		0.60
Pyrene	MS	AverageRF	% RSD	6.7		≤ 20	1.13		0.60
Benz(a)anthracene	MS	AverageRF	% RSD	9.8		≤ 20	1.09		0.80
Chrysene	MS	AverageRF	% RSD	5.7		≤ 20	1.08		0.70
Benzo(b)fluoranthene	MS	AverageRF	% RSD	5.0		≤ 20	1.14		0.70
Benzo(k)fluoranthene	MS	AverageRF	% RSD	4.4		≤ 20	1.15		0.70
Benzo(a)pyrene	MS	AverageRF	% RSD	8.4		≤ 20	0.984		0.70
Indeno(1,2,3-cd)pyrene	MS	AverageRF	% RSD	7.1		≤ 20	1.02		0.50
Dibenz(a,h)anthracene	MS	AverageRF	% RSD	5.9		≤ 20	1.05		0.40
Benzo(g,h,i)perylene	MS	AverageRF	% RSD	5.1		≤ 20	1.22		0.50
Fluorene-d10	SURR	AverageRF	% RSD	7.1		≤ 20	1.28		0.01
Fluoranthene-d10	SURR	AverageRF	% RSD	10.7		≤ 20	1.15		0.01
Terphenyl-d14	SURR	AverageRF	% RSD	7.7		≤ 20	0.853		0.01

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

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

Service Request: K1804093
Calibration Date: 11/02/2017
Date Analyzed: 11/02/2017

Second Source Calibration Verification
Polynuclear Aromatic Hydrocarbons

Calibration Type: Internal Standard
Analysis Method: 8270D SIM

Calibration ID: CAL15594
Units: ng/ml

File ID: J:\MS20\DATA\110217\1102F013.D

Analyte Name	Expected	Result	Average RF	SSV RF	%D	%Drift	Criteria	Curve Fit
Naphthalene	400	360	1.02	0.924	-10	NA	± 30 %	AverageRF
2-Methylnaphthalene	400	380	0.682	0.644	-6	NA	± 30 %	AverageRF
Acenaphthylene	400	380	2.03	1.93	-5	NA	± 30 %	AverageRF
Acenaphthene	400	380	1.25	1.17	-6	NA	± 30 %	AverageRF
Fluorene	400	370	1.50	1.39	-7	NA	± 30 %	AverageRF
Phenanthrene	400	370	1.17	1.08	-8	NA	± 30 %	AverageRF
Anthracene	400	380	1.09	1.03	-6	NA	± 30 %	AverageRF
Fluoranthene	400	400	1.27	1.28	0	NA	± 30 %	AverageRF
Pyrene	400	380	1.13	1.08	-5	NA	± 30 %	AverageRF
Benz(a)anthracene	400	370	1.09	0.996	-8	NA	± 30 %	AverageRF
Chrysene	400	380	1.08	1.03	-5	NA	± 30 %	AverageRF
Benzo(b)fluoranthene	400	380	1.14	1.10	-4	NA	± 30 %	AverageRF
Benzo(k)fluoranthene	400	390	1.15	1.13	-2	NA	± 30 %	AverageRF
Benzo(a)pyrene	400	400	0.984	0.973	-1	NA	± 30 %	AverageRF
Indeno(1,2,3-cd)pyrene	400	370	1.02	0.946	-7	NA	± 30 %	AverageRF
Dibenz(a,h)anthracene	400	380	1.05	1.00	-5	NA	± 30 %	AverageRF
Benzo(g,h,i)perylene	400	360	1.22	1.11	-9	NA	± 30 %	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 06/05/2018

Continuing Calibration Verification Summary
Polynuclear Aromatic Hydrocarbons

Calibration Type: Internal Standard **Calibration Date:** 11/02/2017
Analysis Method: 8270D SIM **Calibration ID:** CAL15594
Analysis Lot: KWG1802888
Units: ng/ml

File ID: J:\MS20\DATA\060518\0605F002.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Naphthalene	400	410	0.70	1.02	1.04	2	NA	± 20	AverageRF
2-Methylnaphthalene	400	430	0.40	0.682	0.726	6	NA	± 20	AverageRF
Acenaphthylene	400	410	0.90	2.03	2.08	3	NA	± 20	AverageRF
Acenaphthene	400	390	0.90	1.25	1.23	-2	NA	± 20	AverageRF
Fluorene	400	410	0.90	1.50	1.52	2	NA	± 20	AverageRF
Phenanthrene	400	390	0.70	1.17	1.13	-3	NA	± 20	AverageRF
Anthracene	400	370	0.70	1.09	1.01	-7	NA	± 20	AverageRF
Fluoranthene	400	420	0.60	1.27	1.35	6	NA	± 20	AverageRF
Pyrene	400	450	0.60	1.13	1.27	12	NA	± 20	AverageRF
Benz(a)anthracene	400	450	0.80	1.09	1.23	13	NA	± 20	AverageRF
Chrysene	400	430	0.70	1.08	1.16	7	NA	± 20	AverageRF
Benzo(b)fluoranthene	400	410	0.70	1.14	1.18	3	NA	± 20	AverageRF
Benzo(k)fluoranthene	400	410	0.70	1.15	1.18	3	NA	± 20	AverageRF
Benzo(a)pyrene	400	440	0.70	0.984	1.08	10	NA	± 20	AverageRF
Indeno(1,2,3-cd)pyrene	400	450	0.50	1.02	1.13	12	NA	± 20	AverageRF
Dibenz(a,h)anthracene	400	440	0.40	1.05	1.17	11	NA	± 20	AverageRF
Benzo(g,h,i)perylene	400	390	0.50	1.22	1.18	-3	NA	± 20	AverageRF
Fluorene-d10	400	420	0.01	1.28	1.33	4	NA	± 20	AverageRF
Fluoranthene-d10	400	440	0.01	1.15	1.27	10	NA	± 20	AverageRF
Terphenyl-d14	400	440	0.01	0.853	0.945	11	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 06/05/2018

Continuing Calibration Verification Summary
Polynuclear Aromatic Hydrocarbons

Calibration Type: Internal Standard **Calibration Date:** 11/02/2017
Analysis Method: 8270D SIM **Calibration ID:** CAL15594
Analysis Lot: KWG1802893
Units: ng/ml

File ID: J:\MS20\DATA\060518\0605F021.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Naphthalene	400	420	0.70	1.02	1.06	4	NA	± 20	AverageRF
2-Methylnaphthalene	400	420	0.40	0.682	0.723	6	NA	± 20	AverageRF
Acenaphthylene	400	410	0.90	2.03	2.06	2	NA	± 20	AverageRF
Acenaphthene	400	390	0.90	1.25	1.22	-2	NA	± 20	AverageRF
Fluorene	400	400	0.90	1.50	1.51	1	NA	± 20	AverageRF
Phenanthrene	400	380	0.70	1.17	1.13	-4	NA	± 20	AverageRF
Anthracene	400	370	0.70	1.09	1.00	-8	NA	± 20	AverageRF
Fluoranthene	400	420	0.60	1.27	1.34	5	NA	± 20	AverageRF
Pyrene	400	450	0.60	1.13	1.26	12	NA	± 20	AverageRF
Benz(a)anthracene	400	460	0.80	1.09	1.24	14	NA	± 20	AverageRF
Chrysene	400	430	0.70	1.08	1.15	7	NA	± 20	AverageRF
Benzo(b)fluoranthene	400	420	0.70	1.14	1.19	4	NA	± 20	AverageRF
Benzo(k)fluoranthene	400	410	0.70	1.15	1.18	3	NA	± 20	AverageRF
Benzo(a)pyrene	400	440	0.70	0.984	1.09	11	NA	± 20	AverageRF
Indeno(1,2,3-cd)pyrene	400	440	0.50	1.02	1.13	11	NA	± 20	AverageRF
Dibenz(a,h)anthracene	400	440	0.40	1.05	1.16	10	NA	± 20	AverageRF
Benzo(g,h,i)perylene	400	390	0.50	1.22	1.19	-2	NA	± 20	AverageRF
Fluorene-d10	400	410	0.01	1.28	1.32	3	NA	± 20	AverageRF
Fluoranthene-d10	400	440	0.01	1.15	1.27	10	NA	± 20	AverageRF
Terphenyl-d14	400	440	0.01	0.853	0.938	10	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335 **Date Analyzed:** 06/06/2018

Continuing Calibration Verification Summary
Polynuclear Aromatic Hydrocarbons

Calibration Type: Internal Standard **Calibration Date:** 11/02/2017
Analysis Method: 8270D SIM **Calibration ID:** CAL15594
Analysis Lot: KWG1802837
Units: ng/ml

File ID: J:\MS20\DATA\060618\0606F002.D

Analyte Name	Expected	Result	Min RF	Average RF	CCV RF	%D	%Drift	Criteria	Curve Fit
Naphthalene	400	420	0.70	1.02	1.07	4	NA	± 20	AverageRF
2-Methylnaphthalene	400	420	0.40	0.682	0.722	6	NA	± 20	AverageRF
Acenaphthylene	400	410	0.90	2.03	2.07	2	NA	± 20	AverageRF
Acenaphthene	400	390	0.90	1.25	1.23	-2	NA	± 20	AverageRF
Fluorene	400	400	0.90	1.50	1.51	1	NA	± 20	AverageRF
Phenanthrene	400	380	0.70	1.17	1.12	-4	NA	± 20	AverageRF
Anthracene	400	370	0.70	1.09	1.00	-8	NA	± 20	AverageRF
Fluoranthene	400	430	0.60	1.27	1.36	6	NA	± 20	AverageRF
Pyrene	400	450	0.60	1.13	1.27	13	NA	± 20	AverageRF
Benz(a)anthracene	400	460	0.80	1.09	1.25	15	NA	± 20	AverageRF
Chrysene	400	430	0.70	1.08	1.18	9	NA	± 20	AverageRF
Benzo(b)fluoranthene	400	420	0.70	1.14	1.20	5	NA	± 20	AverageRF
Benzo(k)fluoranthene	400	410	0.70	1.15	1.17	1	NA	± 20	AverageRF
Benzo(a)pyrene	400	440	0.70	0.984	1.07	9	NA	± 20	AverageRF
Indeno(1,2,3-cd)pyrene	400	440	0.50	1.02	1.13	11	NA	± 20	AverageRF
Dibenz(a,h)anthracene	400	440	0.40	1.05	1.17	11	NA	± 20	AverageRF
Benzo(g,h,i)perylene	400	390	0.50	1.22	1.18	-3	NA	± 20	AverageRF
Fluorene-d10	400	420	0.01	1.28	1.33	4	NA	± 20	AverageRF
Fluoranthene-d10	400	440	0.01	1.15	1.27	10	NA	± 20	AverageRF
Terphenyl-d14	400	440	0.01	0.853	0.945	11	NA	± 20	AverageRF

Results flagged with an asterisk (*) indicate values outside control criteria.

† SPCC Compound **‡ CCC Compound**

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM **Analysis Lot:** KWG1802837
Instrument ID: MS20

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0606F001.D	GC/MS Tuning - Decafluorotriphenylphosph	KWG1802837-1	6/6/2018	05:33		6/6/2018	06:03
0606F002.D	Continuing Calibration Verification	KWG1802837-2	6/6/2018	06:13		6/6/2018	06:42
0606F003.D	ZZZZZZ	ZZZZZZ	6/6/2018	06:52		6/6/2018	07:21
0606F004.D	ZZZZZZ	ZZZZZZ	6/6/2018	07:32		6/6/2018	08:01
0606F005.D	ZZZZZZ	ZZZZZZ	6/6/2018	08:11		6/6/2018	08:40
0606F006.D	ZZZZZZ	ZZZZZZ	6/6/2018	08:51		6/6/2018	09:20
0606F007.D	ZZZZZZ	ZZZZZZ	6/6/2018	09:30		6/6/2018	09:59
0606F008.D	ZZZZZZ	ZZZZZZ	6/6/2018	10:10		6/6/2018	10:39
0606F009.D	ZZZZZZ	ZZZZZZ	6/6/2018	10:49		6/6/2018	11:18
0606F010.D	ZZZZZZ	ZZZZZZ	6/6/2018	11:29		6/6/2018	11:58
0606F011.D	ZZZZZZ	ZZZZZZ	6/6/2018	12:08		6/6/2018	12:37
0606F012.D	ZZZZZZ	ZZZZZZ	6/6/2018	12:47		6/6/2018	13:16
0606F013.D	ZZZZZZ	ZZZZZZ	6/6/2018	13:27		6/6/2018	13:56
0606F014.D	ZZZZZZ	ZZZZZZ	6/6/2018	14:06		6/6/2018	14:35
0606F015.D	ZZZZZZ	ZZZZZZ	6/6/2018	14:46		6/6/2018	15:15
0606F016.D	ZZZZZZ	ZZZZZZ	6/6/2018	15:25		6/6/2018	15:54
0606F017.D	ZZZZZZ	ZZZZZZ	6/6/2018	16:04		6/6/2018	16:33
0606F018.D	PDI-SG-S230	K1804093-011	6/6/2018	16:44		6/6/2018	17:13
0606F019.D	PDI-SG-S234	K1804093-012	6/6/2018	17:23		6/6/2018	17:52

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

ALS Group USA, Corp. dba ALS Environmental

QA/QC Results

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM **Analysis Lot:** KWG1802888
Instrument ID: MS20

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0605F001.D	GC/MS Tuning - Decafluorotriphenylphosph	KWG1802888-1	6/5/2018	08:10		6/5/2018	08:40
0605F002.D	Continuing Calibration Verification	KWG1802888-2	6/5/2018	08:50		6/5/2018	09:19
0605F003.D	Method Blank	KWG1802343-4	6/5/2018	09:29		6/5/2018	09:58
0605F004.D	Lab Control Sample	KWG1802343-3	6/5/2018	10:09		6/5/2018	10:38
0605F005.D	Batch QCMS	KWG1802343-1	6/5/2018	10:48		6/5/2018	11:17
0605F006.D	Batch QCDMS	KWG1802343-2	6/5/2018	11:28		6/5/2018	11:57
0605F007.D	Batch QC	K1804094-003	6/5/2018	12:07		6/5/2018	12:36
0605F008.D	ZZZZZZ	ZZZZZZ	6/5/2018	12:47		6/5/2018	13:16
0605F009.D	ZZZZZZ	ZZZZZZ	6/5/2018	13:26		6/5/2018	13:55
0605F010.D	ZZZZZZ	ZZZZZZ	6/5/2018	14:06		6/5/2018	14:35
0605F011.D	ZZZZZZ	ZZZZZZ	6/5/2018	14:45		6/5/2018	15:14
0605F012.D	ZZZZZZ	ZZZZZZ	6/5/2018	15:25		6/5/2018	15:54
0605F013.D	ZZZZZZ	ZZZZZZ	6/5/2018	16:04		6/5/2018	16:33
0605F014.D	ZZZZZZ	ZZZZZZ	6/5/2018	16:44		6/5/2018	17:13
0605F015.D	ZZZZZZ	ZZZZZZ	6/5/2018	17:24		6/5/2018	17:53
0605F016.D	ZZZZZZ	ZZZZZZ	6/5/2018	18:03		6/5/2018	18:32
0605F017.D	ZZZZZZ	ZZZZZZ	6/5/2018	18:43		6/5/2018	19:12
0605F018.D	ZZZZZZ	ZZZZZZ	6/5/2018	19:22		6/5/2018	19:51
0605F019.D	PDI-SG-S211	K1804093-001	6/5/2018	20:02		6/5/2018	20:31

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Client: AECOM **Service Request:** K1804093
Project: Portland Harbor Pre-Remedial Design Investigation/60566335

Analysis Run Log
Polynuclear Aromatic Hydrocarbons

Analysis Method: 8270D SIM **Analysis Lot:** KWG1802893
Instrument ID: MS20

File ID	Sample Name	Lab Code	Date Analysis Started	Start Time	Q	Date Analysis Finished	Finish Time
0605F020.D	GC/MS Tuning - Decafluorotriphenylphosph	KWG1802893-1	6/5/2018	20:42		6/5/2018	21:12
0605F021.D	Continuing Calibration Verification	KWG1802893-2	6/5/2018	21:21		6/5/2018	21:50
0605F023.D	PDI-SG-S213	K1804093-002	6/5/2018	22:40		6/5/2018	23:09
0605F024.D	PDI-SG-S220	K1804093-003	6/5/2018	23:20		6/5/2018	23:49
0605F025.D	PDI-SG-S215	K1804093-004	6/6/2018	00:00		6/6/2018	00:29
0605F026.D	PDI-SG-S241	K1804093-005	6/6/2018	00:39		6/6/2018	01:08
0605F027.D	PDI-SG-S235	K1804093-006	6/6/2018	01:19		6/6/2018	01:48
0605F028.D	PDI-SG-S238	K1804093-007	6/6/2018	01:58		6/6/2018	02:27
0605F029.D	PDI-SG-S223	K1804093-008	6/6/2018	02:38		6/6/2018	03:07
0605F030.D	PDI-SG-S225	K1804093-009	6/6/2018	03:17		6/6/2018	03:46
0605F031.D	PDI-SG-S231	K1804093-010	6/6/2018	03:57		6/6/2018	04:26
0605F032.D	ZZZZZZ	ZZZZZZ	6/6/2018	04:36		6/6/2018	05:05

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

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

Service Request: K1804093
Date Extracted: 05/09/2018

Extraction Prep Log
Polynuclear Aromatic Hydrocarbons

Extraction Method: EPA 3541
Analysis Method: 8270D SIM

Extraction Lot: KWG1802343
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
PDI-SG-S211	K1804093-001	04/30/18	05/02/18	40.297g	2mL	31.9	
PDI-SG-S213	K1804093-002	04/30/18	05/02/18	40.262g	2mL	30.2	
PDI-SG-S220	K1804093-003	04/30/18	05/02/18	40.262g	2mL	34.5	
PDI-SG-S215	K1804093-004	04/30/18	05/02/18	40.129g	2mL	29.4	
PDI-SG-S241	K1804093-005	05/01/18	05/02/18	40.218g	2mL	39.8	
PDI-SG-S235	K1804093-006	05/01/18	05/02/18	40.207g	2mL	32.2	
PDI-SG-S238	K1804093-007	05/01/18	05/02/18	40.371g	2mL	32.6	
PDI-SG-S223	K1804093-008	05/01/18	05/02/18	40.280g	2mL	41.5	
PDI-SG-S225	K1804093-009	05/01/18	05/02/18	40.204g	2mL	34.8	
PDI-SG-S231	K1804093-010	05/01/18	05/02/18	40.163g	2mL	30.7	
PDI-SG-S230	K1804093-011	05/01/18	05/02/18	40.235g	2mL	31.4	
PDI-SG-S234	K1804093-012	05/01/18	05/02/18	40.227g	2mL	28.9	
Method Blank	KWG1802343-4	NA	NA	40.490g	2mL	NA	
Batch QC	K1804094-003	NA	NA	40.041g	2mL	37.3	
Batch QCMS	KWG1802343-1	NA	NA	40.309g	2mL	37.3	
Batch QCDMS	KWG1802343-2	NA	NA	40.063g	2mL	37.3	
Lab Control Sample	KWG1802343-3	NA	NA	20.000g	2mL	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis