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Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland Harbor Superfund Site Subsurface Sediment – Deep Core Stations
Laboratory:	TestAmerica Laboratories, Incorporated, Seattle, WA
Laboratory Group:	580-79555-1
Analyses/Method:	Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), Total Organic Carbon (TOC), Total Solids, and Grain Size
Validation Level:	Stage 2A
AECOM Project Number:	60566335, Task #2.12
Prepared by: Lynn Sandsor/AECOM	Completed on: December 31, 2018
Reviewed by: Stacy Louie/AECOM	File Name: 580-79555-1 DVR

SUMMARY

The data quality review of 52 subsurface sediment samples and two field blank samples collected on August 10 and August 13, 2018 has been completed. Samples were analyzed for PAHs by EPA Method 8270D modified by selected ion monitoring (SIM), PCBs by EPA Method 8082A, TOC by EPA Method 9060, total solids by American Society for Testing and Materials (ASTM) Method D-2216, moisture content at 70 degrees centigrade (°C), and grain size by ASTM Method D7928/D6913 by TestAmerica Laboratories, Incorporated (TA) located in Tacoma, Washington. Rinsate Blanks were analyzed for PAHs by EPA Method 8270D modified by SIM, PCBs by EPA Method 8082A, and TOC by Standard Method 5310B. The analyses were performed in general accordance with the methods specified in EPA's *Test Methods for Evaluating Solid Waste (SW-846)* and Annual Book of ASTM Standards, American Society for Testing & Materials (ASTM), Philadelphia, Pennsylvania. The laboratory provided level 2 and level 4 data packages containing sample results, and associated quality assurance (QA) and quality control (QC) data, preparation logs, and raw instrument outputs (where applicable). The following samples are associated with laboratory group 580-79555-1:

Sample ID	Laboratory ID
PDI-SC-S230-0to2	580-79555-1
PDI-SC-S230-2to4	580-79555-2
PDI-SC-S230-4to6	580-79555-3
PDI-SC-S230-6to8	580-79555-4
PDI-SC-S230-8to10.0	580-79555-5
PDI-SC-S230-10.0to11.4	580-79555-6
PDI-SC-S007-0to2	580-79555-7
PDI-SC-S007-2to4	580-79555-8
PDI-SC-S007-4to6	580-79555-9
PDI-SC-S007-4to6D (field duplicate)	580-79555-10
PDI-SC-S007-6to8	580-79555-11
PDI-SC-S007-8to10	580-79555-12
PDI-SC-S007-10to12	580-79555-13

Sample ID	Laboratory ID
PDI-SC-S011-0to2	580-79555-29
PDI-SC-S011-2to4	580-79555-30
PDI-SC-S011-4to6	580-79555-31
PDI-SC-S011-6to8	580-79555-32
PDI-SC-S011-8to10	580-79555-33
PDI-SC-S011-10to12	580-79555-34
PDI-SC-S011-12to14.5	580-79555-35
PDI-SC-S011-14.5to16.8	580-79555-36
PDI-SC-S011-14.5to16.8D (field duplicate)	580-79555-37
PDI-SC-S011-16.8to17.9	580-79555-38
PDI-SC-S011-17.9to18.9	580-79555-39
PDI-SC-S004-0to2	580-79555-40
PDI-SC-S004-2to4	580-79555-41

Data Validation Report
Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Subsurface Sediment – Deep Core Stations
TA Lab Group: 580-79555-1

Sample ID	Laboratory ID
PDI-SC-S007-12to14	580-79555-14
PDI-SC-S007-14to16	580-79555-15
PDI-SC-S010-0to2	580-79555-16
PDI-SC-S010-2to4	580-79555-17
PDI-SC-S010-4to6.4	580-79555-18
PDI-SC-S010-6.4to8.4	580-79555-19
PDI-SC-S010-8.4to10.8	580-79555-20
PDI-SC-S010-10.8-13.4	580-79555-21
PDI-SC-S010-13.4to14.4	580-79555-22
PDI-SC-S009-0to2	580-79555-23
PDI-SC-S009-2to4	580-79555-24
PDI-SC-S009-4to6	580-79555-25
PDI-SC-S009-6to8	580-79555-26
PDI-SC-S009-8to10	580-79555-27
PDI-SC-S009-10to11.4	580-79555-28

Sample ID	Laboratory ID
PDI-SC-S004-4to6	580-79555-42
PDI-SC-S004-6to7.3	580-79555-43
PDI-SC-S004-7.3to9.1	580-79555-44
PDI-SC-S004-9.1to10.3	580-79555-45
PDI-SC-S015-0to2	580-79555-46
PDI-SC-S015-2to4	580-79555-47
PDI-SC-S015-4to6	580-79555-48
PDI-SC-S015-6to8	580-79555-49
PDI-SC-S015-8to10	580-79555-50
PDI-SC-S015-10to11.4	580-79555-51
PDI-SC-S015-11.4to12.4	580-79555-52
PDI-RB-SS-180810-1200 (field blank)	580-79555-53
PDI-RB-SS-180810-1730 (field blank)	580-79555-54

Data validation is based on method performance criteria and QC criteria documented in the *Quality Assurance Project Plan (QAPP),* dated March 23, 2018, as amended. If data qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA documents *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017, and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review,* January 2017. Data qualifiers assigned to results reported in this sample set are included in Table 1.

SAMPLE RECEIPT

Upon receipt by TA, the sample jar information was compared to the associated chain-of-custody (COC) and the cooler temperatures were recorded. The coolers were received at temperatures within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C. Seven samples were received and frozen by the Sacramento laboratory and shipped back to the Seattle laboratory on 10/3/2018 to preserve holding times. After samples were thawed, extractions were performed within holding times.

ORGANIC ANALYSES

Samples were analyzed for PAHs and PCBs by the methods identified in the introduction to this report.

1. Holding Times – Acceptable.

2. Initial and Continuing Calibration Verifications – Acceptable except as noted below:

   PCBs by Method 8082A –In the laboratory case narrative, seven CCVs were noted as being recovered outside of acceptance criteria. The laboratory narrative only notes cases where the average CCV %D did not meet the ±20% criteria. As part of this review, all individual CCV

%Ds were reviewed. The following tables summarize the CCV exceedances and qualified data. The first table lists the individual CCV recoveries that did not meet project criteria and the flags, if any, that were applied to the samples; the second table lists all sample results that were qualified due to poor CCV recoveries.

Analytical Batch/CCV ID	Analyte	%D	Affected Samples
285015/CCV-580-285015	PCB-1232 (1C)	low	None. All samples ND and 2C results met criteria.
	PCB-1221 (1C)	high	None. All samples ND.
285017/CCV-580-285017	PCB-1232 (1C)	low	None. All samples ND and 2C results met criteria.
	PCB-1242 (1C)	low	None. All samples ND and 2C results met criteria.
	PCB-1016(1C)	low	None. All samples ND and 2C results met criteria.
	PCB-1260 (1C)	low	None. All samples ND and 2C results met criteria.
	Tetrachloro-m-xylene (1C)	low	None. QC data not qualified based on CCV %D in surrogates.
	Decachlorobiphenyl (ss) (1C and 2C)	low	None. QC data not qualified based on CCV %D in surrogates.
285050/CCV-580-285050	PCB-1232 (1C) and PCB-1232 (2C)	low	Flag all associated sample results (in table below) in Analytical Batch 285050 “UJ” due to low CCV recoveries.
	PCB-1242 (2C)	low	None. All samples ND and 1C results met criteria.
	PCB-1221 (2C)	low	None. All samples ND and 1C results met criteria.
	PCB-1260 (1C)	high	None. Detected results reported from 2C.
285172/CCV-580-28712	PCB-1232 (1C) and PCB-1232 (2C)	low	Flag all associated sample results (in table below) in Analytical Batch 285172 “UJ” due to low CCV recoveries.
	PCB-1248 (2C)	low	None. Results reported from 1C.
	PCB-1260 (1C)	high	None. Detected results reported from 2C.
	PCB-1242 (2C)	low	None. All samples ND and 1C results met criteria.
	PCB-1221 (2C)	low	None. All samples ND and 1C results met criteria.
	PCB-1016 (1C)	high	None. All samples ND.
285151/CCV-580-285151 (RA for PCB-1248 only)	PCB-1248 (2C)	high	None. All samples reported from 1C.
282692/CCV-580-282692	PCB-1242 (2C)	high	None. All samples ND and 1C results met criteria.
	PCB-1254 (2C)	high	None. All samples ND and 1C results met criteria.
	PCB-1260 (2C)	high	None. All samples ND and 1C results met criteria.

(1C) = primary column
(2C) = secondary column
(RA) = reanalysis
(ss) = surrogate spike

Sample ID	Laboratory ID	Analyte	Final Result
PDI-SC-S010-10.8-13.4	580-79555-21	PCB-1232	ND UJ
PDI-SC-S010-13.4to14.4	580-79555-22	PCB-1232	ND UJ
PDI-SC-S009-0to2	580-79555-23	PCB-1232	ND UJ
PDI-SC-S009-2to4	580-79555-24	PCB-1232	ND UJ
PDI-SC-S009-4to6	580-79555-25	PCB-1232	ND UJ
PDI-SC-S009-6to8	580-79555-26	PCB-1232	ND UJ
PDI-SC-S009-8to10	580-79555-27	PCB-1232	ND UJ
PDI-SC-S009-10to11.4	580-79555-28	PCB-1232	ND UJ
PDI-SC-S011-0to2	580-79555-29	PCB-1232	ND UJ
PDI-SC-S011-2to4	580-79555-30	PCB-1232	ND UJ
PDI-SC-S011-4to6	580-79555-31	PCB-1232	ND UJ
PDI-SC-S011-6to8	580-79555-32	PCB-1232	ND UJ
PDI-SC-S011-8to10	580-79555-33	PCB-1232	ND UJ
PDI-SC-S011-10to12	580-79555-34	PCB-1232	ND UJ
PDI-SC-S011-12to14.5	580-79555-35	PCB-1232	ND UJ
PDI-SC-S011-14.5to16.8	580-79555-36	PCB-1232	ND UJ
PDI-SC-S011-14.5to16.8D (field duplicate)	580-79555-37	PCB-1232	ND UJ
PDI-SC-S011-16.8to17.9	580-79555-38	PCB-1232	ND UJ
PDI-SC-S011-17.9to18.9	580-79555-39	PCB-1232	ND UJ
PDI-SC-S004-0to2	580-79555-40	PCB-1232	ND UJ
PDI-SC-S004-2to4	580-79555-41	PCB-1232	ND UJ
PDI-SC-S004-4to6	580-79555-42	PCB-1232	ND UJ
PDI-SC-S004-6to7.3	580-79555-43	PCB-1232	ND UJ
PDI-SC-S004-7.3to9.1	580-79555-44	PCB-1232	ND UJ
PDI-SC-S004-9.1to10.3	580-79555-45	PCB-1232	ND UJ
PDI-SC-S015-0to2	580-79555-46	PCB-1232	ND UJ
PDI-SC-S015-2to4	580-79555-47	PCB-1232	ND UJ
PDI-SC-S015-4to6	580-79555-48	PCB-1232	ND UJ
PDI-SC-S015-6to8	580-79555-49	PCB-1232	ND UJ
PDI-SC-S015-8to10	580-79555-50	PCB-1232	ND UJ
PDI-SC-S015-10to11.4	580-79555-51	PCB-1232	ND UJ
PDI-SC-S015-11.4to12.4	580-79555-52	PCB-1232	ND UJ

3. Blanks – Acceptable except as noted below:

PAHs by Method 8270D-SIM – The following analytes were detected in the method blanks:

Extraction Date	Analyte	Result
8/18/2018	Naphthalene	0.222 J µg/kg
	Phenanthrene	0.204 J µg/kg
8/22/2018	2-Methylnaphthalene	2.66 µg/kg
	Acenaphthylene	2.55 µg/kg
	Acenaphthene	2.23 µg/kg
	Anthracene	2.30 µg/kg
	Benzo[a]anthracene	2.10 µg/kg
	Chrysene	2.49 µg/kg
	Fluoranthene	2.65 µg/kg
	Benzo(b)fluoranthene	1.83 µg/kg
	Fluorene	2.05 µg/kg
	Benzo[k]fluoranthene	2.31 µg/kg
	Benzo[a]pyrene	1.93 µg/kg
	Naphthalene	2.44 µg/kg
	Indeno[1,2,3-cd]pyrene	2.96 µg/kg
	Phenanthrene	2.20 µg/kg
	Dibenz(a,h)anthracene	1.96 µg/kg
	Pyrene	2.34 µg/kg
	Benzo[g,h,i]perylene	2.17 µg/kg
8/23/2018	2-Methylnaphthalene	0.151 J µg/kg
	Naphthalene	0.212.J µg/kg
	Phenanthrene	0.141 J µg/kg

J = reported concentrations were above the MDLs but below the reporting limit
µg/kg = micrograms per kilogram

All 17 compounds detected in the method blank were detected in one or more of the associated project samples. Because all the samples were diluted prior to analysis (5X and 10X), sample results that were flagged by the laboratory as “JB” (detected in associated blank and reported at a concentration less than the RL but greater than the MDL) were flagged as estimated “J” with a reason code of “bl” due to potential high bias due to method blank contamination. The result for dibenz(a,h)anthracene in sample PDI-SC-S004-2TO4 was qualified as not detected (“U”) due to method blank contamination because it was reported at a concentration less than the RL but greater than the MDL and it was less than two times the concentration detected in the method blank. The following results were qualified:

Sample ID	Analyte	Final Result
PDI-SC-S011-0TO2	Dibenz(a,h)anthracene	12 J µg/kg
PDI-SC-S011-0TO2	2-Methylnaphthalene	17 J µg/kg
PDI-SC-S004-2TO4	Dibenz(a,h)anthracene	7.3 U
PDI-SC-S004-4TO6	Phenanthrene	3.8 J µg/kg
PDI-SC-S004-4TO6	Naphthalene	2.2 J µg/kg
PDI-SC-S004-4TO6	2-Methylnaphthalene	0.78 J µg/kg
PDI-SC-S004-6TO7.3	Phenanthrene	1.8 J µg/kg
PDI-SC-S004-6TO7.3	Naphthalene	1.4 J µg/kg
PDI-SC-S004-6TO7.3	2-Methylnaphthalene	0.79 J µg/kg
PDI-SC-S004-7.3TO9.1	Phenanthrene	1.1 J µg/kg
PDI-SC-S004-7.3TO9.1	2-Methylnaphthalene	0.56 J µg/kg
PDI-SC-S004-9.1TO10.3	Phenanthrene	0.84 J µg/kg
PDI-SC-S004-9.1TO10.3	Naphthalene	1.0 J µg/kg
PDI-SC-S004-9.1TO10.3	2-Methylnaphthalene	0.40 J µg/kg

4. Surrogates – Acceptable except as noted below:

PAHs by Method 8270D-SIM – The percent recovery for terphenly-d14 was outside of the control limits of 57-120% in the following samples:

Sample	Surrogate	% Recovery
PDI-SC-S015-0to2	Terphenyl-d14	123%
PDI-SC-S015-2to4	Terphenyl-d14	51%
PDI-SC-S015-10to11.4	Terphenyl-d14	143%

All results in these three samples were qualified as estimated and flagged ‘J’ based on the surrogate spike recoveries.

PCBs by EPA Method 8082A – The percent recoveries for decachlorobiphenyl and tetrachloro-m-xylene in the following samples were outside of the control limits of 54–142% and 58–122%, respectively:

Sample	Surrogate	% Recovery
PDI-SC-S230-0to2	Decachlorobiphenyl	45%
	Tetrachloro-m-xylene	52%
PDI-SC-S230-2to4	Decachlorobiphenyl	52%
	Tetrachloro-m-xylene	50%
PDI-SC-S230-4to6	Tetrachloro-m-xylene	55%
PDI-SC-S230-6to8	Tetrachloro-m-xylene	54%
PDI-SC-S230-8to10	Tetrachloro-m-xylene	52%
PDI-SC-S007-4to6D (field duplicate)	Tetrachloro-m-xylene	56%
PDI-SC-S007-6to8	Decachlorobiphenyl	48%
	Tetrachloro-m-xylene	42%
PDI-SC-S007-8to10	Tetrachloro-m-xylene	57%
PDI-SC-S007-10to12 (1X)	Decachlorobiphenyl	603%
PDI-SC-S007-10to12 (100X) (PCB-1248 only)	Decachlorobiphenyl	0%
	Tetrachloro-m-xylene	0%
PDI-SC-S007-12to14	Tetrachloro-m-xylene	50%
PDI-SC-S007-14to16	Tetrachloro-m-xylene	43%
PDI-SC-S010-2to4	Tetrachloro-m-xylene	46%
PDI-SC-S010-4to6.4	Tetrachloro-m-xylene	47%
PDI-SC-S010-6.4to8.4	Tetrachloro-m-xylene	43%
PDI-SC-S010-8.4to10.8	Tetrachloro-m-xylene	47%
PDI-SC-S009-8to10	Tetrachloro-m-xylene	57%
PDI-SC-S011-6to8	Decachlorobiphenyl	50%
	Tetrachloro-m-xylene	49%
PDI-SC-S011-8to10	Tetrachloro-m-xylene	49%
PDI-SC-S011-10to12	Tetrachloro-m-xylene	46%
PDI-SC-S011-12to14.5	Decachlorobiphenyl	53%
	Tetrachloro-m-xylene	41%
PDI-SC-S011-14.6to16.8 (1X)	Tetrachloro-m-xylene	50%
PDI-SC-S011-14.6to16.8 (10X)	Tetrachloro-m-xylene	54%
PDI-SC-S011-17.9to18.9	Tetrachloro-m-xylene	28%
PDI-SC-S004-0to2	Tetrachloro-m-xylene	48%
PDI-SC-S004-2to4	Decachlorobiphenyl	53%
	Tetrachloro-m-xylene	56%
PDI-SC-S015-4to6	Decachlorobiphenyl	47%
	Tetrachloro-m-xylene	50%
PDI-SC-S015-6to8	Tetrachloro-m-xylene	28%
PDI-SC-S015-8to10	Tetrachloro-m-xylene	50%
PDI-SC-S015-10to11.4	Tetrachloro-m-xylene	52%
PDI-SC-S015-11.4to12.4	Tetrachloro-m-xylene	56%

The PCB results in samples where both surrogate spike recoveries did not meet project criteria (shaded grey) were qualified as estimated and flagged ‘J’ or ‘UJ’ based on the

surrogate spike recoveries. However, the result for PDI-SC-007-10to12 (100X) was not qualified because the surrogate spike was diluted out.

5. Laboratory Control Sample – Acceptable except as noted below:

PAHs by Method 8270D-SIM – The percent recoveries in the LCS were outside of the control limits in the LCS prepared on October 6, 2018:

Analyte	LCS	LCSD	RPD	LCS Control Limits
Acenaphthylene	66%	NA	NC	68–120%

NA = not analyzed
NC = not calculated

The following sample results for acenaphthylene were qualified as estimated and flagged 'J' based on the LCS recovery: PDI-SC-S015-0TO2, PDI-SC-S015-2TO4, PDI-SC-S015-4TO6, PDI-SC-S015-6TO8, PDI-SC-S015-8TO10, PDI-SC-S015-10TO11.4, and PDI-SC-S015-11.4TO12.4.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable for the MS/MSD analyzed on PDI-SC-S230-6to8. The following MS/MSD criteria were not as noted below:

PAHs by Method 8270D-SIM – For the MS/MSD performed on sample PDI-SC-S011-16.8to17.9, the percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
2-Methylnaphthalene	ok	ok	17%	68–120%/12
Acenaphthylene	ok	ok	13%	68–120%/12
Acenaphthene	64%	ok	18%	68–120%/12
Anthracene	60%	ok	14%	73–125%/12
Benzo[a]anthracene	20%	32	ok	66–120%/14
Chrysene	6%	17	ok	69–120%/10
Fluoranthene	-2%	35%	18%	74–125%/13
Benzo(b)fluoranthene	12%	27%	11%	63–121%/10
Fluorene	ok	ok	15%	73–120%/13
Benzo[k]fluoranthene	51%	57%	ok	63–123%/15
Benzo[a]pyrene	8%	21%	ok	72–124%/12
Naphthalene	57%	ok	19%	70–120%/12
Indeno[1,2,3-cd]pyrene	23%	33%	ok	65–121%/15
Phenanthrene	38%	ok	29%	73–120%/11
Pyrene	-27%	11%	17%	70–120%/12
Benzo[g,h,i]perylene	39%	52%	ok	63–120%/14

ok = acceptable

As two of the three quality control parameters (MS, MSD, and RPD) were acceptable for 2-methylnaphthalene, acenaphthylene, and fluorene, these data were not qualified. The results for acenaphthene, anthracene, benzo[a]anthracene, chrysene, fluoranthene, benzo(b)fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, naphthalene, indeno[1,2,3-

cd]pyrene, phenanthrene, pyrene and benzo[g,h,i] perylene were qualified as estimated and flagged 'J' in sample PDI-SC-S011-16.8to17.9 based on the MS/MSD results.

For the MS/MSD performed on sample PDI-SC-S009-6to8, the percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
Benzo[a]pyrene	70%	ok	ok	72–124%/12

ok = acceptable

As two of the three quality control parameters (MS, MSD, and RPD) were acceptable for benzo[a]pyrene, this data was not qualified.

For the MS/MSD performed on sample PDI-SC-S015-2to4, the percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
2-Methylnaphthalene	127%	ok	47%	68–120%/12
Anthracene	ok	ok	13%	73–125%/12
Benzo[g,h,i]perylene	ok	ok	22%	63–120%/14
Dibenz(a,h)anthracene	ok	ok	17%	70–125%/13
Indeno[1,2,3-cd]pyrene	ok	136%	17%	65–121%/15
Pyrene	226%	121%	51%	70–120%/12
Acenaphthene (RA)	124%	ok	36%	68–120%/12
Benzo(b)fluoranthene (RA)	44%	ok	47%	63–121%/10
Benzo[k]fluoranthene (RA)	61%	ok	43%	63–123%/15
Fluoranthene (RA)	136%	45%	55%	74–125%/13

ok = acceptable
RA = reanalysis

As two of the three quality control parameters (MS, MSD, and RPD) were acceptable for anthracene, benzo[g,h,i]perylene and dibenz(a,h)anthracene, these data were not qualified. The results for 2-methylnaphthalene, indeno[1,2,3-cd]pyrene, pyrene, acenaphthene, benzo[b]fluoranthene, benzo[k]fluoranthene, and fluoranthene were qualified as estimated and flagged 'J' in sample PDI-SC-S015-2to4 based on the MS/MSD results.

PCBs by EPA Method 8082A – An MS/MSD was performed using PDI-SC-S230-6to8. The percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
PCB-1016	212%	231%	ok	64–120%/21
PCB-1260	-28%	16%	ok	63–130%/25

ok = acceptable

The result for PCB-1016 was not qualified as estimated based on the high matrix spike recovery because the result was not detected. The result for PCB-1260 was qualified as estimated and flagged 'J' in PDI-SC-S230-6to8 based on the MS/MSD results.

An MS/MSD was performed using PDI-SC-S015-2to4. The percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
PCB-1016	57%	ok	ok	64–120%/21
PCB-1260	43%	40%	ok	63–130%/25

ok = acceptable

As two of the three quality control parameters (MS, MSD, and RPD) were acceptable for PCB-1016, this data was not qualified. The result for PCB-1260 was qualified as estimated and flagged 'J' in PDI-SC-S015-2to4 based on the MS/MSD results.

7. Field Duplicate – Two field duplicates were collected for analyses (PDI-SC-S007-4to6 / PDI-SC-S007-4to6D and PDI-SC-S011-14.5to16.8/ PDI-SC-S011-14.5to16.8D). All RPDs met project criteria.

8. Reporting Limits and Chromatographic Review – Acceptable except as noted below:

   General – One or more results were flagged 'J' by the laboratory to indicate the reported concentrations were above the MDLs but below the reporting limits. Laboratory 'J'-flagged results are considered estimated. As the result is between the MDL and the reporting limit, there is a greater level of uncertainty associated with the numerical result.

   PAHs by Method 8270D-SIM – Several samples required dilution prior to analysis due to the nature of the sample matrix.

   PCBs by EPA Method 8082A – Chromatograms were reviewed to confirm target analytes were properly identified. The review confirmed target analytes were properly identified and reported by the laboratory.

9. Other Items of Note:

   PCBs by EPA Method 8082A – All but two samples and the associated MS/MSDs required a copper clean-up to reduce matrix interferences caused by sulfur.

   The % RPD between the primary and confirmation column exceeded 40% for PCB-1248 for the following samples: PDI-SC-S009-6to8, PDI-SC-S009-8to10, PDI-SC-S009-10to11.4, PDI-SC-S011-0to2, PDI-SC-S011-2to4, PDI-SC-S011-4to6, PDI-SC-S011-6to8, and PDI-SC-S011-8to10. The lower values have been reported and qualified in accordance with the laboratory's SOP. The results are qualified as estimated with a reason code of "r".

   PAHs by Method 8270D-SIM – The laboratory case narrative noted that the incorrect reference spectra was used for fluoranthene in 32 sample analyses. The correct spectra for all of those samples was reviewed and found to be acceptable.

CONVENTIONAL ANALYSES

Samples were analyzed for TOC, grain size, and total solids by the methods identified in the introduction to this report.

1. Holding Times – Acceptable except as noted below:

   Moisture Content at 70°C – The 7-day holding time indicated for total solids in the QAPP was exceeded for all samples in the laboratory group. No data qualifiers were assigned based on the holding time exceedances.

2. Blanks – Acceptable except as noted below.

   TOC by Method by Method SW9060 – TOC was reported in both of the field blanks at concentrations less than the RL (0.26 J mg/L and 0.24 J mg/L). Data are not qualified based on field blank contamination.

   TOC was also reported in the method blank (318 J mg/kg) for Batch 282530. No sample results are qualified because only QC samples were analyzed in this batch.

3. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable.

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable.

   TOC by Method by Method SW9060 – MS/MSDs were performed using PDI-SC-S230-6to8, PDI-SC-S004-2to4, PDI-SC-S009-6to8, and PDI-SC-S015-2to4. Results were acceptable.

5. Field Duplicate – Two field duplicates were collected for TOC analyses (PDI-SC-S007-4to6 / PDI-SC-S007-4to6D and PDI-SC-S011-14.5to16.8/ PDI-SC-S011-14.5to16.8D). All RPDs met project criteria.

6. Laboratory Replicate – Acceptable.

   TOC by Method by Method SW9060 – Laboratory duplicate and triplicate analyses were performed using PDI-SC-S230-6to8, PDI-SC-S004-2to4, PDI-SC-S009-6to8, and PDI-SC-S015-2to4. Results were comparable.

   ASTM D-2216 – Laboratory duplicate analyses were performed using PDI-SC-S230-0to2, PDI-SC-S011-8to10, and PDI-SC-S011-10to12. Results were comparable.

   Moisture Content at 70°C – Laboratory duplicate analyses were performed using PDI-SC-S230-0to2, PDI-SC-S007-10to12, PDI-SC-S010-8.4to10.8, and PDI-SC-S007-4to6D. Results were comparable.

7. Reporting Limits – Acceptable.

8. Other Items of Note:

   The laboratory case narrative was incomplete. The case narratives for TOC (rinse blanks), grain size, and total solids were omitted.

GRAIN SIZE ANALYSES

Samples were analyzed for grain size by the methods identified in the introduction to this report. The data were reviewed to confirm that the required grain size fractions identified in the QAPP were reported for each sample.

1. Laboratory Duplicate – Acceptable except as noted below:

   The laboratory performed duplicate analysis at a rate of 1 per 20 samples per their internal requirements. Three laboratory duplicate analyses were performed. Results were within the project limits of 20%, with the exceptions noted below. Sample results for PDI-SC-S230-0to2 and PDI-SC-S010-8.4to10.8 are qualified "L" to indicate that the grain size fraction was greater than 5 percent of the total combined fractions and the RPD for the duplicate analysis on the sample fraction was greater than 20%. However, coarse sand in PDI-SC-S007-10to12 is not qualified because the grain size fraction is less than 5%.

Sample ID	Analyte	RPD
PDI-SC-S230-0TO2	Sand, Fine	68%
PDI-SC-S007-10TO12	Sand, Coarse	111%
PDI-SC-S010-8.4TO10.8	Clay	21%

OVERALL ASSESSMENT OF DATA

The data reported in this laboratory group is considered usable for meeting project objectives. The completeness for laboratory group 580-79555-1 is 100%.

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79555-1

Sample ID	Laboratory Sample ID	Method	Analyte	Result	Units	Final Result	Reason Code
PDI-SC-S230-0TO2	580-79555-1	D7928/D6913	Sand, Fine	11.0	%	11.0 L	ld
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1260	13	µg/kg	13 J	s
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1254	4.6 U	µg/kg	4.6 UJ	s
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1221	4.6 U	µg/kg	4.6 UJ	s
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1232	4.6 U	µg/kg	4.6 UJ	s
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1248	4.6 U	µg/kg	4.6 UJ	s
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1016	4.6 U	µg/kg	4.6 UJ	s
PDI-SC-S230-0TO2	580-79555-1	SW8082A	Aroclor 1242	4.6 U	µg/kg	4.6 UJ	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1260	27	µg/kg	27 J	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1254	4.1 U	µg/kg	4.1 UJ	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1221	4.1 U	µg/kg	4.1 UJ	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1232	4.1 U	µg/kg	4.1 UJ	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1248	4.1 U	µg/kg	4.1 UJ	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1016	4.1 U	µg/kg	4.1 UJ	s
PDI-SC-S230-2TO4	580-79555-2	SW8082A	Aroclor 1242	4.1 U	µg/kg	4.1 UJ	s
PDI-SC-S230-6TO8	580-79555-4	SW8082A	Aroclor 1260	45	µg/kg	45 J	m
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1260	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1254	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1221	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1232	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1248	31	µg/kg	31 J	s
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1016	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S007-6TO8	580-79555-11	SW8082A	Aroclor 1242	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S010-8.4TO10.8	580-79555-20	D7928/D6913	Clay	5.3	%	5.3 L	ld
PDI-SC-S010-10.8TO13.4	580-79555-21	SW8082A	Aroclor 1232	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S010-13.4TO14.4	580-79555-22	SW8082A	Aroclor 1232	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S009-0TO2	580-79555-23	SW8082A	Aroclor 1232	4.3 U	µg/kg	4.3 UJ	c
PDI-SC-S009-2TO4	580-79555-24	SW8082A	Aroclor 1232	4.5 U	µg/kg	4.5 UJ	c
PDI-SC-S009-4TO6	580-79555-25	SW8082A	Aroclor 1232	4.3 U	µg/kg	4.3 UJ	c
PDI-SC-S009-6TO8	580-79555-26	SW8082A	Aroclor 1232	4.0 U	µg/kg	4.0 UJ	c
PDI-SC-S009-6TO8	580-79555-26	SW8082A	Aroclor 1248	2.5 J	µg/kg	2.5 J	r
PDI-SC-S009-8TO10	580-79555-27	SW8082A	Aroclor 1232	3.6 U	µg/kg	3.6 UJ	c
PDI-SC-S009-8TO10	580-79555-27	SW8082A	Aroclor 1248	11	µg/kg	11 J	r

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79555-1

Sample ID	Laboratory Sample ID	Method	Analyte	Result	Units	Final Result	Reason Code
PDI-SC-S009-10TO11.4	580-79555-28	SW8082A	Aroclor 1232	3.7 U	µg/kg	3.7 UJ	c
PDI-SC-S009-10TO11.4	580-79555-28	SW8082A	Aroclor 1248	7.6	µg/kg	7.6 J	r
PDI-SC-S011-0TO2	580-79555-29	SW8082A	Aroclor 1232	4.6 U	µg/kg	4.6 UJ	c
PDI-SC-S011-0TO2	580-79555-29	SW8082A	Aroclor 1248	3.3 J	µg/kg	3.3 J	r
PDI-SC-S011-0TO2	580-79555-29	SW8270DSIM	Dibenz(a,h)anthracene	12 J	µg/kg	12 J	bl
PDI-SC-S011-0TO2	580-79555-29	SW8270DSIM	2-Methylnaphthalene	17 J	µg/kg	17 J	bl
PDI-SC-S011-2TO4	580-79555-30	SW8082A	Aroclor 1232	3.6 U	µg/kg	3.6 UJ	c
PDI-SC-S011-2TO4	580-79555-30	SW8082A	Aroclor 1248	6.6	µg/kg	6.6 J	r
PDI-SC-S011-4TO6	580-79555-31	SW8082A	Aroclor 1232	3.7 U	µg/kg	3.7 UJ	c
PDI-SC-S011-4TO6	580-79555-31	SW8082A	Aroclor 1248	4.6	µg/kg	4.6 J	r
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1260	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1254	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1221	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1232	3.8 U	µg/kg	3.8 UJ	s,c
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1016	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1242	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S011-6TO8	580-79555-32	SW8082A	Aroclor 1248	7.9	µg/kg	7.9 J	s,r
PDI-SC-S011-8TO10	580-79555-33	SW8082A	Aroclor 1232	3.5 U	µg/kg	3.5 UJ	c
PDI-SC-S011-8TO10	580-79555-33	SW8082A	Aroclor 1248	13	µg/kg	13 J	r
PDI-SC-S011-10TO12	580-79555-34	SW8082A	Aroclor 1232	3.4 U	µg/kg	3.4 UJ	c
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1260	3.2 U	µg/kg	3.2 UJ	s
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1254	3.2 U	µg/kg	3.2 UJ	s
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1221	3.2 U	µg/kg	3.2 UJ	s
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1232	3.2 U	µg/kg	3.2 UJ	s,c
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1248	97	µg/kg	97 J	s
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1016	3.2 U	µg/kg	3.2 UJ	s
PDI-SC-S011-12TO14.5	580-79555-35	SW8082A	Aroclor 1242	3.2 U	µg/kg	3.2 UJ	s
PDI-SC-S011-14.5TO16.8	580-79555-36	SW8082A	Aroclor 1232	3.4 U	µg/kg	3.4 UJ	c
PDI-SC-S011-14.5TO16.8D	580-79555-37	SW8082A	Aroclor 1232	33 U	µg/kg	33 UJ	c
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8082A	Aroclor 1232	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Anthracene	150	µg/kg	150 J	m,md
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Pyrene	660	µg/kg	660 J	m,md
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Benzo(g,h,i)perylene	160	µg/kg	160 J	m

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79555-1

Sample ID	Laboratory Sample ID	Method	Analyte	Result	Units	Final Result	Reason Code
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Indeno(1,2,3-cd)pyrene	190	µg/kg	190 J	m
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Benzo(b)fluoranthene	280	µg/kg	280 J	m,md
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Fluoranthene	510	µg/kg	510 J	m,md
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Benzo(k)fluoranthene	80	µg/kg	80 J	m
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Chrysene	270	µg/kg	270 J	m
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Benzo(a)pyrene	250	µg/kg	250 J	m
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Benz(a)anthracene	290	µg/kg	290 J	m
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Acenaphthene	130	µg/kg	130 J	m,md
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Phenanthrene	440	µg/kg	440 J	m,md
PDI-SC-S011-16.8TO17.9	580-79555-38	SW8270DSIM	Naphthalene	280	µg/kg	280 J	m,md
PDI-SC-S011-17.9TO18.9	580-79555-39	SW8082A	Aroclor 1232	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S004-0TO2	580-79555-40	SW8082A	Aroclor 1232	3.3 U	µg/kg	3.3 UJ	c
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1254	3.0 U	µg/kg	3.0 UJ	s
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1221	3.0 U	µg/kg	3.0 UJ	s
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1232	3.0 U	µg/kg	3.0 UJ	s,c
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1016	3.0 U	µg/kg	3.0 UJ	s
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1242	3.0 U	µg/kg	3.0 UJ	s
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1260	3.0 U	µg/kg	3.0 UJ	s
PDI-SC-S004-2TO4	580-79555-41	SW8082A	Aroclor 1248	3.0 U	µg/kg	3.0 UJ	s
PDI-SC-S004-2TO4	580-79555-41	SW8270DSIM	Dibenz(a,h)anthracene	3.2 J	µg/kg	7.3 U	bl
PDI-SC-S004-4TO6	580-79555-42	SW8082A	Aroclor 1232	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S004-4TO6	580-79555-42	SW8270DSIM	Phenanthrene	3.8 J	µg/kg	3.8 J	bl
PDI-SC-S004-4TO6	580-79555-42	SW8270DSIM	Naphthalene	2.2 J	µg/kg	2.2 J	bl
PDI-SC-S004-4TO6	580-79555-42	SW8270DSIM	2-Methylnaphthalene	0.78 J	µg/kg	0.78 J	bl
PDI-SC-S004-6TO7.3	580-79555-43	SW8082A	Aroclor 1232	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S004-6TO7.3	580-79555-43	SW8270DSIM	Phenanthrene	1.8 J	µg/kg	1.8 J	bl
PDI-SC-S004-6TO7.3	580-79555-43	SW8270DSIM	Naphthalene	1.4 J	µg/kg	1.4 J	bl
PDI-SC-S004-6TO7.3	580-79555-43	SW8270DSIM	2-Methylnaphthalene	0.79 J	µg/kg	0.79 J	bl
PDI-SC-S004-7.3TO9.1	580-79555-44	SW8082A	Aroclor 1232	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S004-7.3TO9.1	580-79555-44	SW8270DSIM	Phenanthrene	1.1 J	µg/kg	1.1 J	bl
PDI-SC-S004-7.3TO9.1	580-79555-44	SW8270DSIM	2-Methylnaphthalene	0.56 J	µg/kg	0.56 J	bl
PDI-SC-S004-9.1TO10.3	580-79555-45	SW8082A	Aroclor 1232	2.6 U	µg/kg	2.6 UJ	c
PDI-SC-S004-9.1TO10.3	580-79555-45	SW8270DSIM	Phenanthrene	0.84 J	µg/kg	0.84 J	bl

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79555-1

Sample ID	Laboratory Sample ID	Method	Analyte	Result	Units	Final Result	Reason Code
PDI-SC-S004-9.1TO10.3	580-79555-45	SW8270DSIM	Naphthalene	1.0 J	µg/kg	1.0 J	bl
PDI-SC-S004-9.1TO10.3	580-79555-45	SW8270DSIM	2-Methylnaphthalene	0.40 J	µg/kg	0.40 J	bl
PDI-SC-S015-0TO2	580-79555-46	SW8082A	Aroclor 1232	4.4 U	µg/kg	4.4 UJ	c
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Anthracene	70	µg/kg	70 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Pyrene	380	µg/kg	380 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Benzo(g,h,i)perylene	89	µg/kg	89 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Indeno(1,2,3-cd)pyrene	89	µg/kg	89 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Chrysene	130	µg/kg	130 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Benzo(a)pyrene	89	µg/kg	89 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Dibenz(a,h)anthracene	14 J	µg/kg	14 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Benz(a)anthracene	97	µg/kg	97 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Phenanthrene	140	µg/kg	140 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Naphthalene	44	µg/kg	44 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	2-Methylnaphthalene	13 J	µg/kg	13 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Acenaphthylene	17 J	µg/kg	17 J	l,s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Acenaphthene	20 J	µg/kg	20 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Benzo(b)fluoranthene	87	µg/kg	87 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Benzo(k)fluoranthene	27	µg/kg	27 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Fluoranthene	210	µg/kg	210 J	s
PDI-SC-S015-0TO2	580-79555-46	SW8270DSIM	Fluorene	28	µg/kg	28 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8082A	Aroclor 1232	3.8 U	µg/kg	3.8 UJ	c
PDI-SC-S015-2TO4	580-79555-47	SW8082A	Aroclor 1260	2.4 J	µg/kg	2.4 J	m
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Anthracene	40	µg/kg	40 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Pyrene	150	µg/kg	150 J	m,md,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Benzo(g,h,i)perylene	54	µg/kg	54 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Indeno(1,2,3-cd)pyrene	56	µg/kg	56 J	m,md,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Chrysene	100	µg/kg	100 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Benzo(a)pyrene	100	µg/kg	100 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Dibenz(a,h)anthracene	8.6 J	µg/kg	8.6 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Benz(a)anthracene	75	µg/kg	75 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Phenanthrene	130	µg/kg	130 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Naphthalene	40	µg/kg	40 J	s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	2-Methylnaphthalene	11 J	µg/kg	11 J	m,md,s

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79555-1

Sample ID	Laboratory Sample ID	Method	Analyte	Result	Units	Final Result	Reason Code
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Benzo(b)fluoranthene	120	µg/kg	120 J	m,md,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Fluoranthene	280	µg/kg	280 J	m,md,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Benzo(k)fluoranthene	35	µg/kg	35 J	m,md,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Acenaphthylene	15 J	µg/kg	15 J	l,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Acenaphthene	25	µg/kg	25 J	m,md,s
PDI-SC-S015-2TO4	580-79555-47	SW8270DSIM	Fluorene	32	µg/kg	32 J	s
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1260	3.6 U	µg/kg	3.6 UJ	s
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1254	3.6 U	µg/kg	3.6 UJ	s
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1221	3.6 U	µg/kg	3.6 UJ	s
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1232	3.6 U	µg/kg	3.6 UJ	s,c
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1248	4.5	µg/kg	4.5 J	s
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1016	3.6 U	µg/kg	3.6 UJ	s
PDI-SC-S015-4TO6	580-79555-48	SW8082A	Aroclor 1242	3.6 U	µg/kg	3.6 UJ	s
PDI-SC-S015-4TO6	580-79555-48	SW8270DSIM	Acenaphthylene	31	µg/kg	31 J	l
PDI-SC-S015-6TO8	580-79555-49	SW8082A	Aroclor 1232	3.5 U	µg/kg	3.5 UJ	c
PDI-SC-S015-6TO8	580-79555-49	SW8270DSIM	Acenaphthylene	33	µg/kg	33 J	l
PDI-SC-S015-8TO10	580-79555-50	SW8082A	Aroclor 1232	3.4 U	µg/kg	3.4 UJ	c
PDI-SC-S015-8TO10	580-79555-50	SW8270DSIM	Acenaphthylene	35	µg/kg	35 J	l
PDI-SC-S015-10TO11.4	580-79555-51	SW8082A	Aroclor 1232	3.4 U	µg/kg	3.4 UJ	c
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Anthracene	220	µg/kg	220 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Pyrene	1400	µg/kg	1400 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Benzo(g,h,i)perylene	180	µg/kg	180 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Indeno(1,2,3-cd)pyrene	190	µg/kg	190 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Chrysene	330	µg/kg	330 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Benzo(a)pyrene	330	µg/kg	330 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Dibenz(a,h)anthracene	28	µg/kg	28 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Benz(a)anthracene	290	µg/kg	290 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Phenanthrene	1100	µg/kg	1100 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Naphthalene	200	µg/kg	200 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	2-Methylnaphthalene	130	µg/kg	130 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Acenaphthylene	32	µg/kg	32 J	l.s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Acenaphthene	290	µg/kg	290 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Benzo(b)fluoranthene	300	µg/kg	300 J	s

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79555-1

Sample ID	Laboratory Sample ID	Method	Analyte	Result	Units	Final Result	Reason Code
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Benzo(k)fluoranthene	110	µg/kg	110 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Fluoranthene	760	µg/kg	760 J	s
PDI-SC-S015-10TO11.4	580-79555-51	SW8270DSIM	Fluorene	260	µg/kg	260 J	s
PDI-SC-S015-11.4TO12.4	580-79555-52	SW8270DSIM	Acenaphthylene	63	µg/kg	63 J	l
PDI-SC-S015-11.4TO12.4	580-79555-52	SW8082A	PCB 1232	3.1 U	µg/kg	3.1 UJ	c

µg/kg = micrograms per kilogram
bl = blank contamination
c = calibration issue
ID = identification
J = estimated concentration
l = laboratory control sample recovery
L = the grain size fraction was greater than 5 percent of total combined fractions and the RPD for duplicate analysis was greater than 20%
ld = laboratory duplicate relative percent difference
m = matrix spike recovery
md = matrix spike/matrix spike duplicate relative percent difference
r = dual column relative percent difference
s = surrogate spike recovery
U = not detected
UJ = estimated reporting limit