AECOM
1111 3rd Ave
Suite 1600
Seattle, WA 98101
www.aecom.com

206 438 2700 tel
866 495 5288 fax

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:	580-79329-1	
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: 580-79329-1 DVR

SUMMARY

The data quality review of 39 subsurface sediment samples (including two field duplicates) and three rinsate blanks samples collected on August 1, 2, and 3, 2018 has been completed. Field samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) by U.S. Environmental Protection Agency (EPA) Method 8270D modified by selected ion monitoring (SIM), polychlorinated biphenyls (PCBs) by EPA Method 8082A, total organic carbon (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 selected ion monitoring (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, 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 580-79329-1:

Sample ID	Laboratory ID
PDI-SC-S144-0to2	580-79329-1
PDI-SC-S144-2to 4	580-79329-2
PDI-SC-S144-4to6	580-79328-3
PDI-SC-S144-6to8	580-79329-4
PDI-SC-S144-8to10	580-79329-5
PDI-SC-S144-10to12.1	580-79329-6
PDI-SC-S086-0to2	580-79329-7
PDI-SC-S086-0to2D	580-79329-8
PDI-SC-S086-2to3.3	580-79329-9
PDI-SC-S218-0to2	580-79329-10
PDI-SC-S218-2to4.5	580-79329-11
PDI-SC-S218-4.5to6	580-79329-12

Sample ID	Laboratory ID
PDI-SC-S178-8.7to10.7	580-79329-22
PDI-SC-S178-10.7to12.7	580-79329-23
PDI-SC-S178-12.7to14	580-79329-24
PDI-SC-S083-0to1.6	580-79329-25
PDI-SC-S083-1.6to3.5	580-79329-26
PDI-SC-S083-3.5to5.0	580-79329-27
PDI-SC-S083-5to6.6	580-79329-28
PDI-SC-S032-0to2	580-79329-29
PDI-SC-S032-2to4	580-79329-30
PDI-SC-S032-4to6	580-79329-31
PDI-SC-S032-6to8	580-79329-32
PDI-SC-S032-8to10	580-79329-33

Data Validation Report
Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Subsurface Sediment – Deep Core Stations
TA Lab Group: 580-79329-1

Sample ID	Laboratory ID
PDI-SC-S172-2to4	580-79329-13
PDI-SC-S172-2to4D	580-79329-14
PDI-SC-S172-4to6	580-79329-15
PDI-SC-S172-6to8.1	580-79329-16
PDI-SC-S178-0to2	580-79329-17
PDI-SC-S178-2to3.7	580-79329-18
PDI-SC-S178-3.7-4.7	580-79329-19
PDI-SC-S178-4.7to6.7	580-79329-20
PDI-SC-S178-6.7-8.7	580-79329-21

Sample ID	Laboratory ID
PDI-SC-S032-10to12	580-79329-34
PDI-SC-S032-12to14	580-79329-35
PDI-SC-S172-0to2	580-79329-36
PDI-SC-S218-6to8	580-79329-37
PDI-SC-S218-8to10	580-79329-38
PDI-SC-S228-0to2.3	580-79329-39
PDI-RB-SS-180801	580-79329-44
PDI-RB-SS-180802-1645	580-79329-45
PDI-RB-SS-180802	580-79329-46

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.

ORGANIC ANALYSES

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

1. Holding Times – Acceptable except as noted below:
   PAHs by Method 8270D-SIM – The initial sample analyses for samples PDI-SC-S172-0to2, PDI-SC-S218-6to8, PDI-SC-S218-8to10, and PDI-SC-S228-0to2.3 were deemed unusable by the laboratory due to “failure of quality control parameters.” All 17 analytes in these four samples were re-extracted out of holding time. The results from the initial analyses were flagged 'DNR' for Do Not Report and the results from the re-extracted samples are reported. All results for these samples are qualified as estimated and flagged ‘UJ’ or ’J’ due to holding time exceedances.

2. Initial and Continuing Calibration Verifications – Acceptable except as noted below:
   PCBs by Method 8082A – The percent difference (%D) for the following analytes were recovered outside the control limits of ±20% for individual peaks in the continuing calibration verifications (CCVs) associated with the analytical batches below:

Data Validation Report
Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Subsurface Sediment – Deep Core Stations
TA Lab Group: 580-79329-1

Analytical Batch	Analyte	Column 1C %D	Column 2C %D
281188	PCB-1248	ok	low
	PCB-1242	high	high
	PCB-1221	high	high
	PCB-1016	low	low
	PCB-1260	ok	low
281265	PCB-1232	high	high
	PCB-1248	high	low
	PCB-1242	high	high/low
	PCB-1221	high	high/low
	PCB-1254	high	ok
	PCB-1016	high	low
	PCB-1260	ok	low
281266	PCB-1232	high	high
	PCB-1248	high	low
	PCB-1242	low	high
	PCB-1221	high	high/low
	PCB-1254	high	ok
	PCB-1016	high	ok
	PCB-1260	ok	low
281357	PCB-1232	high	ok
	PCB-1248	high	low
	PCB-1242	high	high
	PCB-1221	high	high/low
	PCB-1254	high	ok
	PCB-1016	high	high
	PCB-1260	high	ok
281788	PCB-1232	high	ok
	PCB-1248	high	high/low
	PCB-1242	ok	ok
	PCB-1221	ok	high/low
	PCB-1254	ok	ok
	PCB-1016	ok	low
	PCB-1260	low	low
281924	PCB-1232	high	high
	PCB-1248	high	high
	PCB-1242	high	high
	PCB-1221	high	high/low
	PCB-1254	high	high
	PCB-1016	high	ok
	PCB-1260	high	low

Analytical Batch	Analyte	Column 1C %D	Column 2C %D
282696	PCB-1232	high	high
	PCB-1248	ok	ok
	PCB-1242	high	high
	PCB-1221	high	high/low
	PCB-1254	high	high
	PCB-1016	ok	ok
	PCB-1260	ok	ok
282709	PCB-1232	high	high
	PCB-1248	high	high
	PCB-1242	high	high
	PCB-1221	high/low	high
	PCB-1254	high	ok
	PCB-1016	high	high
	PCB-1260	high	ok

Notes:
ok = acceptable

The laboratory narrative only noted if the average %D for initial calibration check samples (ICVs) and CCVs did not meet the ±20% criteria. As part of this review, all CCV results were reviewed and the individual peaks were assessed using the ±20% criteria. As a result of that extended review, the following PCBs were qualified as estimated and flagged “J” or “UJ” based on the CCV % D. See table below for qualified PCBs qualified based on CCV recoveries:

Sample ID	Qualified PCBs
PDI-SC-S144-0to2	PCB-1260 (4.8 µg/Kg)
PDI-SC-S172-2to4	PCB-1254 (160 µg/Kg)
PDI-SC-S172-2to4D	PCB-1254 (140 µg/Kg)
PDI-SC-S172-4to6	PCB-1254 (29 µg/Kg)
PDI-SC-S178-0to2	PCB-1254 (320 µg/Kg)
PDI-SC-S178-2to3.7	PCB-1254 (110 µg/Kg)
PDI-SC-S178-3.7to4.7	PCB-1254 (35 µg/Kg)
PDI-SC-S178-8.7to10.7	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S178-10.7to12.7	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S178-12.7to14	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S083-0to1.6	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)

Sample ID	Qualified PCBs
PDI-SC-S083-1.6to3.5	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S083-3.5to5.0	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S083-5to6.6	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S032-0to2	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S032-2to4	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S032-4to6	PCB-1254 (1.3 µg/Kg) PCB-1260 (ND)
PDI-SC-S032-6to8	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S032-8to10	PCB-1221 (ND) PCB-1248 (ND) PCB-1260 (ND)
PDI-SC-S032-10to12	PCB-1260 (ND)
PDI-SC-S032-12to14	PCB-1260 (ND)
PDI-SC-S172-0to2	PCB-1254 (150 µg/Kg) PCB-1260 (ND)
PDI-SC-S218-6to8	PCB-1248 (0.77 µg/Kg) PCB-1260 (0.46 µg/Kg)
PDI-SC-S218-8to10	PCB-1260 (ND)
PDI-SC-S228-0to2.3	PCB-1260 (16 µg/Kg)
PDI-RB-SS-180801	PCB-1016 (ND)
PDI-RB-SS-180802-1645	PCB-1016 (ND)
PDI-RB-SS-180802	PCB-1016 (ND)

Note:
µg/Kg = micrograms per kilogram
ID = identification
ND = not detected
PCB = polychlorinated biphenyl

3. Blanks – Acceptable except as noted below:

   PAHs by Method 8270D-SIM – The following analytes were detected at concentrations between the method detection limits (MDLs) and the reporting limits:

Extraction Batch ID	Analyte	Result (µg/kg)
20938	2-Methylnaphthalene	0.152 J
	Benzo[a]anthracene	0.309 J
	Chrysene	0.385 J
	Fluoranthene	0.389 J
	Benzo[b]fluoranthene	0.375 J
	Benzo[k]fluoranthene	0.308 J
	Benzo[a]pyrene	0.314 J
	Naphthalene	0.299 J
	Indeno[1,2,3-cd]pyrene	0.308 J
	Phenanthrene	0.299 J
	Dibenz(a,h)anthracene	0.240 J
	Pyrene	0.445 J
	Benzo[g,h,i]perylene	0.309 J
281014	2-Methylnaphthalene	0.341 J
	Acenaphthylene	0.330 J
	Acenaphthene	0.218 J
	Anthracene	0.165 J
	Fluoranthene	0.394 J
	Fluorene	0.119 J
	Naphthalene	0.313 J
	Phenanthrene	0.672 J
	Pyrene	0.403 J
281134	2-Methylnaphthalene	0.161 J
	Anthracene	0.147 J
	Benzo[a]anthracene	0.325 J
	Benzo[b]fluoranthene	0.129 J
	Benzo[k]fluoranthene	0.195 J
	Phenanthrene	0.298 J
281359 (NOT USED)	2-Methylnaphthalene	0.723 J
	Naphthalene	0.297 J
281984 (RE)	2-Methylnaphthalene	0.174 J
	Naphthalene	0.358 J

Notes
µg/Kg = micrograms per kilogram
ID = identification
J = estimated concentration

The majority of the samples associated with method blank contamination were reported at concentrations greater than the reporting limits (RLs) and greater than two times the method blank detections; therefore, data were not qualified based on the method blank results. However, the following sample results were less than the RL and less than 2 times the concentration detected in the method blank and are qualified as estimated and flagged “J”.

Data Validation Report
Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
Subsurface Sediment – Deep Core Stations
TA Lab Group: 580-79329-1

Extraction Batch ID	Sample	Analyte	Result (µg/kg)	Flag
20938	PDI-SC-S218-4.5to6	Dibenz(a.h)anthracene	0.56 J B	J
	PDI-SC-S172-2to4D	Dibenz(a.h)anthracene	38 J B	J
	PDI-SC-S178-3.7to4.7	Dibenz(a.h)anthracene	11 J B	J
	PDI-SC-S178-4.7to6.7	2-Methylnaphthalene	3.0 J B	J
		Benzo[a]pyrene	5.0 J B	J
		Benzo[g,h,i]perylene	4.1 J B	J
		Benzo[k]fluoranthene	3.2 J B	J
		Dibenz(a,h)anthracene	1.4 J B	J
		Indeno[1,2,3-cd]pyrene	4.3 J B	J
		Naphthalene	5.7 J B	J
281014	PDI-SC-S178-6.7to8.7	Anthracene	0.35 J B	J
		Fluorene	0.71 J B	J
		Naphthalene	0.79 J B	J
	PDI-SC-S178-8.7to10.7	Acenaphthene	0.72 J B	J
		Anthracene	0.37 J B	J
		Fluoranthene	1.3 J B	J
		Fluorene	1.2 J B	J
		Naphthalene	1.0 J B	J
	PDI-SC-S178-10.7to12.7	Fluorene	0.72 J B	J
		Fluoranthene	1.0 J B	J
		Naphthalene	0.75 J B	J
	PDI-SC-S178-12.7TO14	Anthracene	0.34 J B	J
		Fluorene	0.70 J B	J
		Naphthalene	0.78 J B	J
281134	PDI-SC-S032-6to8	2-Methylnaphthalene	0.81 J B	J
	PDI-SC-S032-8to10	2-Methylnaphthalene	0.67 J B	J
	PDI-SC-S032-10to12	2-Methylnaphthalene	0.70 H J B	J
		Anthracene	0.61 J B	J
		Benzo[a]anthracene	1.2 J B	J
		Benzo[k]fluoranthene	0.85 J B	J
	PDI-SC-S032-12to14	2-Methylnaphthalene	0.86 J B	J
		Anthracene	0.67 J B	J
		Benzo[k]fluoranthene	0.67 J B	J
281984 (RE)	PDI-SC-S172-0to2(RE)	2-Methylnaphthalene	44 J B H	J
		Naphthalene	220 J H B	J
	PDI-SC-S218-6to8(RE)	2-Methylnaphthalene	0.93 J H B	J
	PDI-SC-S218-8to10(RE)	2-Methylnaphthalene	0.90 J H B	J

Note:
µg/Kg = micrograms per kilogram
B = analyte detected in the associated method blank
H = hold time exceedance
ID = identification
J = estimated concentration
U = not detected due to external contamination

The following sample results were detected at concentrations less than 2 times the concentration detected in the method blank and are qualified as not detected and flagged “U” at the reporting limit.

Extraction Batch ID	Sample	Analyte	Result (µg/kg)	Flag
281014	PDI-SC-S178-6.7to8.7	2-Methylnaphthalene	0.50 J B	U
		Acenaphthene	0.25 J B	U
	PDI-SC-S178-10.7to12.7	2-Methylnaphthalene	0.50 J B	U
		Acenaphthene	0.31 J B	U
		Anthracene	0.31 J B	U
		Phenanthrene	1.3 J B	U
	PDI-SC-S178-12.7TO14	2-Methylnaphthalene	0.57 J B	U
		Acenaphthene	0.34 J B	U
		Acenaphthylene	0.54 J B	U

Note:
µg/Kg = micrograms per kilogram
B = analyte detected in the associated method blank
ID = identification
J = estimated concentration
U = not detected due to external contamination

4. Surrogates – Acceptable except as noted below:

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-S144-0to2	Decachlorobiphenyl Tetrachloro-m-xylene	50 56
PDI-SC-S144-2to 4	Tetrachloro-m-xylene	51
PDI-SC-S144-4to6	Tetrachloro-m-xylene	39
PDI-SC-S144-6to8	Tetrachloro-m-xylene	57
PDI-SC-S144-8to10	Decachlorobiphenyl Tetrachloro-m-xylene	46 38
PDI-SC-S144-10to12.1	Tetrachloro-m-xylene	49
PDI-SC-S086-0to2	Tetrachloro-m-xylene	36
PDI-SC-S086-2to3.3	Tetrachloro-m-xylene	50
PDI-SC-S218-0to2	Tetrachloro-m-xylene	47
PDI-SC-S218-2to4.5	Tetrachloro-m-xylene	40
PDI-SC-S218-4.5to6	Tetrachloro-m-xylene	38
PDI-SC-S172-2to4	Tetrachloro-m-xylene	51
PDI-SC-S172-2to4D	Decachlorobiphenyl Tetrachloro-m-xylene	41 41
PDI-SC-S172-4to6	Tetrachloro-m-xylene	47
PDI-SC-S172-6to8.1	Tetrachloro-m-xylene	40
PDI-SC-S178-0to2	Tetrachloro-m-xylene	23
PDI-SC-S178-2to3.7	Tetrachloro-m-xylene	29
PDI-SC-S083-0to1.6	Tetrachloro-m-xylene	167
PDI-SC-S083-1.6to3.5	Tetrachloro-m-xylene	236
PDI-SC-S083-3.5to5.0	Tetrachloro-m-xylene	272
PDI-SC-S218-6to8	Tetrachloro-m-xylene	53
PDI-SC-S228-0to2.3	Tetrachloro-m-xylene	41
PDI-RB-SS-180801	Decachlorobiphenyl	35
PDI-RB-SS-180802-1645	Decachlorobiphenyl	31
PDI-RB-SS-180802	Decachlorobiphenyl	34

If one of the surrogate recoveries was acceptable, the data were not qualified. Also, data were not qualified if surrogate recoveries were high, sample dilution factors were ≥50, or if the sample analytes were not detected. Qualified results are listed below:

- For sample PDI-SC-S144-0to2, the result PCB-1260 was qualified as estimated and flagged (J) and all other results were flagged 'UJ' based on surrogate spike recoveries.

  For samples PDI-SC-S144-8to10 and PDI-SC-S172-2to4D, all PCB results were qualified as having estimated results and flagged 'J' or as having estimated reporting limits and flagged 'UJ' based on the surrogate spike recoveries.

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

PAHs by Method 8270D-SIM – For the LCS/LCSD in Batch 280882 (associated with the water samples only [rinsate blanks]), the percent recoveries and RPDs for the following analytes were outside of the control limits;

LCS/LCSD 580-80882/3-A				
Analyte	**LCS**	**LCSD**	**RPD**	**Control Limits (LCS / RPD)**
2-Methylnaphthalene	ok	ok	26%	53%–120%/23%
Acenaphthene	ok	ok	29%	64%–120%/20%
Anthracene	ok	ok	29%	46%–127%/19%
Benzo[a]anthracene	ok	ok	23%	70%–120%/17%
Chrysene	ok	139%	30%	65%–120%/19%
Fluoranthene	ok	ok	27%	72%–120%/21%
Benzo[b]fluoranthene	ok	136%	31%	57%–132%/25%
Fluorene	ok	ok	28%	67%–120%/20%
Benzo[k]fluoranthene	ok	145%	25%	61%–132%/22%
Naphthalene	ok	ok	26%	58%–120%/23%
Indeno[1,2,3-cd]pyrene	ok	151%	27%	53%–133%/25%
Phenanthrene	ok	ok	27%	69%–120%/21%
Dibenz(a.h)anthracene	ok	143%	ok	57%–132%/24%
Pyrene	ok	ok	26%	57%–133%/21%

Notes:
LCS = laboratory control sample
LCSD = laboratory control sample duplicate
ok = acceptable
RPD = relative percent difference

Because no MS/MSD was reported with this sample batch, only the detected result for chrysene in sample PDI-RB-SS-180802 (a rinsate blank) is qualified as estimated and flagged "J" due to high LCS/LCSD recoveries and RPDs. For the remaining compounds, as two of the three quality control parameters were acceptable, these data were not qualified.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable except as noted below:

PAHs by Method 8270D-SIM – MS/MSDs were performed using PDI-SC-S086-0to2, PDI-SC-S032-8to10, and PDI-SC-S218-6to8. The percent recoveries and RPDs for the following analytes were outside of the control limits;

PDI-SC-S086-0to2				
Analyte	**MS (%)**	**MSD (%)**	**RPD (%)**	**Control Limits (%) (MS-MSD/RPD)**
2-Methylnaphthalene	202	354	35	68–120/12
Acenaphthylene	494	201	28	68–120/12
Acenaphthene	6,518	2,707	48	68*120/12
Anthracene	5,204	1,496	50	73–125/12
Benzo[a]anthracene	4,409	1,133	44	66–120/14
Chrysene	3,563	632	40	69–120/10
Fluoranthene	15,251	4,902	41	74–125/13
Benzo[b]fluoranthene	4,432	1,282	41	63–121/10
Fluorene	3,856	1,704	46	73–120/13
Benzo[k]fluoranthene	1,110	379	37	63–123/15
Benzo[a]pyrene	4,386	1,283	40	72–124/12
Naphthalene	396	196	45	70–120/12
Indeno[1,2,3-cd]pyrene	3,233	1,176	35	65–121/15
Phenanthrene	20,912	10,866	33	73*120/11
Dibenz(a,h)anthracene	619	241	40	70–125/13
Pyrene	17,700	5,849	39	70–120/12
Benzo[g,h,i]perylene	3,852	1,175	39	63–120/14

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = relative percent difference

For all compounds except 2-methylnaphthalene and naphthalene, the spike concentrations were greater than 4 times the sample concentrations; therefore, the MS/MSD recoveries and RPD could not be assessed. For 2-methylnaphthalene and naphthalene, as two of the three quality control parameters (MS, MSD, and RPD) were not acceptable, the results are qualified as estimated and flagged “J” due to high MS/MSD recoveries and RPDs.

PDI-SC-S032-8to10				
Analyte	**MS (%)**	**MSD (%)**	**RPD (%)**	**Control Limits (%) (MS-MSD/RPD)**
Benzo[a]anthracene	ok	ok	19	66–120/14
Chrysene	ok	ok	18	74–125/13
Benzo[b]fluoranthene	ok	ok	12	63–121/10

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = relative percent difference

As two of the three quality control parameters (MS, MSD, and RPD) were acceptable for 2-methylnaphthalene, chrysene, and benzo[k]fluoranthene, these data were not qualified.

PDI-SC- S218-6to8				
Analyte	**MS (%)**	**MSD (%)**	**RPD (%)**	**Control Limits (%) (MS-MSD/RPD)**
Chrysene	ok	ok	14	69–120/10
Benzo[b]fluoranthene	ok	ok	14	63–121/10

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = relative percent difference

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

PCBs by EPA Method 8082A – MS/MSDs were performed using PDI-SC-S144-0to2, PDI-SC-S032-8to10, and PDI-SC-S218-6to8. The percent recoveries for the following analytes were outside of the control limits:

PDI-SC-S144-0to2				
Analyte	**MS**	**MSD**	**RPD**	**Control Limits (Matrix Spike / RPD)**
PCB-1016	53%	42%	23%	64–120% / 21%
PCB-1260	33%	26%	ok	63–130% / 25%

Notes
MS = Matrix Spike
MSD = Matrix Spike Duplicate
ok = acceptable
RPD = relative percent difference

The results for PCB-1016 and PCB-1260 in sample PDI-SC-S144-0to2 are qualified as estimated and flagged “J” due to low MS/MSD recoveries and/or high RPDs.

PDI-SC-S032-8to10				
Analyte	**MS**	**MSD**	**RPD**	**Control Limits (Matrix Spike / RPD)**
PCB-1016	59%	ok	ok	64–120% / 21%
PCB-1260	53%	58%	ok	63–130% / 25%

Notes
MS = Matrix Spike
MSD = Matrix Spike Duplicate
ok = acceptable
RPD = relative percent difference

The result for PCB-1260 in sample PDI-SC-S032-8to10 is qualified as estimated and flagged ‘UJ’ due to low MS/MSD recoveries.

PDI-SC-S218-6to8				
Analyte	**MS**	**MSD**	**RPD**	**Control Limits (Matrix Spike / RPD)**
PCB-1016	60%	ok	ok	64–120% / 21%

Notes
MS = Matrix Spike
MSD = Matrix Spike Duplicate
ok = acceptable
RPD = relative percent difference

As two of the three quality control parameters (MS, MSD, and RPD) were acceptable, this data was not qualified.

7. Field Duplicate – Acceptable except as noted below:

General – Field duplicates were submitted for PDI-SC-S086-0to2 and PDI-SC-S172-2to4 and identified as PDI-SC-S086-0to2D and PDI-SC-S172-2to4D, respectively. Results were comparable, except as noted below:

Sample PDI-SC-S086-0to2/PDI-SC-S086-0to2D				
Analyte	**Sample Result**	**Field Duplicate Result**	**RPD**	**Acceptable (<50%)**
2-Methylnaphthalene	280	1,700	143	no
Acenaphthene	8,800	12,000	31	yes
Acenaphthylene	1,800	9,300	135	no
Anthracene	10,000	14,000	33	yes
Benzo[a]anthracene	11,000	11,000	0	yes
Benzo[a]pyrene	12,000	13,000	8	yes
Benzo[b]fluoranthene	12,000	13,000	8	yes
Benzo[g,h,i]perilyene	11,000	12,000	9	yes
Benzo[k]fluoranthene	3,000	18,000	143	no
Chrysene	12,000	13,000	8	yes
Dibenz(a,h)anthracene	1,300	9,600	152	no
Fluoranthene	37,000	40,000	8	yes
Fluorene	5,000	39,000	154	no
Indeno[1,2,3-cd]pyrene	9,200	51,000	139	no
Naphthalene	420	3,500	157	no
Phenanthrene	39,000	52,000	29	yes
Pyrene	46,000	51,000	10	yes

Note:
RPD = relative percent difference

The results for 2-methylnaphthene, acenaphthylene, benzo[k] fluoranthene, dibenz(a,h)anthracene, fluorene, indeno[1,2,3-cd]pyrene, and naphthalene in samples PDI-SC-S086-0to2 and PDI-SC-S086-0to2D are qualified as estimated and flagged “J” due to poor field duplicate precision.

Sample PDI-SC-S172-2to4/PDI-SC-S172-2to4D				
Analyte	**Sample Result**	**Field Duplicate Result**	**RPD**	**Acceptable (<50%)**
2-Methylnaphthalene	110	130	17	yes
Acenaphthene	130	110	17	yes
Acenaphthylene	180	110	48	yes
Anthracene	290	200	37	yes
Benzo[a]anthracene	1,000	320	103	no
Benzo[a]pyrene	750	240	103	no
Benzo[b]fluoranthene	890	340	89	no
Benzo[g,h,i]perilyene	470	250	61	no
Benzo[k]fluoranthene	280	110	87	no
Chrysene	980	380	88	no
Dibenz(a,h)anthracene	110	38	97	no
Fluoranthene	16,000	830	63	no
Fluorene	120	110	9	yes
Indeno[1,2,3-cd]pyrene	450	220	69	no
Naphthalene	310	440	35	yes
Phenanthrene	900	710	24	yes
Pyrene	2,200	970	78	no

Note:
RPD = relative percent difference

The results for benzo[a] anthracene, benzo[a]pyrene, benzo[b] fluornnthene, benzo[g,h,i]perilyene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, and pyrene in samples PDI-SC-S172-2to4 and PDI-SC-S172-2to4D are qualified as estimated and flagged "J" due to poor field duplicate precision.

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 – The following samples were diluted due to the nature of the sample matrix: PDI-SC-S144-0to2 (580-79329-1), PDI-SC-S144-4to6 (580-79329-3), PDI-SC-S144-6to8 (580-79329-4), PDI-SC-S144-8to10 (580-79329-5), PDI-SC-S144-10to12.1 (580-79329-6), PDI-SC-S086-0to2D (580-79329-8), PDI-SC-S086-2to3.3 (580-79329-9), PDI-SC-S218-0to2 (580-79329-10), PDI-SC-S218-2to4.5 (580-79329-11), PDI-SC-S172-2to4 (580-79329-13), PDI-SC-S172-2to4D (580-79329-14), PDI-SC-S172-4to6 (580-79329-15), PDI-SC-S172-6to8.1 (580-79329-16), PDI-SC-S178-0to2 (580-79329-17), PDI-SC-S178-2to3.7 (580-79329-18), PDI-SC-S178-3.7to4.7 (580-79329-19), PDI-SC-S178-4.7to6.7 (580-79329-20), PDI-SC-S178-8.7to10.7 (580-79329-22), PDI-SC-S172-0to2 (580-79329-36), PDI-SC-S218-6to8 (580-79329-37), PDI-SC-S218-8to10 (580-79329-38) and PDI-SC-S228-0to2.3 (580-79329-39). Elevated RLs are provided. The following samples were diluted to

bring the concentration of target analytes within the calibration range: PDI-SC-S144-2to4 (580-79329-2), PDI-SC-S144-4to6 (580-79329-3), PDI-SC-S086-0to2 (580-79329-7), PDI-SC-S086-0to2 MS (580-79329-7 MS), PDI-SC-S086-0to2 MSD (580-79329-7 MSD), PDI-SC-S086-0to2D (580-79329-8), PDI-SC-S086-2to3.3 (580-79329-9), PDI-SC-S178-8.7to10.7 (580-79329-22), PDI-SC-S083-0to1.6 (580-79329-25), PDI-SC-S083-1.6to3.5 (580-79329-26), PDI-SC-S083-3.5to5.0 (580-79329-27) and PDI-SC-S083-5to6.6 (580-79329-28). Elevated RLs are provided.

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. Calculation Checks – Not Performed.

10. Other Items of Note:

PCBs by EPA Method 8082A – The following samples required a copper clean-up to reduce matrix interferences caused by sulfur: PDI-SC-S178-8.7to10.7(580-79329-22), PDI-SC-S178-10.7to12.7 (580-79329-23), PDI-SC-S178-12.7to14 (580-79329-24), PDI-SC-S083-0to1.6 (580-79329-25), PDI-SC-S083-1.6to3.5 (580-79329-26), PDI-SC-S083-3.5to5.0 (580-79329-27), PDI-SC-S083-5to6.6 (580-79329-28), PDI-SC-S032-0to2 (580-79329-29), PDI-SC-S032-2to4 (580-79329-30), PDI-SC-S032-6to8 (580-79329-32), PDI-SC-S032-8to10 (580-79329-33), PDI-SC-S032-8to10 (580-79329-33[MS]), PDI-SC-S032-8to10 (580-79329-33[MSD]), PDI-SC-S218-6to8 (580-79329-37), PDI-SC-S218-6to8 (580-79329-37[MS]) and PDI-SC-S218-6to8 (580-79329-37[MSD]).

The %RPD between the primary and confirmation column exceeded 40% for PCB-1016 in PDI-SC-S218-2to4.5 (580-79329-11), PCB-1248 in sample PDI-SC-S218-6to8 (580-79329-37), and PCB-1260 in PDI-SC-S086-0to2 (580-79329-7). The lower value(s) has been reported and qualified in accordance with the laboratory's Standard Operating Procedure (SOP). The associated results were qualified as estimated and flagged 'J' based on identification issues.

The laboratory narrative noted that samples PDI-SC-S032-2to4 and PDI-SC-S178-4.7to6.7 appeared to contain PCBs; however, due to weathering or other environmental processes, the PCBs in these samples do not closely match any of the laboratory's Aroclor standards used for instrument calibration. The samples have been quantified and reported with the predominant Aroclor. Due to the poor match with the Aroclor standards, there is increased qualitative and quantitative uncertainty associated with these results. The PCB-1254 result for sample PDI-SC-S032-2to4 and the PCB-1260 result sample PDI-SC-S178-4.7to6.7 were qualified as estimated and flagged 'J' base on identification issues.

The laboratory narrative noted that, for sample PDI-SC-S144-0to2, "…the sample contained more than one Aroclor with insufficient separation to quantify individually. The PCBs present are quantified as the predominant Aroclor." The PCB-1260 result for this sample was qualified as estimated and flagged 'J' base on identification issues.

A deviation from the SOP occurred. Details are as follows: Samples were to be vialed at a 2 milliliters (mL) final volume via client request for RL differentiation. The following samples

could not be brought down to a final volume of 2mL due to matrix interference: PDI-SC-S083-0to1.6 (580-79329-25), PDI-SC-S083-1.6to3.5 (580-79329-26), PDI-SC-S083-3.5to5.0 (580-79329-27), PDI-SC-S083-5to6.6 (580-79329-28), PDI-SC-S032-2to4 (580-79329-30), PDI-SC-S172-0to2 (580-79329-36) and PDI-SC-S228-0to2.3 (580-79329-39).The reporting limits were raised from a factor of two to ten times.

CONVENTIONAL ANALYSES

Samples were analyzed for TOC 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. No data qualifiers were assigned based on the holding time exceedance.

2. Blanks – Acceptable where applicable, except as noted below:

   TOC by Method SW9060 – Laboratory method blanks and continuing calibration blanks were analyzed with the samples, as appropriate.

Analysis Date	Analyte	Result
08/13/2018	TOC	100 mg/kg
8/15/2018	TOC	156 mg/kg

Note:
mg/kg = milligrams per kilogram
TOC = total organic carbon

With two exceptions, TOC was detected in the associated samples at concentrations greater than the RLs and greater than ten times the method blank detections; therefore, data were not qualified. The TOC results for PDI-SC-S218-4.5to6 and PDI-SC-S218-6to8 were qualified and flagged “J” due to method blank contamination.

Results of three field rinsate blanks were reported with the laboratory report. The following analytes were reported in the rinsate blanks. Data are not qualified based on rinsate blank contamination.

Rinsate Blank ID	Analyte	Result
PDI-RB-SS-180802-1645	TOC	0.25 mg/L
PDI-RB-SS-180802	TOC	0.24 mg/L

Note:
mg/L = micrograms per liter
TOC = total organic carbon

3. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable
4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable

   TOC by Method 9060 – MS/MSDs were performed using PDI-SC-S032-8to10 and PDI-SC-218-6to8. Results were acceptable.

5. Field Duplicate –Acceptable

   TOC by Method 9060 – field duplicates were submitted for PDI-SC-S086-0to2 and PDI-SC-S172-2to4 and identified as PDI-SC-S086-0to2D and PDI-SC-S172-2to4D, respectively. Results were comparable, with the exception of the TOC in samples PDI-SC-S086-0to2 and PDI-SC-S086-0to2D. These results are qualified as estimated and flagged "J" due to poor field duplicate precision.

   ASTM D-2216 – field duplicates were submitted for PDI-SC-S086-0to2 and PDI-SC-S172-2to4 and identified as PDI-SC-S086-0to2D and PDI-SC-S172-2to4D, respectively. Results were comparable.

   Total Solids at 70°C – field duplicates were submitted for PDI-SC-S086-0to2 and PDI-SC-S172-2to4 and identified as PDI-SC-S086-0to2D and PDI-SC-S172-2to4D, respectively. Results were comparable.

6. Laboratory Replicate – Acceptable

   TOC by Method 9060 – Laboratory duplicates and triplicates were performed using PDI-SC-S032-8to10 and PDI-SC-218-6to8. Results were acceptable.

   ASTM D-2216 – Laboratory duplicates were performed using PDI-SC-S144-6to8 and PDI-SC-S178-6.7to8.7. Results were comparable.

   Total Solids at 70°C – Laboratory duplicates were performed using PDI-SC-S144-0to2 and PDI-PDI-SC-S178-4.7to6.7. Results were comparable.

7. Reporting Limits – Acceptable
8. Calculation Checks – Not performed.

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

   The laboratory performed duplicate analysis at a rate of 1 per 20 samples per their internal requirements. Laboratory duplicates were performed on PDI-SC-S144-0to2 and PDI-SC-178-4.7-6.7. Results were acceptable with the following exceptions:

PDI-SC-S144-0to2				
Analyte	**Sample Result**	**Laboratory Duplicate Result**	**RPD**	**Acceptable (<20%)**
Fine sand	8.9	7.0	24	no
PDI-SC-S178-4.7-6.7				
Gravel	1.3	0.0	200	no
Coarse Sand	0.5	2.4	131	no
Medium Sand	0.1	0.2	67	no

Note:
RPD = relative percent difference

Although the results for gravel, coarse sand, and medium sand in sample PDI-SC-S178-4.7-6.7 exceed the acceptable RPD, the results are not qualified because the grain size fraction was less than 5% of the total combined fractions.

The result for fine sand in sample PDI-SC-S144-0to2 was assigned an “L” qualifier to indicate that the grain size fraction was greater than 5% of the total combined fractions and the RPD for the duplicate analysis on the sample was greater than 20%.

2. Calculation Checks – Not performed

OVERALL ASSESSMENT OF DATA

The data reported in this laboratory group is considered usable for meeting project objectives. The completeness for laboratory group 580-79329-1 is 100%.

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79329-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1016	4.2 U	µg/kg	4.2 UJ	s,m,md
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1221	4.2 U	µg/kg	4.2 UJ	s
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1232	4.2 U	µg/kg	4.2 UJ	s
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1242	4.2 U	µg/kg	4.2 UJ	s
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1248	4.2 U	µg/kg	4.2 UJ	s
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1254	4.2 U	µg/kg	4.2 UJ	s
PDI-SC-S144-0to2	580-79329-1	SW8082A	PCB-1260	4.8	µg/kg	4.8 J	s,c,q,m
PDI-SC-S144-0to2	580-79329-1	D7928/D6913	Fine Sand	8.9	%	8.9 L	ld
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1016	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1221	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1232	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1242	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1248	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1254	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S144-8to10	580-79329-5	SW8082A	PCB-1260	3.1 U	µg/kg	3.1 UJ	s
PDI-SC-S086-0to2	580-79329-7	SW8270D	2-Methylnaphthalene	280	µg/kg	280 J	fd,m,md
PDI-SC-S086-0to2	580-79329-7	SW8270D	Acenaphthylene	1,800	µg/kg	1,800 J	fd
PDI-SC-S086-0to2	580-79329-7	SW8270D	Benzo[k]fluoranthene	3,000	µg/kg	3,000 J	fd
PDI-SC-S086-0to2	580-79329-7	SW8270D	Dibenz(a,h)anthracene	1,300	µg/kg	1,300 J	fd
PDI-SC-S086-0to2	580-79329-7	SW8270D	Fluorene	5,000	µg/kg	5,000 J	fd
PDI-SC-S086-0to2	580-79329-7	SW8270D	Indeno[1,2,3-cd]pyrene	9,200	µg/kg	9,200 J	fd
PDI-SC-S086-0to2	580-79329-7	SW8270D	Naphthalene	420	µg/kg	420 J	fd,m,md
PDI-SC-S086-0to2	580-79329-7	SW8082A	PCB-1260	3.6	µg/kg	3.6 J	r
PDI-SC-S086-0to2	580-79329-7	SW9060	TOC	12,000	mg/Kg	12,000 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	2-Methylnaphthalene	1,700	µg/kg	1,700 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	Acenaphthylene	9,300	µg/kg	9,300 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	Benzo[k]fluoranthene	18,000	µg/kg	18,000 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	Dibenz(a,h)anthracene	9,600	µg/kg	9,600 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	Fluorene	39,000	µg/kg	39,000 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	Indeno[1,2,3-cd]pyrene	51,000	µg/kg	51,000 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW8270D	Naphthalene	3,500	µg/kg	3,500 J	fd
PDI-SC-S086-0to2D	580-79329-8	SW9060	TOC	6,700	mg/Kg	6,700 J	fd
PDI-SC-S218-2to4.5	580-79329-11	SW8082A	PCB-1016	45	µg/kg	45 J	r
PDI-SC-S218-4.5to6	580-79329-12	SW8270D	Dibenz(a,h)anthracene	0.56 J	µg/kg	0.56 J	bl
PDI-SC-S218-4.5to6	580-79329-12	SW9060	TOC	770 J	mg/Kg	770 J	bl
PDI-SC-S172-2to4	580-79329-13	SW8082A	PCB-1254	160	µg/kg	160 J	c
PDI-SC-S172-2to4	580-79329-13	SW8270D	Benzo[a]anthracene	1,000	µg/kg	1,000 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Benzo[a]pyrene	750	µg/kg	750 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Benzo[b]fluoranthene	890	µg/kg	890 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Benzo[g,h,i]perylene	470	µg/kg	470 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Benzo[k]fluoranthene	280	µg/kg	280 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Chrysene	980	µg/kg	980 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Dibenz(a,h)anthracene	110	µg/kg	110 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Fluoranthene	1,600	µg/kg	1,600 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Indeno[1,2,3-cd]pyrene	450	µg/kg	450 J	fd
PDI-SC-S172-2to4	580-79329-13	SW8270D	Pyrene	2,200	µg/kg	2,200 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Benzo[a]anthracene	320	µg/kg	320 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Benzo[a]pyrene	240	µg/kg	240 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Benzo[b]fluoranthene	340	µg/kg	340 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Benzo[g,h,i]perylene	250	µg/kg	250 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Benzo[k]fluoranthene	110	µg/kg	110 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Chrysene	380	µg/kg	380 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Dibenz(a,h)anthracene	38 J	µg/kg	38 J	fd,bl
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Fluoranthene	830	µg/kg	830 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Indeno[1,2,3-cd]pyrene	220	µg/kg	220 J	fd

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79329-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S172-2to4D	580-79329-14	SW8270D	Pyrene	970	µg/kg	970 J	fd
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1016	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1221	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1232	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1242	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1248	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1254	140	µg/kg	140 J	s,c
PDI-SC-S172-2to4D	580-79329-14	SW8082A	PCB-1260	3.8 U	µg/kg	3.8 UJ	s
PDI-SC-S172-4to6	580-79329-15	SW8082A	PCB-1254	29	µg/kg	29 J	c
PDI-SC-S178-0to2	580-79329-17	SW8082A	PCB-1254	320	µg/kg	320 J	c
PDI-SC-S178-2to3.7	580-79329-18	SW8082A	PCB-1254	110	µg/kg	110 J	c
PDI-SC-S178-3.7-4.7	580-79329-19	SW8270D	Dibenz(a,h)anthracene	11 J	µg/kg	11 J	bl
PDI-SC-S178-3.7-4.7	580-79329-19	SW8082A	PCB-1254	35	µg/kg	35 J	c
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	2-Methylnaphthalene	3.0 J	µg/kg	3.0 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	Benzo[a]pyrene	5.0 J	µg/kg	5.0 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	Benzo[g,h,i]perylene	4.1 J	µg/kg	4.1 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	Benzo[k]fluoranthene	3.2 J	µg/kg	3.2 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	Dibenz(a,h)anthracene	1.4 J	µg/kg	1.4 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	Indeno[1,2,3-cd]pyrene	4.3 J	µg/kg	4.3 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8270D	Naphthalene	5.7 J	µg/kg	5.7 J	bl
PDI-SC-S178-4.7to6.7	580-79329-20	SW8082A	PCB-1260	0.92 J	µg/kg	0.92 J	q,c
PDI-SC-S178-6.7-8.7	580-79329-21	SW8270D	2-Methylnaphthalene	0.50 J	µg/kg	1.4 U	bl
PDI-SC-S178-6.7-8.7	580-79329-21	SW8270D	Acenaphthene	0.25 J	µg/kg	1.4 U	bl
PDI-SC-S178-6.7-8.7	580-79329-21	SW8270D	Anthracene	0.35 J	µg/kg	0.35 J	bl
PDI-SC-S178-6.7-8.7	580-79329-21	SW8270D	Fluorene	0.71 J	µg/kg	0.71 J	bl
PDI-SC-S178-6.7-8.7	580-79329-21	SW8270D	Naphthalene	0.79 J	µg/kg	0.79 J	bl
PDI-SC-S178-8.7to10.7	580-79329-22	SW8270D	Acenaphthene	0.72 J	µg/kg	0.72 J	bl
PDI-SC-S178-8.7to10.7	580-79329-22	SW8270D	Anthracene	0.37 J	µg/kg	0.37 J	bl
PDI-SC-S178-8.7to10.7	580-79329-22	SW8270D	Fluoranthene	1.3 J	µg/kg	1.3 J	bl
PDI-SC-S178-8.7to10.7	580-79329-22	SW8270D	Fluorene	1.2 J	µg/kg	1.2 J	bl
PDI-SC-S178-8.7to10.7	580-79329-22	SW8270D	Naphthalene	1.0 J	µg/kg	1.0 J	bl
PDI-SC-S178-8.7to10.7	580-79329-22	SW8082A	PCB-1221	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-8.7to10.7	580-79329-22	SW8082A	PCB-1248	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-8.7to10.7	580-79329-22	SW8082A	PCB-1260	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	2-Methylnaphthalene	0.50 J	µg/kg	1.4 U	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	Acenaphthene	0.31 J	µg/kg	1.4 U	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	Anthracene	0.31 J	µg/kg	1.4 U	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	Fluoranthene	1.0 J	µg/kg	1.0 J	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	Fluorene	0.72 J	µg/kg	0.72 J	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	Naphthalene	0.75 J	µg/kg	0.75 J	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8270D	Phenanthrene	1.3 J	µg/kg	1.4 U	bl
PDI-SC-S178-10.7to12.7	580-79329-23	SW8082A	PCB-1221	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-10.7to12.7	580-79329-23	SW8082A	PCB-1248	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-10.7to12.7	580-79329-23	SW8082A	PCB-1260	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-12.7to14	580-79329-24	SW8270D	2-Methylnaphthalene	0.57 J	µg/kg	1.5 U	bl
PDI-SC-S178-12.7to14	580-79329-24	SW8270D	Acenaphthene	0.34 J	µg/kg	1.5 U	bl
PDI-SC-S178-12.7to14	580-79329-24	SW8270D	Acenaphthylene	0.54 J	µg/kg	1.5 U	bl
PDI-SC-S178-12.7to14	580-79329-24	SW8270D	Anthracene	0.34 J	µg/kg	0.34 J	bl
PDI-SC-S178-12.7to14	580-79329-24	SW8270D	Fluorene	0.70 J	µg/kg	0.70 J	bl
PDI-SC-S178-12.7to14	580-79329-24	SW8270D	Naphthalene	0.78 J	µg/kg	0.78 J	bl
PDI-SC-S178-12.7to14	580-79329-24	SW8082A	PCB-1221	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-12.7to14	580-79329-24	SW8082A	PCB-1248	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S178-12.7to14	580-79329-24	SW8082A	PCB-1260	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S083-0to1.6	580-79329-25	SW8082A	PCB-1221	28 U	µg/kg	28 UJ	c
PDI-SC-S083-0to1.6	580-79329-25	SW8082A	PCB-1248	28 U	µg/kg	28 UJ	c

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79329-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S083-0to1.6	580-79329-25	SW8082A	PCB-1260	28 U	µg/kg	28 UJ	c
PDI-SC-S083-1.6to3.5	580-79329-26	SW8082A	PCB-1221	12 U	µg/kg	12 UJ	c
PDI-SC-S083-1.6to3.5	580-79329-26	SW8082A	PCB-1248	12 U	µg/kg	12 UJ	c
PDI-SC-S083-1.6to3.5	580-79329-26	SW8082A	PCB-1260	12 U	µg/kg	12 UJ	c
PDI-SC-S083-3.5to5.0	580-79329-27	SW8082A	PCB-1221	12 U	µg/kg	12 UJ	c
PDI-SC-S083-3.5to5.0	580-79329-27	SW8082A	PCB-1248	12 U	µg/kg	12 UJ	c
PDI-SC-S083-3.5to5.0	580-79329-27	SW8082A	PCB-1260	12 U	µg/kg	12 UJ	c
PDI-SC-S083-5to6.6	580-79329-28	SW8082A	PCB-1221	13 U	µg/kg	13 UJ	c
PDI-SC-S083-5to6.6	580-79329-28	SW8082A	PCB-1248	13 U	µg/kg	13 UJ	c
PDI-SC-S083-5to6.6	580-79329-28	SW8082A	PCB-1260	13 U	µg/kg	13 UJ	c
PDI-SC-S032-0to2	580-79329-29	SW8082A	PCB-1221	2.5 U	µg/kg	2.5 UJ	c
PDI-SC-S032-0to2	580-79329-29	SW8082A	PCB-1248	2.5 U	µg/kg	2.5 UJ	c
PDI-SC-S032-0to2	580-79329-29	SW8082A	PCB-1260	2.5 U	µg/kg	2.5 UJ	c
PDI-SC-S032-2to4	580-79329-30	SW8082A	PCB-1254	62	µg/kg	62 J	q
PDI-SC-S032-2to4	580-79329-30	SW8082A	PCB-1221	5.0 U	µg/kg	5.0 UJ	c
PDI-SC-S032-2to4	580-79329-30	SW8082A	PCB-1248	5.0 U	µg/kg	5.0 UJ	c
PDI-SC-S032-2to4	580-79329-30	SW8082A	PCB-1260	5.0 U	µg/kg	5.0 UJ	c
PDI-SC-S032-4to6	580-79329-31	SW8082A	PCB-1254	1.3 J	µg/kg	1.3 J	c
PDI-SC-S032-4to6	580-79329-31	SW8082A	PCB-1260	2.9 U	µg/kg	2.9 UJ	c
PDI-SC-S032-6to8	580-79329-32	SW8082A	PCB-1221	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-6to8	580-79329-32	SW8082A	PCB-1248	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-6to8	580-79329-32	SW8082A	PCB-1260	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-6to8	580-79329-32	SW8270D	2-Methylnaphthalene	0.81 J	µg/kg	0.81 J	bl
PDI-SC-S032-8to10	580-79329-33	SW8270D	2-Methylnaphthalene	0.67 J	µg/kg	0.67 J	bl
PDI-SC-S032-8to10	580-79329-33	SW8082A	PCB-1260	2.8 U	µg/kg	2.8 UJ	m,c
PDI-SC-S032-8to10	580-79329-33	SW8082A	PCB-1221	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-8to10	580-79329-33	SW8082A	PCB-1248	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-10to12	580-79329-34	SW8082A	PCB-1260	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-10to12	580-79329-34	SW8270D	2-Methylnaphthalene	0.70 J	µg/kg	0.70 J	bl
PDI-SC-S032-10to12	580-79329-34	SW8270D	Anthracene	0.61 J	µg/kg	0.61 J	bl
PDI-SC-S032-10to12	580-79329-34	SW8270D	Benzo[a]anthracene	1.2 J	µg/kg	1.2 J	bl
PDI-SC-S032-10to12	580-79329-34	SW8270D	Benzo[k]fluoranthene	0.85 J	µg/kg	0.85 J	bl
PDI-SC-S032-12to14	580-79329-35	SW8082A	PCB-1260	2.8 U	µg/kg	2.8 UJ	c
PDI-SC-S032-12to14	580-79329-35	SW8270D	2-Methylnaphthalene	0.86 J	µg/kg	0.86 J	bl
PDI-SC-S032-12to14	580-79329-35	SW8270D	Anthracene	0.67 J	µg/kg	0.67 J	bl
PDI-SC-S032-12to14	580-79329-35	SW8270D	Benzo[k]fluoranthene	0.67 J	µg/kg	0.67 J	bl
PDI-SC-S172-0to2	580-79329-36	SW8082A	PCB-1254	150	µg/kg	150 J	c
PDI-SC-S172-0to2	580-79329-36	SW8082A	PCB-1260	9.6 U	µg/kg	9.6 UJ	c
PDI-SC-S172-0TO2	580-79329-36	SW8270D	2-Methylnaphthalene	45 J	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Acenaphthene	60 J	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Acenaphthylene	70 J	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Anthracene	69 J	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Benz(a)anthracene	180	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Benzo(a)pyrene	180	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Benzo(b)fluoranthene	300	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Benzo(g,h,i)perylene	160	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Benzo(k)fluoranthene	110 J	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Chrysene	290	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Dibenz(a,h)anthracene	120 U	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Fluoranthene	490	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Fluorene	46 J	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Indeno(1,2,3-cd)pyrene	170	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Naphthalene	160	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Phenanthrene	340	µg/kg	DNR	ma
PDI-SC-S172-0TO2	580-79329-36	SW8270D	Pyrene	600	µg/kg	DNR	ma

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79329-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	2-Methylnaphthalene	44 J	µg/kg	44 J	h,bl
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Acenaphthene	120 J	µg/kg	120 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Acenaphthylene	110 J	µg/kg	110 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Anthracene	130 J	µg/kg	130 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Benzo[a]anthracene	200 J	µg/kg	200 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Benzo[a]pyrene	210 J	µg/kg	210 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Benzo[b]fluoranthene	290	µg/kg	290 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Benzo[g,h,i]perylene	170 J	µg/kg	170 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Benzo[k]fluoranthene	150 J	µg/kg	150 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Chrysene	320	µg/kg	320 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Dibenz(a,h)anthracene	45 J	µg/kg	45 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Fluoranthene	590	µg/kg	590 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Fluorene	56 J	µg/kg	56 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Indeno[1,2,3-cd]pyrene	160 J	µg/kg	160 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Naphthalene	220 J	µg/kg	220 J	h,bl
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Phenanthrene	440	µg/kg	440 J	h
PDI-SC-S172-0to2	580-79329-36 (RE)	SW8270D	Pyrene	730	µg/kg	730 J	h
PDI-SC-S218-6TO8	580-79329-37	SW8270D	2-Methylnaphthalene	1.6	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Acenaphthene	0.58 J	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Acenaphthylene	0.76 J	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Anthracene	0.72 J	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Benz(a)anthracene	2.4	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Benzo(a)pyrene	2.2	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Benzo(b)fluoranthene	2.4	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Benzo(g,h,i)perylene	2.2	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Benzo(k)fluoranthene	1.4	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Chrysene	2.7	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Dibenz(a,h)anthracene	0.44 J	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Fluoranthene	3.2	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Fluorene	1.1	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Indeno(1,2,3-cd)pyrene	2.4	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Naphthalene	1.3	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Phenanthrene	3.9	µg/kg	DNR	ma
PDI-SC-S218-6TO8	580-79329-37	SW8270D	Pyrene	5.5	µg/kg	DNR	ma
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	2-Methylnaphthalene	0.93 J	µg/kg	0.93 J	h,bl
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Acenaphthene	1.2	µg/kg	1.2 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Acenaphthylene	0.89 J	µg/kg	0.89 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Anthracene	1.3	µg/kg	1.3 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Benzo[a]anthracene	1.7	µg/kg	1.7 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Benzo[a]pyrene	1.5	µg/kg	1.5 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Benzo[b]fluoranthene	2.0	µg/kg	2.0 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Benzo[g,h,i]perylene	2.4	µg/kg	2.4 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Benzo[k]fluoranthene	0.60 J	µg/kg	0.60 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Chrysene	2.2	µg/kg	2.2 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Dibenz(a,h)anthracene	0.33 J	µg/kg	0.33 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Fluoranthene	3.1	µg/kg	3.1 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Fluorene	0.49 J	µg/kg	0.49 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Indeno[1,2,3-cd]pyrene	1.5	µg/kg	1.5 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Naphthalene	1.8	µg/kg	1.8 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Phenanthrene	4.1	µg/kg	4.1 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8270D	Pyrene	5.5	µg/kg	5.5 J	h
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8082A	PCB-1248	0.77 J	µg/kg	0.77 J	r,c
PDI-SC-S218-6to8	580-79329-37 (RE)	SW8082A	PCB-1260	0.46 J	µg/kg	0.46 J	c
PDI-SC-S218-6to8	580-79329-37 (RE)	SW9060	TOC	410 J	mg/Kg	410 J	bl
PDI-SC-S218-8to10	580-79329-38	SW8082A	PCB-1260	2.3 U	µg/kg	2.3 UJ	c

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79329-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S218-8TO10	580-79329-38	SW8270D	2-Methylnaphthalene	1.1 J	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Acenaphthene	1.8	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Acenaphthylene	3.4	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Anthracene	1.4	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Benz(a)anthracene	2.2	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Benzo(a)pyrene	1.9	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Benzo(b)fluoranthene	2.3	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Benzo(g,h,i)perylene	1.9	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Benzo(k)fluoranthene	0.90 J	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Chrysene	2.5	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Dibenz(a,h)anthracene	0.33 J	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Fluoranthene	4.4	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Fluorene	0.76 J	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Indeno(1,2,3-cd)pyrene	1.7	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Naphthalene	12	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Phenanthrene	6.5	µg/kg	DNR	ma
PDI-SC-S218-8TO10	580-79329-38	SW8270D	Pyrene	8	µg/kg	DNR	ma
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	2-Methylnaphthalene	0.90 J	µg/kg	0.90 J	h,bl
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Acenaphthene	0.90 J	µg/kg	0.90 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Acenaphthylene	0.94 J	µg/kg	0.94 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Anthracene	0.77 J	µg/kg	0.77 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Benzo[a]anthracene	1.8	µg/kg	1.8 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Benzo[a]pyrene	1.6	µg/kg	1.6 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Benzo[b]fluoranthene	2.0	µg/kg	2.0 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Benzo[g,h,i]perylene	2.3	µg/kg	2.3 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Benzo[k]fluoranthene	0.62 J	µg/kg	0.62 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Chrysene	2.5	µg/kg	2.5 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Dibenz(a,h)anthracene	0.42 J	µg/kg	0.42 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Fluoranthene	3.0	µg/kg	3.0 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Fluorene	0.32 J	µg/kg	0.32 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Indeno[1,2,3-cd]pyrene	1.4	µg/kg	1.4 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Naphthalene	1.8	µg/kg	1.8 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Phenanthrene	2.7	µg/kg	2.7 J	h
PDI-SC-S218-8to10	580-79329-38 (RE)	SW8270D	Pyrene	5.3	µg/kg	5.3 J	h
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	2-Methylnaphthalene	10 J	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Acenaphthene	3.7 J	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Acenaphthylene	5.6 J	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Anthracene	17	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Benz(a)anthracene	25	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Benzo(a)pyrene	33	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Benzo(b)fluoranthene	48	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Benzo(g,h,i)perylene	31	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Benzo(k)fluoranthene	16	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Chrysene	30	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Dibenz(a,h)anthracene	6.8 J	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Fluoranthene	24	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Fluorene	2.6 J	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Indeno(1,2,3-cd)pyrene	34	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Naphthalene	8.9 J	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Phenanthrene	29	µg/kg	DNR	ma
PDI-SC-S228-0TO2.3	580-79329-39	SW8270D	Pyrene	50	µg/kg	DNR	ma
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	2-Methylnaphthalene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Anthracene	16 J	µg/kg	16 J	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Acenaphthylene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Acenaphthene	120 U	µg/kg	120 UJ	h

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep Core Stations
TestAmerica Laboratory Group: 580-79329-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Chrysene	56 J	µg/kg	56 J	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Benzo[b]fluoranthene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Benzo[a]anthracene	19 J	µg/kg	19 J	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Benzo[a]pyrene	38 J	µg/kg	38 J	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Benzo[g,h,i]perylene	20 J	µg/kg	20 J	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Benzo[k]fluoranthene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Dibenz(a,h)anthracene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Fluoranthene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Fluorene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Indeno[1,2,3-cd]pyrene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Naphthalene	120 U	µg/kg	120 UJ	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Phenanthrene	46 J	µg/kg	46 J	h
PDI-SC-S228-0to2.3	580-79329-39 (RE)	SW8270D	Pyrene	67 J	µg/kg	67 J	h
PDI-SC-S228-0to2.3	580-79329-39	SW8082A	PCB-1260	16	µg/kg	16 J	c
PDI-RB-SS-180801	580-79329-44	SW8082A	PCB-1016	0.47 U	µg/L	0.47 UJ	c
PDI-RB-SS-180802-1645	580-79329-45	SW8082A	PCB-1016	0.44 U	µg/L	0.44 UJ	c
PDI-RB-SS-180802	580-79329-46	SW8270D	Chrysene	0.0079 J	µg/L	0.0079 J	l,ld
PDI-RB-SS-180802	580-79329-46	SW8082A	PCB-1016	0.44 U	µg/L	0.44 UJ	c

% = percent
µg/L = micrograms per liter
µg/kg = micrograms per kilogram
bl = laboratory blank contamination
c = calibration issue
fd = field duplicate RPDs
H = holding time issue
ID = identification
J= estimated concentration
l = LCS recoveries
L = the grain size fraction greater than 5 percent of toal combined fractions and the RPD for the duplicate analysis on the sample fraction was greater than 20%
ld = laboratroy duplicate RPDs
m = matrix spike recovery
ma = multiple analyses. Sample analyzed more than once, a value from another analysis should be used.
md = matrix spike/matrix spike duplicated RPD
q = quantitation issue
r = dual column RPD
s = surrogate recovery
U = not detected
UJ = estimated reporting limit