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Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland Harbor Superfund Site Subsurface Sediment – Deep/Nearshore Core Stations	
Laboratory:	TestAmerica Laboratories, Incorporated, Seattle, WA	
Laboratory Group:	580-79672-1	
Analyses/Method:	Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), Total Organic Carbon (TOC), Total Solids, and Grain Size	
Validation Level:	Stage 2A/Stage 4 on EPA split sample (PDI-SC-S113(A)-2.2TO4.6)	
AECOM Project Number:	60566335, Task #2.12	
Prepared by:	Debbie Casagrande/AECOM	Completed on: December 27, 2018
Reviewed by:	Stacy Louie/AECOM	File Name: 580-79672-1 DVR

SUMMARY

The data quality review of 52 subsurface sediment samples (includes 3 field duplicates [FDs]) and 2 Equipment Blanks (rinsate blanks) collected on August 15 through17, 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 580-79672-1:

Sample ID	Laboratory ID
PDI-SC-S113(A)-0TO2.2	580-79672-1
PDI-SC-S113(A)-2.2TO4.6	580-79672-2
PDI-SC-S113(B)-3.6TO5.6	580-79672-3
PDI-SC-S113(B)-5.6TO7.4	580-79672-4
PDI-SC-S113(B)-7.4TO10	580-79672-5
PDI-SC-S113(B)-10TO12	580-79672-6
PDI-SC-S113(B)-12TO13.8	580-79672-7
PDI-SC-S109-0TO2	580-79672-8
PDI-SC-S109-2TO4	580-79672-9
PDI-SC-S109-4TO6	580-79672-10
PDI-SC-S109-6TO8	580-79672-11
PDI-SC-S109-8TO10	580-79672-12
PDI-SC-S109-10TO11.3	580-79672-13
PDI-SC-S131-0TO2	580-79672-14
PDI-SC-S131-2TO4	580-79672-15

Sample ID	Laboratory ID
PDI-SC-S263-3.8TO5.9	580-79672-30
PDI-SC-S108-0TO1.9	580-79672-31
PDI-SC-S108-1.9TO3	580-79672-32
PDI-SC-S108-3TO4.7	580-79672-33
PDI-SC-S108-4.7TO6.7	580-79672-34
PDI-SC-S108-6.7TO8.8	580-79672-35
PDI-SC-S108-6.7TO8.8D (FD of PDI-SC-S108-6.7TO8.8)	580-79672-36
PDI-SC-S108-8.8TO9.8	580-79672-37
PDI-SC-S157-0TO2	580-79672-38
PDI-SC-S157-2TO3.7	580-79672-39
PDI-SC-S157-3.7TO6	580-79672-40
PDI-SC-S157-6TO8	580-79672-41
PDI-SC-S157-8TO10	580-79672-42
PDI-SC-S157-10TO12.4	580-79672-43

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Sample ID	Laboratory ID
PDI-SC-S131-4TO6	580-79672-16
PDI-SC-S131-6TO8	580-79672-17
PDI-SC-S256-0TO2	580-79672-18
PDI-SC-S256-2TO4	580-79672-19
PDI-SC-S256-2TO4D (FD of PDI-SC-S256-2TO4)	580-79672-20
PDI-SC-S256-4TO6	580-79672-21
PDI-SC-S256-6TO8.7	580-79672-22
PDI-SC-S256-8.7TO9.7	580-79672-23
PDI-SC-S256-9.7TO10.7	580-79672-24
PDI-SC-S232-0TO2	580-79672-25
PDI-SC-S232-2TO4	580-79672-26
PDI-SC-S232-4TO6.2	580-79672-27
PDI-SC-S263-0TO2	580-79672-28
PDI-SC-S263-2TO3.8	580-79672-29

Sample ID	Laboratory ID
PDI-SC-S157-12.4TO14	580-79672-44
PDI-SC-S157-14TO15.9	580-79672-45
PDI-RB-SS-180816-1110 (Rinsate Blank)	580-79672-46
PDI-RB-SS-180817 (Rinsate Blank)	580-79672-47
PDI-SC-S053-0TO2	580-79672-48
PDI-SC-S053-2TO4	580-79672-49
PDI-SC-S053-4TO6	580-79672-50
PDI-SC-S053-6TO8	580-79672-51
PDI-SC-S053-8TO10	580-79672-52
PDI-SC-S053-10TO12.4	580-79672-53
PDI-SC-S113(A)-2.2TO4.6D (FD of PDI-SC-S113(A)-2.2TO4.6)	580-79672-54

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.

As noted in the laboratory narrative, samples were placed in freezers at -10 degrees Celsius to extend holding time on August 28, 2018.

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 – 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:

Analytical Batch	Analyte	Column 1C %D	Column 2C %D
283038	PCB-1221	low/high	ok
	PCB-1232	high	high
	PCB-1242	high	high
	PCB-1248	high	high
285345	PCB-1016	ok	high
	PCB-1232	ok	high
	PCB-1242	low	high
	PCB-1248	low	high
	PCB-1254	low	high
	PCB-1260	low	high
285370	PCB-1016	high	ok
	PCB-1232	low	ok
	PCB-1242	low	ok
	PCB-1248	low	high
	PCB-1254	high	ok
	PCB-1260	high	ok
285642	PCB-1016	ok	high
	PCB-1232	high	ok
	PCB-1242	low	ok
	PCB-1248	high	ok
	PCB-1254	low	high
	PCB-1260	ok	high
285677	PCB-1016	ok	high
	PCB-1232	ok	high
	PCB-1242	high	ok
	PCB-1248	ok	high
	PCB-1254	ok	high
	PCB-1260	ok	high
285683	PCB-1016	ok	low
	PCB-1232	low	low
	PCB-1242	ok	low
	PCB-1260	ok	low
285909	PCB-1016	ok	high
	PCB-1221	ok	high
	PCB-1232	ok	high
	PCB-1242	ok	high
	PCB-1248	ok	high
	PCB-1254	ok	high
	PCB-1260	high	high

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 ‘J’ or flagged ‘UJ’ based on the CCV % D. See table below for qualified PCBs and Table 1 for qualified results.

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Sample ID	Qualified PCBs
PDI-SC-S263-3.8TO5.9 PDI-SC-S108-0TO1.9 PDI-SC-S108-1.9TO3 PDI-SC-S108-3TO4.7 PDI-SC-S108-4.7TO6.7 PDI-SC-S108-6.7TO8.8 PDI-SC-S108-8.8TO9.8 PDI-SC-S157-0TO2 PDI-SC-S157-2TO3.7 PDI-SC-S157-3.7TO6 PDI-SC-S157-8TO10 PDI-SC-S157-10TO12.4 PDI-SC-S157-12.4TO14 PDI-SC-S157-14TO15.9 PDI-SC-S053-0TO2 PDI-SC-S053-2TO4	PCB-1242, PCB-1248, PCB-1254, and PCB-1260 qualified in all samples.
PDI-SC-S053-4TO6 PDI-SC-S053-6TO8 PDI-SC-S053-8TO10 PDI-SC-S053-10TO12.4	PCB-1232, PCB-1242, and PCB-1248 qualified in all samples, PCB-1260 qualified in sample PDI-SC-S053-4TO6 only.
PDI-RB-SS-180816-1110 PDI-RB-SS-180817	PCB-1221 qualified for all samples
PDI-SC-S113(A)-0TO2.2 PDI-SC-S113(A)-2.2TO4.6 PDI-SC-S113(B)-3.6TO5.6 PDI-SC-S113(B)-5.6TO7.4 PDI-SC-S113(B)-7.4TO10 PDI-SC-S113(B)-10TO12 PDI-SC-S113(B)-12TO13.8 PDI-SC-S109-0TO2 PDI-SC-S109-2TO4 PDI-SC-S109-4TO6 PDI-SC-S131-4TO6 PDI-SC-S131-6TO8	PCB-1254 qualified for all samples
PDI-SC-S256-4TO6 PDI-SC-S256-6TO8.7 PDI-SC-S256-8.7TO9.7 PDI-SC-S256-9.7TO10.7 PDI-SC-S232-0TO2 PDI-SC-S232-2TO4 PDI-SC-S232-4TO6.2 PDI-SC-S263-0TO2 PDI-SC-S263-2TO3.8 PDI-SC-S108-6.7TO8.8D PDI-SC-S113(A)-2.2TO4.6D	PCB-1232 qualified for all samples

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 Date	Analyte	Result (µg/kg)
10/3/2018 (MB 580-285540/1-A)	Fluoranthene	0.366 J
10/3/2018 (MB 580-285541/1-A)	Anthracene	0.172 J
	Benzo[a]anthracene	0.280 J
	Fluoranthene	0.341 J
	Benzo[b]fluoranthene	0.411 J
	Benzo[k]fluoranthene	0.462 J
	Napthalene	0.249 J
	Phenathrene	0.577 J
	Pyrene	0.331 J

Notes:
µg/kg = micrograms per kilogram

Anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene naphthalene, phenanthrene, and pyrene were detected in the associated samples at concentrations greater than the reporting limits and greater than two times the method blank detections; therefore, data were not qualified based on these method blank results, except for benzo[k]fluoranthene in sample PDI-SC-S157-6to8 and fluoranthene in sample PDI-SC-S157-14to15.9. These two results were qualified as not detected and 'U' flagged at the reporting limit.

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:

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Sample	Surrogate	% Recovery
PDI-SC-S131-6TO8	Decachlorobiphenyl	38
	Tetrachloro-m-xylene	36
PDI-SC-S256-0TO2	Decachlorobiphenyl	50
PDI-SC-S256-2TO4	Decachlorobiphenyl	53
	Tetrachloro-m-xylene	57
PDI-SC-S256-2TO4D	Decachlorobiphenyl	52
	Tetrachloro-m-xylene	55
PDI-SC-S256-4TO6	Decachlorobiphenyl	47
	Tetrachloro-m-xylene	51
PDI-SC-S256-6TO8.7	Decachlorobiphenyl	53
	Tetrachloro-m-xylene	52
PDI-SC-S256-8.7TO9.7	Tetrachloro-m-xylene	55
PDI-SC-S256-9.7TO10.7	Decachlorobiphenyl	51
	Tetrachloro-m-xylene	56
PDI-SC-S232-4TO6.2	Tetrachloro-m-xylene	56
PDI-SC-S263-0TO2	Decachlorobiphenyl	51
PDI-SC-S263-3.8TO5.9	Decachlorobiphenyl	51
	Tetrachloro-m-xylene	46
PDI-SC-S263-3.8TO5.9MS	Decachlorobiphenyl	45
	Tetrachloro-m-xylene	49
PDI-SC-S263-3.8TO5.9MSD	Decachlorobiphenyl	51
	Tetrachloro-m-xylene	51
PDI-SC-S108-1.9TO3	Decachlorobiphenyl	49
	Tetrachloro-m-xylene	50
PDI-SC-S108-3TO4.7	Decachlorobiphenyl	49
	Tetrachloro-m-xylene	51
PDI-SC-S108-4.7TO6.7	Decachlorobiphenyl	47
	Tetrachloro-m-xylene	47
PDI-SC-S108-6.7TO8.8	Decachlorobiphenyl	50
	Tetrachloro-m-xylene	50
PDI-SC-S108-8.8TO9.8	Tetrachloro-m-xylene	52
PDI-SC-S157-0TO2	Decachlorobiphenyl	49
	Tetrachloro-m-xylene	45
PDI-SC-S157-2TO3.7	Tetrachloro-m-xylene	54
PDI-SC-S157-3.7TO6	Tetrachloro-m-xylene	49
PDI-SC-S157-8TO10	Tetrachloro-m-xylene	52
PDI-SC-S157-12.4TO14	Tetrachloro-m-xylene	24
PDI-SC-S157-14TO15.9	Tetrachloro-m-xylene	53
PDI-SC-S053-0TO2	Decachlorobiphenyl	53
	Tetrachloro-m-xylene	46
PDI-SC-S053-2TO4	Tetrachloro-m-xylene	50
PDI-SC-S053-4TO6	Tetrachloro-m-xylene	52
PDI-SC-S053-6TO8	Tetrachloro-m-xylene	48
PDI-SC-S053-8TO10	Tetrachloro-m-xylene	50
PDI-SC-S053-10TO12.4	Tetrachloro-m-xylene	50

Data were not qualified based on surrogate recoveries in QC samples. If one of the surrogate recoveries was acceptable the data were not qualified. Also, data were not qualified if sample dilution factors were ≥50. Qualified samples are listed below: PDI-SC-S131-6TO8, PDI-SC-S256-2TO4, PDI-SC-S256-2TO4D, PDI-SC-S256-4TO6, PDI-SC-S256-6TO8.7, PDI-SC-S256-9.7TO10.7, PDI-SC-S263-3.8TO5.9, PDI-SC-S108-1.9TO3, PDI-SC-S108-3TO4.7, PDI-SC-S108-4.7TO6.7, PDI-SC-S108-6.7TO8.8, PDI-SC-S157-0TO2, and PDI-SC-S053-0TO2.

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

Sample	Surrogate	% Recovery
PDI-SC-S109-8TO10	4-Terphenyl-d14	123
PDI-SC-S157-6TO8MS	4-Terphenyl-d14	2

Data were not qualified based on surrogate recoveries in QC samples. Also, data were not qualified if surrogate recoveries were high or sample dilution factors were ≥50. No data were qualified for surrogate spike recoveries not meeting criteria.

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

PAHs by Method 8270D-SIM

Preparation Batch 282236				
Analyte	**LCS**	**LCSD**	**RPD**	**Control Limits (LCS / RPD)**
Acenaphthene	58%	ok	36%	64–120% / 20%
Anthracene	ok	ok	57%	46–127% / 19%

As two of the three quality control parameters (LCS, LCSD, and RPD) were acceptable for anthracene, this data was not qualified. The results for acenapthene were qualified as estimated and flagged 'UJ' in PDI-RB-SS-180816-1110 and PDI-RB-SS-180817 based on the LCS results.

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

PAHs by Method 8270D-SIM

A MS/MSD was performed using PDI-SC-S232-2to4. The percent recoveries and RPDs for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
2-Methylnapthalene	41%	ok	22%	68–120% /12%
Acenaphthene	47%	49%	ok	68–120% / 12%
Anthracene	64%	72%	ok	73–125% /12%
Benzo[a]anthracene	58%	ok	ok	66–120% / 14%
Benzo[a]pyrene	57%	ok	30%	72–124% / 12%
Benzo[g,h,i]perylene	55%	ok	38%	63–120% / 14%
Benzo[k]fluoranthene	49%	ok	35%	63–123% / 15%
Chrysene	61%	ok	13%	69–120% / 10%
Dibenz(a,h)anthracene	60%	ok	19%	70–125% / 13%
Fluoranthene	54%	ok	24%	74–125% / 13%
Fluorene	58%	63%	ok	73–120% / 13%
Indeno[1,2,3-cd]pyrene	ok	ok	28%	65–121% / 15%
Naphthalene	-165%	-140%	18%	70–120% / 12%
Phenanthrene	43%	64%	ok	73–120% / 11%
Pyrene	52%	ok	24%	70–120% / 12%

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 for benzo[a]anthracene and indeno[1,2,3-cd]pyrene, these data were not qualified. The results for 2-methylnapthalene, acenaphthene, anthracene, benzo[a]pyrene, benzo[g,h,i]perylene benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene were qualified as estimated and flagged 'J' in PDI-SC-S232-2to4 based on the MS/MSD results.

An MS/MSD was performed using PDI-SC-S157-6to8. The percent recoveries and RPDs for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
2-Methylnapthalene	ok	ok	15%	68–120% /12%
Acenaphthene	ok	ok	13%	68–120% / 12%
Fluorene	72%	ok	ok	73–120% / 13%
Naphthalene	67%	ok	18%	70–120% / 12%

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 for 2-methylnapthalene, acenaphthene, and fluorene, these data were not qualified. The result for naphthalene was qualified as estimated and flagged 'J' in PDI-SC-S157-6to8 based on the MS/MSD results.

A MS/MSD was performed using PDI-SC-S109-4to6. The percent recoveries and RPDs for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
2-Methylnapthalene	156%	122%	27%	68–120% /12%
Acenaphthene	302%	1741%	81%	68–120% / 12%
Acenaphthylene	ok	278%	60%	68–120% / 12%
Anthracene	228%	1373%	85%	73–125% /12%
Benzo[a]anthracene	165%	1173%	88%	66–120% / 14%
Benzo[a]pyrene	173%	1665%	99%	72–124% / 12%
Benzo[b]fluoranthene	191%	1660%	100%	63–121% / 10%
Benzo[g,h,i]perylene	241%	1517%	90%	63–120% / 14%
Benzo[k]fluoranthene	ok	542%	80%	63–123% / 15%
Chrysene	138%	1490%	96%	69–120% / 10%
Dibenz(a,h)anthracene	ok	327%	69%	70–125% / 13%
Fluoranthene	434%	5260%	99%	74–125% / 13%
Fluorene	271%	1081%	72%	73–120% / 13%
Indeno[1,2,3-cd]pyrene	236%	1519%	91%	65–121% / 15%
Naphthalene	335%	302%	ok	70–120% / 12%
Phenanthrene	1058%	7407%	91%	73–120% / 11%
Pyrene	503%	6249%	99%	70–120% / 12%

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

The sample results for acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, chrysene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene exceeded the spike amount by greater than 4 times, therefore no data were qualified for these analytes. The results for 2-methylnapthalene, acenaphthylene, benzo[k]fluoranthene, dibenz(a,h)anthracene, and naphthalene were qualified as estimated and flagged 'J' in PDI-SC-S109-4to6 based on the MS/MSD results.

PCBs by EPA Method 8082A

A MS/MSD was performed using PDI-SC-S263-3.8to5.9. The percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
PCB-1260	39%	44%	ok	63–130% / 25%

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

The result for PCB-1260 was qualified and flagged 'UJ' in PDI-SC-S263-3.8to5.9 based on the MS/MSD results.

A MS/MSD was performed using PDI-SC-109-4to6. The percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
PCB-1260	ok	60%	ok	63–130% / 25%

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 PCB-1260, this data was not qualified.

A MS/MSD was performed using PDI-SC-S232-2to4. The percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits(Matrix Spike / RPD)
PCB-1260	-62%	-64%	ok	63–130% / 25%

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

The result for PCB-1260 was qualified as estimated and flagged 'J' in PDI-SC-S232-2to4 based on the MS/MSD results.

7. Field Duplicate – Acceptable except as noted below:

PAHs by Method 8270D-SIM – Field duplicates were performed using PDI-SC-S256-2TO4, PDI-SC-S108-6.7TO8.8 and PDI-SC-S113(A)-2.2TO4.6. Results were comparable, except for 2-methylnaphthalene, fluorene and phenanthrene in sample PDI-SC-S113(A)-2.2TO4.6. These results have been qualified as estimated and flagged 'J'.

PCBs by EPA Method 8082A – Field duplicates were performed using PDI-SC-S256-2TO4. PDI-SC-S108-6.7TO8.8 and PDI-SC-S113(A)-2.2TO4.6. Results were comparable.

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.

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.

PAHs by Method 8270D-SIM – The following samples were diluted due to the nature of the sample matrix: PDI-SC-S113(A)-0to2.2 (580-79672-1), PDI-SC-S113(A)-2.2to4.6 (580-79672-2), PDI-SC-S113(B)-3.6to5.6 (580-79672-3), PDI-SC-S113(B)-5.6to7.4 (580-79672-4), PDI-SC-S113(B)-7.4to10 (580-79672-5), PDI-SC-S113(B)-10to12 (580-79672-6), PDI-SC-S113(B)-12to13.8 (580-79672-7), PDI-SC-S109-0to2 (580-79672-8), PDI-SC-S109-2to4 (580-79672-9), PDI-SC-S109-4TO6 (580-79672-10), PDI-SC-S109-6TO8 (PDI-SC-S109-6TO8), PDI-SC-S109-8to10 (580-79672-12), PDI-SC-S109-10TO11.3 (580-79672-13), PDI-SC-S131-0to2 (580-79672-14), PDI-SC-S131-2to4 (580-79672-15), PDI-SC-S131-4to6 (580-79672-16), PDI-SC-S131-6to8 (580-79672-17), PDI-SC-S256-0to2 (580-79672-18), PDI-SC-S256-2to4 (580-79672-19), PDI-SC-S256-2to4D (580-79672-20), PDI-SC-S256-4to6 (580-79672-21), PDI-SC-S256-6to8.7 (580-79672-22), PDI-SC-S256-8.7to9.7 (580-79672-23), PDI-SC-S256-9.7to10.7 (580-79672-24), PDI-SC-S232-0to2 (580-79672-25), PDI-SC-S232-2to4 (580-79672-26), PDI-SC-S232-2to4 (580-79672-26[MS]), PDI-SC-S232-2to4 (580-79672-26[MSD]), PDI-SC-S232-4to6.2 (580-79672-27), PDI-SC-S263-0to2 (580-79672-28), PDI-SC-S263-2to3.8 (580-79672-29), PDI-SC-S263-3.8to5.9 (580-79672-30), PDI-SC-S108-0to1.9 (580-79672-31), PDI-SC-S108-1.9to3 (580-79672-32), PDI-SC-S108-3to4.7 (580-79672-33), PDI-SC-S108-4.7to6.7 (580-79672-34), PDI-SC-S108-6.7to8.8 (580-79672-35), PDI-SC-S108-6.7to8.8D (580-79672-36), PDI-SC-S108-8.8to9.8 (580-79672-37), PDI-SC-S157-0to2 (580-79672-38), PDI-SC-S157-2to3.7 (580-79672-39), PDI-SC-S053-0to2 (580-79672-48), PDI-SC-S053-2to4 (580-79672-49), PDI-SC-S053-4to6 (580-79672-50), PDI-SC-S053-6to8 (580-79672-51), and PDI-SC-S053-8to10 (580-79672-52), PDI-SC-S053-10to12.4 (580-79672-53), and PDI-SC-S113(A)-2.2to4.6D (580-79672-54). Elevated reporting limits (RLs) are provided.

PCBs by EPA Method 8082A – Due to the matrix, the initial volume(s) and final volumes used for the following sample deviated from the standard procedure: PDI-SC-S109-10to11.3 (580-79672-13). The reporting limits (RLs) have been adjusted proportionately.

9. Calculation Checks – Acceptable

A calculation check was performed for PDI-SC-S113(A)-2.2TO4.6. The review confirmed the final results were correct as reported.

10. Other Items of Note:

PCBs by EPA Method 8082A – The %RPD between the primary and secondary column exceeded 40%. In accordance with the laboratory's standard operating procedure, the lower result was reported. The following sample results are qualified 'J' as estimated.

Sample Name	Analtye	Final Result (µg/kg)
PDI-SC-S109-6TO8	Aroclor 1260	0.47 J
PDI-SC-S113(A)-2.2TO4.6	Aroclor 1260	1.0 J
PDI-SC-S256-6TO8.7	Aroclor 1016	22 J
PDI-SC-S113(B)-12TO13.8	Aroclor 1260	2.5 J
PDI-SC-S131-4TO6	Aroclor 1254	21 J
PDI-SC-S131-6TO8	Aroclor 1254	18 J
PDI-SC-S157-2TO3.7	Aroclor 1260	1.6 J

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

PCBs by EPA Method 8082A – The laboratory noted that PDI-SC-S113(A)-2.2to4.6 (580-79672-2) and PDI-SC-S109-0to2 (580-79672-8) appeared to contain PCBs; however, due to weathering or other environmental processes, the PCBs in the samples do not closely match any of the laboratory's Aroclor standards used for instrument calibration. Do to the poor match with the Aroclor standard, there is increased qualitative and quantitative uncertainty associated with these results. The samples have been quantified and reported as PCB-1260. The results for PCB-1260 were qualified as estimated and flagged 'J' based on this identification issue.

PCBs by EPA Method 8082A – The following samples required a copper clean-up to reduce matrix interferences caused by sulfur: PDI-SC-S113(A)-0to2.2 (580-79672-1), PDI-SC-S113(A)-2.2to4.6 (580-79672-2), PDI-SC-S113(B)-3.6to5.6 (580-79672-3), PDI-SC-S113(B)-5.6to7.4 (580-79672-4), PDI-SC-S113(B)-7.4to10 (580-79672-5), PDI-SC-S113(B)-10to12 (580-79672-6), PDI-SC-S113(B)-12to13.8 (580-79672-7), PDI-SC-S109-0to2 (580-79672-8), PDI-SC-S109-2to4 (580-79672-9), PDI-SC-S109-4to6 (580-79672-10), PDI-SC-S109-4to6 (580-79672-10[MS]), PDI-SC-S109-4to6 (580-79672-10[MSD]), PDI-SC-S109-10to11.3 (580-79672-13), (LCS 580-285787/2-A), (LCSD 580-285787/3-A), (MB 580-285787/1-A), (LCS 580-285536/2-A) and (MB 580-285536/1-A).

CONVENTIONAL ANALYSES

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

1. Holding Times – Acceptable

Moisture Content at 70°C – The 7-day holding time indicated for moisture content at 70°C in the QAPP was exceeded for all samples in the laboratory group by 13 to 18 days due to an oversight by the laboratory. No data qualifiers were assigned based on the holding time exceedance.

ASTM D-2216 – The 7-day holding time indicated for total solids in the QAPP was exceeded for all samples in the laboratory group by 13 to 37 days due to an oversight by 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
08/28/2018	TOC	114 mg/kg
8/30/2018	TOC	526 mg/kg

   Notes:
   J = estimated concentration
   mg/kg = milligrams per kilogram
   TOC = total organic carbon

   TOC was detected in the associated samples at concentrations greater than the reporting limits (RLs) and greater than ten times the method blank detections; therefore, data were not qualified.

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 was performed using PDI-SC-S109-4TO6, PDI-SC-S232-2TO4, and PDI-SC-S157-6TO8. Results were acceptable.

5. Field Duplicate – Acceptable

   TOC by Method 9060 – Field duplicates were performed using PDI-SC-S256-2TO4. PDI-SC-S108-6.7TO8.8 and PDI-SC-S113(A)-2.2TO4.6. Results were comparable.

   Total Solids by Method D2216 – Field duplicates were performed using PDI-SC-S256-2TO4. PDI-SC-S108-6.7TO8.8 and PDI-SC-S113(A)-2.2TO4.6. Results were comparable.

   Moisture Content at 70°C – Field duplicates were performed using PDI-SC-S256-2TO4. PDI-SC-S108-6.7TO8.8 and PDI-SC-S113(A)-2.2TO4.6. Results were comparable.

6. Laboratory Replicate – Acceptable

   TOC by Method 9060 – Laboratory duplicates and triplicates were performed using PDI-SC-S109-4TO6, PDI-SC-S232-2TO4, and PDI-SC-S157-6TO8. Results were comparable.

   Total Solids by Method D2216 – Laboratory duplicates were performed using PDI-SC-S113(A)-0TO2.2, PDI-SC-S256-2TO4D, PDI-SC-S256-4TO6, and PDI-SC-S053-10TO12.4. Results were comparable.

   Moisture Content at 70°C – Laboratory duplicates were performed using PDI-SC-S113(B)-12TO13.8, PDI-SC-S256-2TO4D, PDI-SC-S232-0TO2, and PDI-SC-S157-10TO12.4. Results were comparable.

7. Reporting Limits – Acceptable

8. Calculation Checks – Acceptable

   A calculation check was performed for PDI-SC-S113(A)-2.2TO4.6. The review confirmed the final results were correct as reported.

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. A laboratory duplicate was performed on PDI-SC-S113(B)-12TO13.8, PDI-SC-S232-0TO2, and PDI-SC-S157-10TO12.4. Results were comparable, except for the clay fraction for sample PDI-SC-S157-10TO12.4 which was assigned an ‘L’ qualifier 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%.

OVERALL ASSESSMENT OF DATA

The data reported in this laboratory group is considered usable for meeting project objectives. The completeness for laboratory group 580-79672-1 is 100%.

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep/Nearshore Core Stations
TestAmerica Laboratory Group: 580-79672-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Final Result	Units	Reason
PDI-SC-S113(A)-0TO2.2	580-79672-1	SW8082A	Aroclor 1254	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S113(A)-2.2TO4.6	580-79672-2	SW8082A	Aroclor 1260	1.0 J	1.0 J	µg/kg	r,q
PDI-SC-S113(A)-2.2TO4.6	580-79672-2	SW8082A	Aroclor 1254	2.5 U	2.5 UJ	µg/kg	c
PDI-SC-S113(A)-2.2TO4.6	580-79672-2	SW8270DSIM	Phenanthrene	24000	24000 J	µg/kg	fd
PDI-SC-S113(A)-2.2TO4.6	580-79672-2	SW8270DSIM	Fluorene	4100	4100 J	µg/kg	fd
PDI-SC-S113(A)-2.2TO4.6	580-79672-2	SW8270DSIM	2-Methylnaphthalene	2600	2600 J	µg/kg	fd
PDI-SC-S113(B)-3.6TO5.6	580-79672-3	SW8082A	Aroclor 1254	3.9 U	3.9 UJ	µg/kg	c
PDI-SC-S113(B)-5.6TO7.4	580-79672-4	SW8082A	Aroclor 1254	3.3 U	3.3 UJ	µg/kg	c
PDI-SC-S113(B)-7.4TO10	580-79672-5	SW8082A	Aroclor 1254	2.5 U	2.5 UJ	µg/kg	c
PDI-SC-S113(B)-10TO12	580-79672-6	SW8082A	Aroclor 1254	2.4 U	2.4 UJ	µg/kg	c
PDI-SC-S113(B)-12TO13.8	580-79672-7	SW8082A	Aroclor 1260	2.5	2.5 J	µg/kg	r
PDI-SC-S113(B)-12TO13.8	580-79672-7	SW8082A	Aroclor 1254	2.5 U	2.5 UJ	µg/kg	c
PDI-SC-S109-0TO2	580-79672-8	SW8082A	Aroclor 1260	2.7	2.7 J	µg/kg	q
PDI-SC-S109-0TO2	580-79672-8	SW8082A	Aroclor 1254	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S109-2TO4	580-79672-9	SW8082A	Aroclor 1254	2.3 U	2.3 UJ	µg/kg	c
PDI-SC-S109-4TO6	580-79672-10	SW8082A	Aroclor 1254	2.3 U	2.3 UJ	µg/kg	c
PDI-SC-S109-4TO6	580-79672-10	SW8270DSIM	Benzo(k)fluoranthene	470	470 J	µg/kg	m,md
PDI-SC-S109-4TO6	580-79672-10	SW8270DSIM	Acenaphthylene	150	150 J	µg/kg	m,md
PDI-SC-S109-4TO6	580-79672-10	SW8270DSIM	Dibenz(a,h)anthracene	170	170 J	µg/kg	m,md
PDI-SC-S109-4TO6	580-79672-10	SW8270DSIM	2-Methylnaphthalene	33 J	33 J	µg/kg	m,md
PDI-SC-S109-4TO6	580-79672-10	SW8270DSIM	Naphthalene	240	240 J	µg/kg	m
PDI-SC-S109-6TO8	580-79672-11	SW8082A	Aroclor 1260	0.47 J	0.47 J	µg/kg	r
PDI-SC-S131-4TO6	580-79672-16	SW8082A	Aroclor 1254	21	21 J	µg/kg	r,c
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1260	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1221	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1232	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1248	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1016	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1242	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S131-6TO8	580-79672-17	SW8082A	Aroclor 1254	18	18 J	µg/kg	s,c,r
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1260	58	58 J	µg/kg	s
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1254	3.3 U	3.3 UJ	µg/kg	s
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1221	3.3 U	3.3 UJ	µg/kg	s
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1232	3.3 U	3.3 UJ	µg/kg	s
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1248	3.3 U	3.3 UJ	µg/kg	s
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1016	3.3 U	3.3 UJ	µg/kg	s

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep/Nearshore Core Stations
TestAmerica Laboratory Group: 580-79672-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Final Result	Units	Reason
PDI-SC-S256-2TO4	580-79672-19	SW8082A	Aroclor 1242	3.3 U	3.3 UJ	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1260	59	59 J	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1254	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1221	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1232	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1248	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1016	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-2TO4D	580-79672-20	SW8082A	Aroclor 1242	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1260	70	70 J	µg/kg	s
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1254	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1221	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1232	3.1 U	3.1 UJ	µg/kg	s,c
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1248	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1016	7.6	7.6 J	µg/kg	s
PDI-SC-S256-4TO6	580-79672-21	SW8082A	Aroclor 1242	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1260	190	190 J	µg/kg	s
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1254	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1221	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1232	3.1 U	3.1 UJ	µg/kg	s,c
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1248	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1016	22	22 J	µg/kg	s,r
PDI-SC-S256-6TO8.7	580-79672-22	SW8082A	Aroclor 1242	3.1 U	3.1 UJ	µg/kg	s
PDI-SC-S256-8.7TO9.7	580-79672-23	SW8082A	Aroclor 1232	3.2 U	3.2 UJ	µg/kg	c
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1260	20	20 J	µg/kg	s
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1254	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1221	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1232	3.2 U	3.2 UJ	µg/kg	s,c
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1248	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1016	4.9	4.9 J	µg/kg	s
PDI-SC-S256-9.7TO10.7	580-79672-24	SW8082A	Aroclor 1242	3.2 U	3.2 UJ	µg/kg	s
PDI-SC-S232-0TO2	580-79672-25	SW8082A	Aroclor 1232	3.3 U	3.3 UJ	µg/kg	c
PDI-SC-S232-2TO4	580-79672-26	SW8082A	Aroclor 1260	48	48 J	µg/kg	m
PDI-SC-S232-2TO4	580-79672-26	SW8082A	Aroclor 1232	3.5 U	3.5 UJ	µg/kg	c
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Anthracene	110	110 J	µg/kg	m
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Pyrene	550	550 J	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Benzo(g,h,i)perylene	110	110 J	µg/kg	m,md

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QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep/Nearshore Core Stations
TestAmerica Laboratory Group: 580-79672-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Final Result	Units	Reason
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Fluoranthene	470	470 J	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Benzo(k)fluoranthene	41	41 J	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Acenaphthene	230	230 J	µg/kg	m
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Chrysene	180	180 J	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Benzo(a)pyrene	97	97 J	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Dibenz(a,h)anthracene	15 U	15 UJ	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Phenanthrene	590	590 J	µg/kg	m
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Fluorene	150	150 J	µg/kg	m
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	Naphthalene	1200	1200 J	µg/kg	m,md
PDI-SC-S232-2TO4	580-79672-26	SW8270DSIM	2-Methylnaphthalene	260	260 J	µg/kg	m,md
PDI-SC-S232-4TO6.2	580-79672-27	SW8082A	Aroclor 1232	2.9 U	2.9 UJ	µg/kg	c
PDI-SC-S263-0TO2	580-79672-28	SW8082A	Aroclor 1232	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S263-2TO3.8	580-79672-29	SW8082A	Aroclor 1232	2.9 U	2.9 UJ	µg/kg	c
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1260	4.8	4.8 J	µg/kg	s,c,m
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1254	3.0 U	3.0 UJ	µg/kg	s,c
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1221	3.0 U	3.0 UJ	µg/kg	s
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1232	3.0 U	3.0 UJ	µg/kg	s
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1248	3.0 U	3.0 UJ	µg/kg	s,c
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1016	3.0 U	3.0 UJ	µg/kg	s
PDI-SC-S263-3.8TO5.9	580-79672-30	SW8082A	Aroclor 1242	3.0 U	3.0 UJ	µg/kg	s,c
PDI-SC-S108-0TO1.9	580-79672-31	SW8082A	Aroclor 1260	66	66 J	µg/kg	c
PDI-SC-S108-0TO1.9	580-79672-31	SW8082A	Aroclor 1254	3.7 U	3.7 UJ	µg/kg	c
PDI-SC-S108-0TO1.9	580-79672-31	SW8082A	Aroclor 1248	3.7 U	3.7 UJ	µg/kg	c
PDI-SC-S108-0TO1.9	580-79672-31	SW8082A	Aroclor 1242	3.7 U	3.7 UJ	µg/kg	c
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1260	42	42 J	µg/kg	s,c
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1254	4.4 U	4.4 UJ	µg/kg	s,c
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1221	4.4 U	4.4 UJ	µg/kg	s
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1232	4.4 U	4.4 UJ	µg/kg	s
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1248	4.4 U	4.4 UJ	µg/kg	s,c
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1016	4.4 U	4.4 UJ	µg/kg	s
PDI-SC-S108-1.9TO3	580-79672-32	SW8082A	Aroclor 1242	4.4 U	4.4 UJ	µg/kg	s,c
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1260	19	19 J	µg/kg	s,c
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1254	4.6 U	4.6 UJ	µg/kg	s,c
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1221	4.6 U	4.6 UJ	µg/kg	s
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1232	4.6 U	4.6 UJ	µg/kg	s
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1248	4.6 U	4.6 UJ	µg/kg	s,c

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep/Nearshore Core Stations
TestAmerica Laboratory Group: 580-79672-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Final Result	Units	Reason
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1016	4.6 U	4.6 UJ	µg/kg	s
PDI-SC-S108-3TO4.7	580-79672-33	SW8082A	Aroclor 1242	4.6 U	4.6 UJ	µg/kg	s,c
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1260	4.7	4.7 J	µg/kg	s,c
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1254	4.0 U	4.0 UJ	µg/kg	s,c
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1221	4.0 U	4.0 UJ	µg/kg	s
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1232	4.0 U	4.0 UJ	µg/kg	s
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1248	4.0 U	4.0 UJ	µg/kg	s,c
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1016	4.0 U	4.0 UJ	µg/kg	s
PDI-SC-S108-4.7TO6.7	580-79672-34	SW8082A	Aroclor 1242	4.0 U	4.0 UJ	µg/kg	s,c
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1260	2.8 U	2.8 UJ	µg/kg	s,c
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1254	2.8 U	2.8 UJ	µg/kg	s,c
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1221	2.8 U	2.8 UJ	µg/kg	s
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1232	2.8 U	2.8 UJ	µg/kg	s
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1248	2.8 U	2.8 UJ	µg/kg	s,c
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1016	2.8 U	2.8 UJ	µg/kg	s
PDI-SC-S108-6.7TO8.8	580-79672-35	SW8082A	Aroclor 1242	2.8 U	2.8 UJ	µg/kg	s,c
PDI-SC-S108-6.7TO8.8D	580-79672-36	SW8082A	Aroclor 1232	2.8 U	2.8 UJ	µg/kg	c
PDI-SC-S108-8.8TO9.8	580-79672-37	SW8082A	Aroclor 1260	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S108-8.8TO9.8	580-79672-37	SW8082A	Aroclor 1254	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S108-8.8TO9.8	580-79672-37	SW8082A	Aroclor 1248	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S108-8.8TO9.8	580-79672-37	SW8082A	Aroclor 1242	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1260	1.2 J	1.2 J	µg/kg	s,c
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1254	4.0 U	4.0 UJ	µg/kg	s,c
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1221	4.0 U	4.0 UJ	µg/kg	s
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1232	4.0 U	4.0 UJ	µg/kg	s
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1248	4.0 U	4.0 UJ	µg/kg	s,c
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1016	4.0 U	4.0 UJ	µg/kg	s
PDI-SC-S157-0TO2	580-79672-38	SW8082A	Aroclor 1242	4.0 U	4.0 UJ	µg/kg	s,c
PDI-SC-S157-2TO3.7	580-79672-39	SW8082A	Aroclor 1260	1.6 J	1.6 J	µg/kg	c,r
PDI-SC-S157-2TO3.7	580-79672-39	SW8082A	Aroclor 1254	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-2TO3.7	580-79672-39	SW8082A	Aroclor 1248	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-2TO3.7	580-79672-39	SW8082A	Aroclor 1242	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-3.7TO6	580-79672-40	SW8082A	Aroclor 1260	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-3.7TO6	580-79672-40	SW8082A	Aroclor 1254	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-3.7TO6	580-79672-40	SW8082A	Aroclor 1248	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-3.7TO6	580-79672-40	SW8082A	Aroclor 1242	2.7 U	2.7 UJ	µg/kg	c

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep/Nearshore Core Stations
TestAmerica Laboratory Group: 580-79672-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Final Result	Units	Reason
PDI-SC-S157-6TO8	580-79672-41	SW8082A	Aroclor 1232	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-6TO8	580-79672-41	SW8270DSIM	Benzo(k)fluoranthene	0.92 J	1.3 U	µg/kg	bl
PDI-SC-S157-6TO8	580-79672-41	SW8270DSIM	Naphthalene	1.5	1.5 J	µg/kg	m,md
PDI-SC-S157-8TO10	580-79672-42	SW8082A	Aroclor 1260	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-8TO10	580-79672-42	SW8082A	Aroclor 1254	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-8TO10	580-79672-42	SW8082A	Aroclor 1248	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-8TO10	580-79672-42	SW8082A	Aroclor 1242	2.7 U	2.7 UJ	µg/kg	c
PDI-SC-S157-10TO12.4	580-79672-43	D7928/D6913	Clay	5.3	5.3 L	%	ld
PDI-SC-S157-10TO12.4	580-79672-43	SW8082A	Aroclor 1260	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-10TO12.4	580-79672-43	SW8082A	Aroclor 1254	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-10TO12.4	580-79672-43	SW8082A	Aroclor 1248	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-10TO12.4	580-79672-43	SW8082A	Aroclor 1242	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-12.4TO14	580-79672-44	SW8082A	Aroclor 1260	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-12.4TO14	580-79672-44	SW8082A	Aroclor 1254	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-12.4TO14	580-79672-44	SW8082A	Aroclor 1248	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-12.4TO14	580-79672-44	SW8082A	Aroclor 1242	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-14TO15.9	580-79672-45	SW8082A	Aroclor 1260	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-14TO15.9	580-79672-45	SW8082A	Aroclor 1254	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-14TO15.9	580-79672-45	SW8082A	Aroclor 1248	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-14TO15.9	580-79672-45	SW8082A	Aroclor 1242	2.6 U	2.6 UJ	µg/kg	c
PDI-SC-S157-14TO15.9	580-79672-45	SW8270DSIM	Fluoranthene	1.1 J	1.3 U	µg/kg	bl
PDI-RB-SS-180816-1110	580-79672-46	SW8082A	Aroclor 1221	0.45 U	0.45 UJ	µg/L	c
PDI-RB-SS-180816-1110	580-79672-46	SW8270DSIM	Acenaphthene	0.098 U	0.098 UJ	µg/L	l
PDI-RB-SS-180817	580-79672-47	SW8082A	Aroclor 1221	0.46 U	0.46 UJ	µg/L	c
PDI-RB-SS-180817	580-79672-47	SW8270DSIM	Acenaphthene	0.10 U	0.10 UJ	µg/L	l
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1260	1.5 J	1.5 J	µg/kg	s,c
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1254	3.7 U	3.7 UJ	µg/kg	s,c
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1221	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1232	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1248	3.7 U	3.7 UJ	µg/kg	s,c
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1016	3.7 U	3.7 UJ	µg/kg	s
PDI-SC-S053-0TO2	580-79672-48	SW8082A	Aroclor 1242	3.7 U	3.7 UJ	µg/kg	s,c
PDI-SC-S053-2TO4	580-79672-49	SW8082A	Aroclor 1260	19	19 J	µg/kg	c
PDI-SC-S053-2TO4	580-79672-49	SW8082A	Aroclor 1254	3.3 U	3.3 UJ	µg/kg	c
PDI-SC-S053-2TO4	580-79672-49	SW8082A	Aroclor 1248	3.3 U	3.3 UJ	µg/kg	c
PDI-SC-S053-2TO4	580-79672-49	SW8082A	Aroclor 1242	3.3 U	3.3 UJ	µg/kg	c

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Deep/Nearshore Core Stations
TestAmerica Laboratory Group: 580-79672-1

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Final Result	Units	Reason
PDI-SC-S053-4TO6	580-79672-50	SW8082A	Aroclor 1260	5.2	5.2 J	µg/kg	c
PDI-SC-S053-4TO6	580-79672-50	SW8082A	Aroclor 1232	3.1 U	3.1 UJ	µg/kg	c
PDI-SC-S053-4TO6	580-79672-50	SW8082A	Aroclor 1248	3.1 U	3.1 UJ	µg/kg	c
PDI-SC-S053-4TO6	580-79672-50	SW8082A	Aroclor 1242	3.1 U	3.1 UJ	µg/kg	c
PDI-SC-S053-6TO8	580-79672-51	SW8082A	Aroclor 1232	3.0 U	3.0 UJ	µg/kg	c
PDI-SC-S053-6TO8	580-79672-51	SW8082A	Aroclor 1248	3.0 U	3.0 UJ	µg/kg	c
PDI-SC-S053-6TO8	580-79672-51	SW8082A	Aroclor 1242	3.0 U	3.0 UJ	µg/kg	c
PDI-SC-S053-8TO10	580-79672-52	SW8082A	Aroclor 1232	2.8 U	2.8 UJ	µg/kg	c
PDI-SC-S053-8TO10	580-79672-52	SW8082A	Aroclor 1248	2.8 U	2.8 UJ	µg/kg	c
PDI-SC-S053-8TO10	580-79672-52	SW8082A	Aroclor 1242	2.8 U	2.8 UJ	µg/kg	c
PDI-SC-S053-10TO12.4	580-79672-53	SW8082A	Aroclor 1232	2.9 U	2.9 UJ	µg/kg	c
PDI-SC-S053-10TO12.4	580-79672-53	SW8082A	Aroclor 1248	2.9 U	2.9 UJ	µg/kg	c
PDI-SC-S053-10TO12.4	580-79672-53	SW8082A	Aroclor 1242	2.9 U	2.9 UJ	µg/kg	c
PDI-SC-S113(A)-2.2TO4.6D	580-79672-54	SW8082A	Aroclor 1232	2.5 U	2.5 UJ	µg/kg	c
PDI-SC-S113(A)-2.2TO4.6D	580-79672-54	SW8270DSIM	Phenanthrene	11000	11000 J	µg/kg	fd
PDI-SC-S113(A)-2.2TO4.6D	580-79672-54	SW8270DSIM	Fluorene	2200	2200 J	µg/kg	fd
PDI-SC-S113(A)-2.2TO4.6D	580-79672-54	SW8270DSIM	2-Methylnaphthalene	280	280 J	µg/kg	fd

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