

Data Validation Report

Project: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling
 Portland Harbor Superfund Site
 Subsurface Sediment – Nearshore Core Stations

Laboratory: TestAmerica Laboratories, Incorporated, Seattle, WA

Laboratory Groups: 580-81298-1 and 580-81298-4

Analyses/Method: Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs),
 Total Organic Carbon (TOC), Total Solids, and Grain Size

Validation Level: Stage 2

AECOM Project

Number: 60566335, Task #2.12

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SUMMARY

The data quality review of 2 subsurface sediment samples collected on July 24 and July 26, 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 Celsius (°C), and grain size by ASTM Method D7928/D6913 by TestAmerica Laboratories, Incorporated (TA) located in Tacoma, Washington. 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 groups 580-81298-1 and 580-81298-4:

Sample ID	Laboratory ID
PDI-SC-S154-4to6	580-81298-1
PDI-SC-S185-5to6.5	580-81298-2

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 cooler was received at a temperature within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C. Both samples in this laboratory group were frozen at the field warehouse after sample collection on 7/26/18 until they were shipped to TA on 10/24/18. TA froze the samples upon receipt to extend holding times until they were thawed for analysis. The grain size containers were not included in the shipment to TA on 10/24/18, AECOM was notified, and the containers were shipped on 10/26/18. The rush grain size

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results were reported in laboratory group 580-81298-4 on 11/8/18. The other results were reported in laboratory group 580-81298-1 on 11/15/18.

ORGANIC ANALYSES

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

1. Holding Times – Acceptable
2. Blanks – Acceptable except as noted below:

General – A rinsate blank was not submitted with this laboratory group. Associated rinsate blanks are reported under separate cover. Target compounds may have been detected in the rinsate blanks associated with these samples. Sediment data were not qualified based on rinsate blank results.

PAHs by Method 8270D-SIM – 2-Methylnaphthalene (0.150 ug/kg), acenaphthene (0.183 ug/kg), naphthalene (0.288 ug/kg), and phenanthrene (0.338 ug/kg) were detected in the method blank associated with prep batch 288111 at concentrations between the method detection limits (MDLs) and reporting limits. 2-Methylnaphthalene, acenaphthene, naphthalene, and phenanthrene were detected at concentrations between the MDLs and the reporting limits in PDI-SC-S185-5to6.5. This sample was diluted prior to analysis and therefore reported with elevated reporting limits; therefore, these results were qualified as estimated and flagged ‘J’ based on the method blank results. Phenanthrene was detected at a concentration between the MDL and the reporting limit in PDI-SC-S154-4to6; therefore, phenanthrene was qualified as not detected and flagged ‘U’ at the reporting limit in PDI-SC-S154-4to6.

3. Surrogates – Acceptable
4. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable
5. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable except as noted below:

PAHs by Method 8270D-SIM – An MS/MSD was performed using PDI-SC-S154-4to6. The percent recoveries for the following analytes were outside of the control limits:

Analyte	MS	MSD	RPD	Control Limits (Matrix Spike / RPD)
Acenaphthylene	ok	ok	14%	68-120% / 12%
Anthracene	ok	ok	25%	73-125% / 12%
Benzo[a]pyrene	ok	70%	23%	72-124% / 12%
Benzo[b]fluoranthene	ok	ok	13%	63-121% / 10%

ok – acceptable

As two out of the three quality control parameters (MS, MSD, and relative percent difference [RPD]) were acceptable, data were not qualified for acenaphthylene, anthracene, and benzo[b]fluoranthene. The result for benzo[a]pyrene was qualified as estimated and flagged ‘J’ in PDI-SC-S154-4to6 based on the MS/MSD results.

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PCBs by EPA Method 8082A – An MS/MSD was not performed using a sample from this laboratory group. Accuracy and precision were assessed using the LCS/LCSD.

6. Reporting Limits and Chromatographic Review – Acceptable

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/spectra were reviewed to confirm target analytes were properly identified. The review confirmed target analytes were properly identified and reported by the laboratory.

7. Other Items of Note:

PCBs by EPA Method 8082A – The laboratory noted that both samples in this laboratory group required a copper clean-up to reduce matrix interferences caused by sulfur.

The percent differences (%D) for one or more peaks for the following analytes were outside the control limits of $\pm 20\%$ in the continuing calibration verification (CCV) associated with analytical batch 288312 as listed below:

Analyte	Column 1 %D	Column 2 %D
PCB-1232	high	low
PCB-1248	high/low	ok
PCB-1242	high	ok
PCB-1016	high/low	low
PCB-1260	high	ok

ok - acceptable

Both samples in this laboratory group were reported from column 1. PCB-1232 and PCB-1242 were not detected in the associated samples; therefore, data were not qualified based on these high CCV %Ds. The results for PCB-1260 in PDI-SC-S185-5to6.5 and PCB-1248 and PCB-1016 in PDI-SC-S154-4to6 and PDI-SC-S185-5to6.5 were qualified as estimated and flagged 'J' or 'UJ' based on these CCV %Ds.

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:

Total Solids by ASTM Method D-2216/Moisture Content at 70°C – The 7-day holding time indicated for total solids in the QAPP was exceeded for both samples in this laboratory group by 88-101 days. No data qualifiers were assigned based on these holding time exceedances.

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

TOC by EPA Method 9060 – A rinsate blank was not submitted with this laboratory group. Associated rinsate blanks are reported under separate cover. Target compounds may have been detected in the rinsate blanks associated with these samples. Sediment data were not qualified based on rinsate blank results.

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

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

TOC by Method 9060 – An MS/MSD was not performed using a sample from this laboratory group. Accuracy and precision were assessed using the LCS/LCSD.

5. Laboratory Replicate

General – Laboratory duplicates were not performed using a sample from this laboratory group. Precision was not assessed using a sample from this laboratory group.

6. Reporting Limits – Acceptable

TOC by Method 9060 – The result for TOC in PDI-SC-S154-4to6 was reported at a concentration between the reporting limit and the MDL and was flagged 'J' by the laboratory. As described above, laboratory 'J'-flagged results are considered estimated results.

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. As indicated under sample receipt, the sample volume used for grain size analysis was frozen until shipped to TA. No data qualifiers were assigned to grain size results based on sample condition.

1. Laboratory Duplicate

The laboratory performed duplicate analysis at a rate of 1 per 20 samples per their internal requirements. A laboratory duplicate was not performed on a sample from this laboratory group.

OVERALL ASSESSMENT OF DATA

The data reported in this laboratory group, as qualified, is considered usable for meeting project objectives. The completeness for laboratory groups 580-81298-1 and 580-81298-4 is 100%.

Table 1
QA/QC Data Summary Review
Portland Harbor
Subsurface Sediment - Nearshore Core Stations
TestAmerica Laboratory Groups: 580-81298-1 and 580-81298-4

Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
PDI-SC-S154-4TO6	580-81298-1	SW8082A	Aroclor 1248	2.6 U	ug/kg	2.6 UJ	c
PDI-SC-S154-4TO6	580-81298-1	SW8082A	Aroclor 1016	2.6 U	ug/kg	2.6 UJ	c
PDI-SC-S154-4TO6	580-81298-1	SW8270DSIM	Benzo(a)pyrene	1.3 U	ug/kg	1.3 UJ	m,md
PDI-SC-S154-4TO6	580-81298-1	SW8270DSIM	Phenanthrene	0.69 J	ug/kg	1.3 U	bl
PDI-SC-S185-5TO6.5	580-81298-2	SW8082A	Aroclor 1260	1.7 J	ug/kg	1.7 J	c
PDI-SC-S185-5TO6.5	580-81298-2	SW8082A	Aroclor 1248	2.7 U	ug/kg	2.7 UJ	c
PDI-SC-S185-5TO6.5	580-81298-2	SW8082A	Aroclor 1016	2.7 U	ug/kg	2.7 UJ	c
PDI-SC-S185-5TO6.5	580-81298-2	SW8270DSIM	Acenaphthene	1.2 J	ug/kg	1.2 J	bl
PDI-SC-S185-5TO6.5	580-81298-2	SW8270DSIM	Phenanthrene	5.6 J	ug/kg	5.6 J	bl
PDI-SC-S185-5TO6.5	580-81298-2	SW8270DSIM	Naphthalene	3.6 J	ug/kg	3.6 J	bl
PDI-SC-S185-5TO6.5	580-81298-2	SW8270DSIM	2-Methylnaphthalene	2.1 J	ug/kg	2.1 J	bl

Notes:

bl - laboratory blank contamination

c - calibration issue

J - estimated value

m - matrix spike recovery

md - matrix spike/matrix spike duplicate relative percent difference

U - compound was analyzed for, but not detected above the value shown.

ug/kg - microgram per kilogram

Note: Line items where the laboratory result contains a "J" and the final result contains a "U" with a data validation reason code "bl" indicate that the final result is reported as not detected ("U" flag) at the reporting limit.