

Data Validation Report

Project:	Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland Harbor Superfund Site Surface Sediment – Stratified Random	
Laboratory:	TestAmerica Laboratories, Incorporated, Seattle, WA	
Laboratory Group:	580-76388-1	
Analyses:	Petroleum Hydrocarbons, Metals, Total Organic Carbon (TOC), Total Solids, and Grain Size	
Validation Level:	Stage 4	
AECOM Project Number:	60566335, Task #2.12	
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Reviewed by:	Jennifer Garner/AECOM	File Name: 580-76388-1 DVR

SUMMARY

The data quality review of 14 surface sediment samples collected between April 4 and April 5, 2018, has been completed. Samples were analyzed for total petroleum hydrocarbons (TPHs, diesel-range and motor oil-range) by Washington State Department of Ecology (Ecology) Method NWTPH-Dx, metals by United States Environmental Protection Agency (EPA) Method 6020B (arsenic, cadmium, copper, lead, and zinc), mercury by EPA Method 7471A, TOC by EPA Method 9060, total solids by American Society for Testing and Materials (ASTM) Method D-2216, 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)*, Ecology's *Analytical Methods for Petroleum Hydrocarbons*, June 1997, 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 580-76388-1:

Sample ID	Laboratory ID
PDI-SG-B049-BL1	580-76388-1
PDI-SG-B048-BL1	580-76388-2
PDI-SG-B047-BL1	580-76388-3
PDI-SG-B051-BL1	580-76388-4
PDI-SG-B050-BL1	580-76388-5
PDI-SG-B055-BL1	580-76388-6
PDI-SG-B052-BL1	580-76388-7
PDI-SG-B053-BL1	580-76388-8
PDI-SG-B057-BL1	580-76388-9
PDI-SG-B056-BL1	580-76388-10
PDI-SG-B058-BL1	580-76388-11
PDI-SG-B060-BL1	580-76388-12
PDI-SG-B060-BL1-D (Field Duplicate of PDI-SG-B060-BL1)	580-76388-13
PDI-SG-B061-BL1	580-76388-14



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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 this sample set are included in Table 1.

SAMPLE RECEIPT

Upon receipt by TA, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperatures were recorded. No discrepancies with sample identification were noted by TA. 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 TPHs by NWTPH-Dx.

1. Holding Times – Acceptable

Samples PDI-SG-B048-BL1, PDI-SG-B055-BL1, PDI-SG-B052-BL1, and PDI-SG-B053-BL1 were placed in freezer storage on April 14, 2018. At the direction of AECOM, the laboratory removed the samples from freezer storage, thawed the samples, and continued with analysis on April 20, 2018. The samples were prepared and analyzed within recommended holding times indicated in the QAPP.

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

The laboratory noted that the percent difference (%D) for the surrogate o-terphenyl (-17.4%) was outside the method limits of $\pm 15\%$ in the continuing calibration verification (CCV) associated with analytical batch 272110. The o-terphenyl surrogate recoveries in the samples associated with this CCV were acceptable; therefore, data were not qualified based on the surrogate %D.

3. Blanks – Acceptable

A rinsate blank was collected on April 11, 2018, was reported with laboratory group 580-76634 (laboratory ID 580-76634-23), and is applicable to the samples reported in this laboratory group. TPHs were not detected in this rinsate blank.

4. Surrogates – Acceptable

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

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

An MS/MSD was performed using PDI-SG-B047-BL1. The percent recovery for motor oil-range hydrocarbons in the MSD (67%) was below the control limits of 70-119%. As the percent recovery in the MS and the relative percent difference (RPD) for the MS/MSD pair were acceptable, data were not qualified for motor oil-range hydrocarbons based on the MSD recovery.

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7. Field Duplicate – Acceptable

A field duplicate was submitted for PDI-SG-B060-BL1 and identified as PDI-SG-B060-BL1-D. Results were comparable.

8. Laboratory Duplicate – Acceptable

A laboratory duplicate was performed using PDI-SG-B058-BL1. Results were comparable.

9. Calculation Checks – Acceptable

A calculation check was performed for sample results on one sample per calibration. The review confirmed the final results were correct as reported.

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

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

The laboratory indicated that the diesel-range hydrocarbon elution patterns were later than the typical diesel pattern in PDI-SG-B049-BL1, PDI-SG-B047-BL1, PDI-SG-B051-BL1, PDI-SG-B055-BL1, PDI-SG-B052-BL1, PDI-SG-B053-BL1, PDI-SG-B056-BL1, PDI-SG-B058-BL1, PDI-SG-B060-BL1, PDI-SG-B060-BL1-D, and PDI-SG-B061-BL1.

Analyte concentrations detected between the method detection limit (MDL) and the reporting limit are reported by the laboratory with a 'J' flag. One or more results were flagged 'J' by the laboratory. Laboratory 'J'-flagged results are considered estimated results. As the result is between the MDL and the reporting limit, there is a greater level of uncertainty associated with the numerical result.

The reporting limits for one or more TPHs reported as not detected in multiple samples were elevated due to the moisture content of the samples. The elevated reporting limits did not exceed the cleanup levels.

METALS ANALYSES

Samples were analyzed for metals by the methods identified in the introduction to this report.

1. Holding Times – Acceptable

2. ICP-MS Instrument Performance Check & Tuning (where applicable) – Acceptable

3. Initial and Continuing Calibrations and Quantitation Limit Check Standard – Acceptable

4. Blanks – Acceptable except as noted below:

General – A rinsate blank was collected on April 11, 2018, was reported with laboratory group 580-76634 (laboratory ID 580-76634-23), and is applicable to the samples reported in this laboratory group. Arsenic (0.00041 mg/L), copper (0.00089 mg/L) and zinc (0.0027 mg/L) were detected in this rinsate blank at concentrations below the reporting limits but above the MDLs. Data were not qualified based on rinsate blank results.



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5. Internal Standards – Acceptable
6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) - Acceptable
7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) and Post Digestion Spike (PDS, where applicable) – Acceptable except as noted below:

Metals by Method 6020B – An MS/MSD and PDS were performed using PDI-SG-B047-BL1. The percent recovery for copper in the MSD (129%) exceeded the control limits of 80-120%. As the percent recovery in the MS and the RPD for the MS/MSD pair were acceptable, data were not qualified for copper based on the MSD recovery.

Mercury by Method 7471A – An MS/MSD was performed using PDI-SG-B047-BL1. Results were acceptable.

8. Field Duplicate – Acceptable

General – A field duplicate was submitted for PDI-SG-B060-BL1 and identified as PDI-SG-B060-BL1-D. Results were comparable.

9. Laboratory Duplicate – Acceptable

Metals by Method 6020B – A laboratory duplicate was performed using PDI-SG-B047-BL1. Results were comparable.

Mercury by Method 7471A – A laboratory duplicate was performed using PDI-SG-B047-BL1. The RPD for mercury (24%) exceeded the control limit of 20%. The sample concentration for mercury was less than 5x the reporting limit and the absolute difference for mercury between the parent sample concentration and laboratory duplicate concentration was less than 2x the reporting limit; therefore, data were not qualified based on the elevated laboratory duplicate RPD.

10. Serial Dilution – Acceptable

Metals by Method 6020B – A serial dilution was performed using PDI-SG-B049-BL1. Results were comparable.

11. ICP Interference Check Samples – Acceptable

12. Calculation Checks – Acceptable

General – A calculation check was performed for sample results on one sample per calibration. The review confirmed the final results were correct as reported.

13. Reporting Limits – Acceptable

General – One or more results in multiple samples were reported at concentrations between the reporting limit and the MDL and were flagged 'J' by the laboratory. As described above, laboratory 'J'-flagged results are considered estimated results.

CONVENTIONAL ANALYSES

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



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1. Holding Times – Acceptable
2. Initial and Continuing Calibrations – Acceptable where applicable
3. Blanks – Acceptable where applicable, except as noted below:

Laboratory method blanks and continuing calibration blanks were analyzed with the samples, as appropriate. All blanks were free of contamination.

TOC by Method 9060 – A rinsate blank was collected on April 11, 2018, was reported with laboratory group 580-76634 (laboratory ID 580-76634-23), and is applicable to the samples reported in this laboratory group. TOC (0.49 mg/L) was detected in this rinsate blank at a concentration below the reporting limit but above the MDL. Data were not qualified based on rinsate blank concentrations.

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

TOC by Method 9060 – An MS/MSD was performed using PDI-SG-B047-BL1. Results were acceptable.

6. Field Duplicate – Acceptable

A field duplicate was submitted for PDI-SG-B060-BL1 and identified as PDI-SG-B060-BL1-D. Results were comparable.

7. Laboratory Replicate – Acceptable

TOC by Method 9060 – A laboratory duplicate and triplicate were performed using PDI-SG-B047-BL1. Results were comparable.

Total Solids by ASTM Method D-2216 – A laboratory duplicate was not performed in association with this analysis. Laboratory precision was not assessed.

8. Calculation Checks – Acceptable

A calculation check was performed for sample results on one sample per calibration for TOC and one sample for total solids. The review confirmed the final results were correct as reported.

9. Reporting Limits – Acceptable except as noted below:

TOC by Method 9060 – TOC was reported at a concentration between the MDL and the reporting limit in PDI-SG-B050-BL1 and qualified '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



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reported for each sample. The raw data was reviewed to confirm that the reported grain size fractions were correct based on the particle size data.

1. Laboratory Duplicate – Acceptable

The laboratory performed duplicate analysis at a rate of 1 per 20 samples per their internal requirements. A laboratory duplicate was performed on PDI-SG-B061-BL1. Results were comparable.

OVERALL ASSESSMENT OF DATA

The data reported in this laboratory group, as qualified, is considered usable for meeting project objectives. The completeness for laboratory group 580-76388-1 is 100%.

Table 1
QA/QC Data Summary Review
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Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
No data qualifiers were assigned to results reported in 580-76388-1 based on this data validation.							