

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-78153-2

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

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7/13/2018 2:56:10 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page	1
Table of Contents	2
Case Narrative	3
Definitions	5
Client Sample Results	6
QC Sample Results	16
Chronicle	27
Certification Summary	29
Sample Summary	30
Chain of Custody	31
Receipt Checklists	35
Field Data Sheets	38
Isotope Dilution Summary	42



Case Narrative

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Job ID: 580-78153-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-78153-2

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Ten samples were received on 06/18/2018; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 3.4° C, 5.1° C and 5.3° C.

A sample container was provided to be archive frozen at the TestAmerica Sacramento laboratory pending potential additional analysis.

This report contains results of Dioxins/Furans by Method 1613B, performed by TestAmerica Sacramento.

The following sample was activated by the client for PAH, BEHP and TBT on 7/2/18: PDI-SG-B030-BL1 (580-78153-7). The request for additional analysis was originally requested on job 580-78380 and a frozen container was received. This container was broken in the lab and there was no salvagable sample volume. The client is aware the sample is out of hold for all analysis.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

DIOXIN/ FURAN

Samples PDI-SG-B301-BL1 (580-78153-1), PDI-SG-B297-BL1 (580-78153-2), PDI-SG-B293-BL1 (580-78153-3), PDI-SG-B310-BL1 (580-78153-4), PDI-SG-B309-BL1 (580-78153-5), PDI-SG-B314-BL1 (580-78153-6), PDI-SG-B030-BL1 (580-78153-7), PDI-SG-B031-BL1 (580-78153-8) and PDI-SG-B042-BL1 (580-78153-9) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/21/2018, 06/22/2018 and 07/03/2018 and analyzed on 06/27/2018, 06/28/2018, 07/05/2018, 07/06/2018 and 07/10/2018.

Several analytes were detected in method blanks MB 320-230306/1-A, MB 320-230501/1-A and 320-232323/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 4D5 exceeded this criteria: (CCV 320-231207/2), (LCS 320-230306/2-A), (LCS 320-230306/3-A), (MB 320-230306/1-A) and (WDM 320-231207/1). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Case Narrative

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Job ID: 580-78153-2 (Continued)

Laboratory: TestAmerica Seattle (Continued)

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 4D5 exceeded this criteria: PDI-SG-B301-BL1 (580-78153-1), PDI-SG-B293-BL1 (580-78153-3) and (CCV 320-231356/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SG-B309-BL1 (580-78153-5), PDI-SG-B314-BL1 (580-78153-6), PDI-SG-B030-BL1 (580-78153-7), PDI-SG-B031-BL1 (580-78153-8) and (CCV 320-231552/14). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SG-B293-BL1 (580-78153-3), (CCV 320-233354/1), (LCS 320-232323/2-A), (LCSD 320-232323/3-A), (MB 320-232323/1-A) and (WDM 320-233354/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Dioxin Prep

Method(s) HRMS-Sox: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-B301-BL1 (580-78153-1), PDI-SG-B293-BL1 (580-78153-3), PDI-SG-B309-BL1 (580-78153-5), PDI-SG-B314-BL1 (580-78153-6), PDI-SG-B030-BL1 (580-78153-7) and PDI-SG-B031-BL1 (580-78153-8). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-230306.

Method(s) HRMS-Sox: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-B297-BL1 (580-78153-2), PDI-SG-B310-BL1 (580-78153-4) and PDI-SG-B042-BL1 (580-78153-9). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-230501.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIOXIN/ FURAN

Sample PDI-RB-VV-20160616 (580-78153-10) was analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/20/2018 and analyzed on 06/27/2018.

The method blank for preparation batch 320-229950 contained 1,2,3,4,6,7,8-HpCDF and OCDD above the reporting limit (RL). Several analytes were also detected above the method detection limit. None of the samples associated with this method blank contained the target compound over the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples were not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM

TestAmerica Job ID: 580-78153-2

Project/Site: Portland Harbor Pre-Remedial Design

Qualifiers

Dioxin

Qualifier	Qualifier Description
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B301-BL1

Lab Sample ID: 580-78153-1

Date Collected: 06/15/18 16:20

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 50.7

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.054		0.0049	0.00060	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,4,6,7,8-HpCDF	0.012	q	0.0049	0.00041	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,4,7,8,9-HpCDF	0.0012	J B	0.0049	0.00050	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,4,7,8-HxCDD	0.00094	J	0.0049	0.00013	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,4,7,8-HxCDF	0.0015	J	0.0049	0.00013	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,6,7,8-HxCDD	0.0038	J	0.0049	0.00013	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,6,7,8-HxCDF	0.00062	J q	0.0049	0.00012	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,7,8,9-HxCDD	0.0022	J	0.0049	0.00011	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,7,8,9-HxCDF	0.00075	J B	0.0049	0.00011	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,7,8-PeCDD	0.00032	J q	0.0049	0.00016	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
1,2,3,7,8-PeCDF	0.00032	J q	0.0049	0.00013	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
2,3,4,6,7,8-HxCDF	0.00045	J	0.0049	0.00011	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
2,3,4,7,8-PeCDF	0.00037	J q	0.0049	0.00014	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
2,3,7,8-TCDD	0.00029	J	0.00099	0.00013	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
OCDD	0.44	B	0.0099	0.0019	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1
OCDF	0.036		0.0099	0.00034	ug/Kg	☆	06/21/18 15:50	06/27/18 18:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	45		23 - 140	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,4,6,7,8-HpCDF	41		28 - 143	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,4,7,8,9-HpCDF	45		26 - 138	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,4,7,8-HxCDD	56		32 - 141	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,4,7,8-HxCDF	57		26 - 152	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,6,7,8-HxCDD	57		28 - 130	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,6,7,8-HxCDF	57		26 - 123	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,7,8,9-HxCDF	57		29 - 147	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,7,8-PeCDD	72		25 - 181	06/21/18 15:50	06/27/18 18:40	1
13C-1,2,3,7,8-PeCDF	60		24 - 185	06/21/18 15:50	06/27/18 18:40	1
13C-2,3,4,6,7,8-HxCDF	55		28 - 136	06/21/18 15:50	06/27/18 18:40	1
13C-2,3,4,7,8-PeCDF	60		21 - 178	06/21/18 15:50	06/27/18 18:40	1
13C-2,3,7,8-TCDD	59		25 - 164	06/21/18 15:50	06/27/18 18:40	1
13C-OCDD	45		17 - 157	06/21/18 15:50	06/27/18 18:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	106		35 - 197	06/21/18 15:50	06/27/18 18:40	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00071	J q	0.00099	0.000099	ug/Kg	☆	06/21/18 15:50	06/28/18 04:07	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	59		24 - 169	06/21/18 15:50	06/28/18 04:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	109		35 - 197	06/21/18 15:50	06/28/18 04:07	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B297-BL1

Lab Sample ID: 580-78153-2

Date Collected: 06/15/18 15:33

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 50.7

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.048	B	0.0049	0.0012	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,4,6,7,8-HpCDF	0.010	q B	0.0049	0.00039	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,4,7,8,9-HpCDF	0.00087	J	0.0049	0.00043	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,4,7,8-HxCDD	ND		0.0049	0.00019	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,4,7,8-HxCDF	0.0016	J	0.0049	0.00016	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,6,7,8-HxCDD	0.0028	J	0.0049	0.00018	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,6,7,8-HxCDF	0.00072	J q	0.0049	0.00013	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,7,8,9-HxCDD	0.0022	J	0.0049	0.00016	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,7,8,9-HxCDF	0.00060	J	0.0049	0.00010	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,7,8-PeCDD	0.00073	J	0.0049	0.00019	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
1,2,3,7,8-PeCDF	0.00027	J q	0.0049	0.00015	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
2,3,4,6,7,8-HxCDF	0.00055	J q	0.0049	0.00011	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
2,3,4,7,8-PeCDF	0.00063	J	0.0049	0.00016	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
2,3,7,8-TCDD	ND		0.00097	0.00010	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
2,3,7,8-TCDF	0.00061	J q	0.00097	0.00014	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
OCDD	0.37	B	0.0097	0.0016	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1
OCDF	0.033		0.0097	0.00024	ug/Kg	☆	06/22/18 15:08	07/05/18 23:23	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	54		23 - 140	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,4,6,7,8-HpCDF	49		28 - 143	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,4,7,8,9-HpCDF	54		26 - 138	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,4,7,8-HxCDD	46		32 - 141	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,4,7,8-HxCDF	62		26 - 152	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,6,7,8-HxCDD	50		28 - 130	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,6,7,8-HxCDF	65		26 - 123	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,7,8,9-HxCDF	68		29 - 147	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,7,8-PeCDD	45		25 - 181	06/22/18 15:08	07/05/18 23:23	1
13C-1,2,3,7,8-PeCDF	46		24 - 185	06/22/18 15:08	07/05/18 23:23	1
13C-2,3,4,6,7,8-HxCDF	69		28 - 136	06/22/18 15:08	07/05/18 23:23	1
13C-2,3,4,7,8-PeCDF	47		21 - 178	06/22/18 15:08	07/05/18 23:23	1
13C-2,3,7,8-TCDD	56		25 - 164	06/22/18 15:08	07/05/18 23:23	1
13C-2,3,7,8-TCDF	58		24 - 169	06/22/18 15:08	07/05/18 23:23	1
13C-OCDD	50		17 - 157	06/22/18 15:08	07/05/18 23:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	91		35 - 197	06/22/18 15:08	07/05/18 23:23	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B293-BL1

Lab Sample ID: 580-78153-3

Date Collected: 06/15/18 14:50

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 44.6

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.048	B	0.0056	0.00091	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,4,6,7,8-HpCDF	0.0069	q B	0.0056	0.00019	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,4,7,8,9-HpCDF	0.00042	J q B	0.0056	0.00019	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,4,7,8-HxCDD	0.00078	J B	0.0056	0.000081	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,4,7,8-HxCDF	0.00069	J	0.0056	0.00011	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,6,7,8-HxCDD	0.0020	J	0.0056	0.000080	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,6,7,8-HxCDF	0.00055	J	0.0056	0.000091	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,7,8,9-HxCDD	0.0016	J	0.0056	0.000075	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,7,8,9-HxCDF	0.00021	J B	0.0056	0.000050	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,7,8-PeCDD	0.00038	J q	0.0056	0.00010	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
1,2,3,7,8-PeCDF	0.00030	J B	0.0056	0.000064	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
2,3,4,6,7,8-HxCDF	0.00035	J	0.0056	0.000058	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
2,3,4,7,8-PeCDF	0.00027	J	0.0056	0.000066	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
2,3,7,8-TCDD	0.00026	J q	0.0011	0.00010	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
2,3,7,8-TCDF	0.00042	J q	0.0011	0.000036	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
OCDD	0.40	B	0.011	0.00031	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1
OCDF	0.023	B	0.011	0.000083	ug/Kg	✱	07/03/18 11:49	07/10/18 16:20	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	32		23 - 140	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,4,6,7,8-HpCDF	29		28 - 143	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,4,7,8,9-HpCDF	37		26 - 138	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,4,7,8-HxCDD	39		32 - 141	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,4,7,8-HxCDF	35		26 - 152	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,6,7,8-HxCDD	39		28 - 130	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,6,7,8-HxCDF	35		26 - 123	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,7,8,9-HxCDF	42		29 - 147	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,7,8-PeCDD	50		25 - 181	07/03/18 11:49	07/10/18 16:20	1
13C-1,2,3,7,8-PeCDF	57		24 - 185	07/03/18 11:49	07/10/18 16:20	1
13C-2,3,4,6,7,8-HxCDF	39		28 - 136	07/03/18 11:49	07/10/18 16:20	1
13C-2,3,4,7,8-PeCDF	58		21 - 178	07/03/18 11:49	07/10/18 16:20	1
13C-2,3,7,8-TCDD	51		25 - 164	07/03/18 11:49	07/10/18 16:20	1
13C-2,3,7,8-TCDF	62		24 - 169	07/03/18 11:49	07/10/18 16:20	1
13C-OCDD	29		17 - 157	07/03/18 11:49	07/10/18 16:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	112		35 - 197	07/03/18 11:49	07/10/18 16:20	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B310-BL1

Lab Sample ID: 580-78153-4

Date Collected: 06/15/18 13:26

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 39.5

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.19	B	0.0063	0.0063	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,4,6,7,8-HpCDF	0.021	q B	0.0063	0.00068	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,4,7,8,9-HpCDF	0.0014	J	0.0063	0.00066	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,4,7,8-HxCDD	0.0021	J B	0.0063	0.00030	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,4,7,8-HxCDF	0.0031	J	0.0063	0.00022	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,6,7,8-HxCDD	0.0056	J	0.0063	0.00031	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,6,7,8-HxCDF	0.0016	J	0.0063	0.00019	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,7,8,9-HxCDD	0.0044	J	0.0063	0.00026	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,7,8,9-HxCDF	0.00028	J q	0.0063	0.00016	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,7,8-PeCDD	0.00091	J	0.0063	0.00027	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
1,2,3,7,8-PeCDF	0.00084	J	0.0063	0.00025	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
2,3,4,6,7,8-HxCDF	0.0011	J	0.0063	0.00016	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
2,3,4,7,8-PeCDF	0.0011	J	0.0063	0.00026	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
2,3,7,8-TCDD	ND		0.0013	0.00016	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
OCDD	1.4	B	0.013	0.0061	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1
OCDF	0.068		0.013	0.00041	ug/Kg	☼	06/22/18 15:08	07/06/18 00:06	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	51		23 - 140	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,4,6,7,8-HpCDF	46		28 - 143	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,4,7,8,9-HpCDF	55		26 - 138	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,4,7,8-HxCDD	52		32 - 141	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,4,7,8-HxCDF	64		26 - 152	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,6,7,8-HxCDD	54		28 - 130	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,6,7,8-HxCDF	69		26 - 123	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,7,8,9-HxCDF	67		29 - 147	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,7,8-PeCDD	44		25 - 181	06/22/18 15:08	07/06/18 00:06	1
13C-1,2,3,7,8-PeCDF	47		24 - 185	06/22/18 15:08	07/06/18 00:06	1
13C-2,3,4,6,7,8-HxCDF	68		28 - 136	06/22/18 15:08	07/06/18 00:06	1
13C-2,3,4,7,8-PeCDF	48		21 - 178	06/22/18 15:08	07/06/18 00:06	1
13C-2,3,7,8-TCDD	55		25 - 164	06/22/18 15:08	07/06/18 00:06	1
13C-OCDD	52		17 - 157	06/22/18 15:08	07/06/18 00:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	90		35 - 197	06/22/18 15:08	07/06/18 00:06	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00058	J	0.0013	0.000082	ug/Kg	☼	06/22/18 15:08	07/06/18 20:53	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	52		24 - 169	06/22/18 15:08	07/06/18 20:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	97		35 - 197	06/22/18 15:08	07/06/18 20:53	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B309-BL1

Lab Sample ID: 580-78153-5

Date Collected: 06/15/18 12:25

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 40.7

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.17		0.0061	0.0052	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,4,6,7,8-HpCDF	0.019	q	0.0061	0.00042	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,4,7,8,9-HpCDF	0.0022	J B	0.0061	0.00049	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,4,7,8-HxCDD	0.0016	J	0.0061	0.00024	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,4,7,8-HxCDF	0.0024	J	0.0061	0.00031	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,6,7,8-HxCDD	0.0042	J	0.0061	0.00022	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,6,7,8-HxCDF	0.0011	J q	0.0061	0.00030	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,7,8,9-HxCDD	0.0035	J	0.0061	0.00021	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,7,8,9-HxCDF	0.00075	J B	0.0061	0.00018	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,7,8-PeCDD	0.00080	J	0.0061	0.00013	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
1,2,3,7,8-PeCDF	0.00044	J q	0.0061	0.00016	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
2,3,4,6,7,8-HxCDF	0.00094	J	0.0061	0.00023	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
2,3,4,7,8-PeCDF	0.00065	J q	0.0061	0.00018	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
2,3,7,8-TCDD	0.00032	J q	0.0012	0.00010	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
2,3,7,8-TCDF	0.0011	J	0.0012	0.00011	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
OCDD	1.4	B	0.012	0.0015	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1
OCDF	0.065		0.012	0.00016	ug/Kg	☆	06/21/18 15:50	06/28/18 03:25	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	42		23 - 140	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,4,6,7,8-HpCDF	48		28 - 143	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,4,7,8,9-HpCDF	52		26 - 138	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,4,7,8-HxCDD	56		32 - 141	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,4,7,8-HxCDF	55		26 - 152	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,6,7,8-HxCDD	58		28 - 130	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,6,7,8-HxCDF	57		26 - 123	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,7,8,9-HxCDF	60		29 - 147	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,7,8-PeCDD	59		25 - 181	06/21/18 15:50	06/28/18 03:25	1
13C-1,2,3,7,8-PeCDF	71		24 - 185	06/21/18 15:50	06/28/18 03:25	1
13C-2,3,4,6,7,8-HxCDF	55		28 - 136	06/21/18 15:50	06/28/18 03:25	1
13C-2,3,4,7,8-PeCDF	72		21 - 178	06/21/18 15:50	06/28/18 03:25	1
13C-2,3,7,8-TCDD	66		25 - 164	06/21/18 15:50	06/28/18 03:25	1
13C-2,3,7,8-TCDF	78		24 - 169	06/21/18 15:50	06/28/18 03:25	1
13C-OCDD	36		17 - 157	06/21/18 15:50	06/28/18 03:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	128		35 - 197	06/21/18 15:50	06/28/18 03:25	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B314-BL1

Lab Sample ID: 580-78153-6

Date Collected: 06/16/18 14:16

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 68.8

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.011		0.0037	0.00028	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,4,6,7,8-HpCDF	0.0027	J	0.0037	0.000063	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,4,7,8,9-HpCDF	0.0016	J B	0.0037	0.000072	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,4,7,8-HxCDD	0.00053	J q	0.0037	0.000065	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,4,7,8-HxCDF	0.00040	J q	0.0037	0.000090	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,6,7,8-HxCDD	0.00076	J q	0.0037	0.000059	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,6,7,8-HxCDF	0.00041	J	0.0037	0.000094	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,7,8,9-HxCDD	0.00088	J	0.0037	0.000058	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,7,8,9-HxCDF	0.00082	J B	0.0037	0.000056	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,7,8-PeCDD	0.00023	J	0.0037	0.000066	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
1,2,3,7,8-PeCDF	0.00013	J	0.0037	0.000042	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
2,3,4,6,7,8-HxCDF	0.00048	J	0.0037	0.000073	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
2,3,4,7,8-PeCDF	0.00015	J	0.0037	0.000045	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
2,3,7,8-TCDD	0.00010	J q	0.00073	0.000048	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
2,3,7,8-TCDF	0.00017	J q	0.00073	0.000033	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
OCDD	0.079	B	0.0073	0.000090	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1
OCDF	0.0089		0.0073	0.000062	ug/Kg	☆	06/21/18 15:50	06/28/18 04:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	43		23 - 140	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,4,6,7,8-HpCDF	51		28 - 143	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,4,7,8,9-HpCDF	52		26 - 138	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,4,7,8-HxCDD	54		32 - 141	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,4,7,8-HxCDF	54		26 - 152	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,6,7,8-HxCDD	57		28 - 130	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,6,7,8-HxCDF	55		26 - 123	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,7,8,9-HxCDF	58		29 - 147	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,7,8-PeCDD	55		25 - 181	06/21/18 15:50	06/28/18 04:11	1
13C-1,2,3,7,8-PeCDF	66		24 - 185	06/21/18 15:50	06/28/18 04:11	1
13C-2,3,4,6,7,8-HxCDF	54		28 - 136	06/21/18 15:50	06/28/18 04:11	1
13C-2,3,4,7,8-PeCDF	66		21 - 178	06/21/18 15:50	06/28/18 04:11	1
13C-2,3,7,8-TCDD	61		25 - 164	06/21/18 15:50	06/28/18 04:11	1
13C-2,3,7,8-TCDF	70		24 - 169	06/21/18 15:50	06/28/18 04:11	1
13C-OCDD	35		17 - 157	06/21/18 15:50	06/28/18 04:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	125		35 - 197	06/21/18 15:50	06/28/18 04:11	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B030-BL1

Lab Sample ID: 580-78153-7

Date Collected: 06/17/18 12:11

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 37.9

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.13		0.0066	0.0035	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,4,6,7,8-HpCDF	0.014	q	0.0066	0.00032	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,4,7,8,9-HpCDF	0.0012	J B	0.0066	0.00037	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,4,7,8-HxCDD	0.00084	J	0.0066	0.00017	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,4,7,8-HxCDF	0.0019	J	0.0066	0.00023	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,6,7,8-HxCDD	0.0032	J	0.0066	0.00015	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,6,7,8-HxCDF	0.00077	J q	0.0066	0.00023	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,7,8,9-HxCDD	0.0024	J	0.0066	0.00015	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,7,8,9-HxCDF	0.00040	J B	0.0066	0.00013	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,7,8-PeCDD	0.00053	J q	0.0066	0.00013	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
1,2,3,7,8-PeCDF	0.00073	J	0.0066	0.000085	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
2,3,4,6,7,8-HxCDF	0.00032	J q	0.0066	0.00018	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
2,3,4,7,8-PeCDF	0.00052	J	0.0066	0.000092	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
2,3,7,8-TCDD	0.00026	J q	0.0013	0.00010	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
2,3,7,8-TCDF	0.0011	J	0.0013	0.000077	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
OCDD	1.1	B	0.013	0.0013	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1
OCDF	0.071		0.013	0.00010	ug/Kg	☆	06/21/18 15:50	06/28/18 04:57	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	46		23 - 140	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,4,6,7,8-HpCDF	54		28 - 143	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,4,7,8,9-HpCDF	56		26 - 138	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,4,7,8-HxCDD	58		32 - 141	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,4,7,8-HxCDF	57		26 - 152	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,6,7,8-HxCDD	61		28 - 130	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,6,7,8-HxCDF	58		26 - 123	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,7,8,9-HxCDF	63		29 - 147	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,7,8-PeCDD	60		25 - 181	06/21/18 15:50	06/28/18 04:57	1
13C-1,2,3,7,8-PeCDF	72		24 - 185	06/21/18 15:50	06/28/18 04:57	1
13C-2,3,4,6,7,8-HxCDF	58		28 - 136	06/21/18 15:50	06/28/18 04:57	1
13C-2,3,4,7,8-PeCDF	72		21 - 178	06/21/18 15:50	06/28/18 04:57	1
13C-2,3,7,8-TCDD	65		25 - 164	06/21/18 15:50	06/28/18 04:57	1
13C-2,3,7,8-TCDF	77		24 - 169	06/21/18 15:50	06/28/18 04:57	1
13C-OCDD	40		17 - 157	06/21/18 15:50	06/28/18 04:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	130		35 - 197	06/21/18 15:50	06/28/18 04:57	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B031-BL1

Lab Sample ID: 580-78153-8

Date Collected: 06/17/18 11:20

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 37.8

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.25		0.0065	0.0061	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,4,6,7,8-HpCDF	0.014	q	0.0065	0.00033	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,4,7,8,9-HpCDF	0.0011	J B	0.0065	0.00039	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,4,7,8-HxCDD	0.0011	J	0.0065	0.00024	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,4,7,8-HxCDF	0.0022	J	0.0065	0.00024	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,6,7,8-HxCDD	0.0048	J	0.0065	0.00023	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,6,7,8-HxCDF	0.00068	J q	0.0065	0.00024	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,7,8,9-HxCDD	0.0036	J	0.0065	0.00022	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,7,8,9-HxCDF	0.00039	J B	0.0065	0.00015	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,7,8-PeCDD	0.00057	J	0.0065	0.00012	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
1,2,3,7,8-PeCDF	0.00080	J	0.0065	0.000093	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
2,3,4,6,7,8-HxCDF	0.00042	J	0.0065	0.00018	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
2,3,4,7,8-PeCDF	0.00059	J	0.0065	0.000098	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
2,3,7,8-TCDD	0.00021	J q	0.0013	0.000091	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
2,3,7,8-TCDF	0.0011	J	0.0013	0.000094	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
OCDD	1.7	B	0.013	0.0014	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1
OCDF	0.052		0.013	0.000098	ug/Kg	☆	06/21/18 15:50	06/28/18 05:43	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	46		23 - 140	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,4,6,7,8-HpCDF	54		28 - 143	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,4,7,8,9-HpCDF	56		26 - 138	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,4,7,8-HxCDD	57		32 - 141	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,4,7,8-HxCDF	56		26 - 152	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,6,7,8-HxCDD	59		28 - 130	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,6,7,8-HxCDF	57		26 - 123	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,7,8,9-HxCDF	61		29 - 147	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,7,8-PeCDD	60		25 - 181	06/21/18 15:50	06/28/18 05:43	1
13C-1,2,3,7,8-PeCDF	72		24 - 185	06/21/18 15:50	06/28/18 05:43	1
13C-2,3,4,6,7,8-HxCDF	57		28 - 136	06/21/18 15:50	06/28/18 05:43	1
13C-2,3,4,7,8-PeCDF	72		21 - 178	06/21/18 15:50	06/28/18 05:43	1
13C-2,3,7,8-TCDD	66		25 - 164	06/21/18 15:50	06/28/18 05:43	1
13C-2,3,7,8-TCDF	78		24 - 169	06/21/18 15:50	06/28/18 05:43	1
13C-OCDD	40		17 - 157	06/21/18 15:50	06/28/18 05:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	128		35 - 197	06/21/18 15:50	06/28/18 05:43	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B042-BL1

Lab Sample ID: 580-78153-9

Date Collected: 06/17/18 14:46

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 63.9

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.14	B	0.0040	0.0037	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,4,6,7,8-HpCDF	0.050	B	0.0040	0.00084	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,4,7,8,9-HpCDF	0.0032	J	0.0040	0.0011	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,4,7,8-HxCDD	0.00042	J q B	0.0040	0.00020	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,4,7,8-HxCDF	0.0063		0.0040	0.00025	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,6,7,8-HxCDD	0.0049		0.0040	0.00019	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,6,7,8-HxCDF	0.0062		0.0040	0.00025	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,7,8,9-HxCDD	0.0021	J	0.0040	0.00016	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,7,8,9-HxCDF	ND		0.0040	0.00020	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,7,8-PeCDD	ND		0.0040	0.00017	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
1,2,3,7,8-PeCDF	0.0025	J	0.0040	0.00014	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
2,3,4,6,7,8-HxCDF	0.00099	J	0.0040	0.00023	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
2,3,4,7,8-PeCDF	0.0012	J q	0.0040	0.00015	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
2,3,7,8-TCDD	ND		0.00079	0.00010	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
OCDD	1.6	B	0.0079	0.0062	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
OCDF	0.14		0.0079	0.00053	ug/Kg	☼	06/22/18 15:08	07/06/18 00:49	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	56		23 - 140				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,4,6,7,8-HpCDF	60		28 - 143				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,4,7,8,9-HpCDF	59		26 - 138				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,4,7,8-HxCDD	64		32 - 141				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,4,7,8-HxCDF	80		26 - 152				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,6,7,8-HxCDD	63		28 - 130				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,6,7,8-HxCDF	79		26 - 123				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,7,8,9-HxCDF	82		29 - 147				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,7,8-PeCDD	53		25 - 181				06/22/18 15:08	07/06/18 00:49	1
13C-1,2,3,7,8-PeCDF	55		24 - 185				06/22/18 15:08	07/06/18 00:49	1
13C-2,3,4,6,7,8-HxCDF	74		28 - 136				06/22/18 15:08	07/06/18 00:49	1
13C-2,3,4,7,8-PeCDF	52		21 - 178				06/22/18 15:08	07/06/18 00:49	1
13C-2,3,7,8-TCDD	57		25 - 164				06/22/18 15:08	07/06/18 00:49	1
13C-OCDD	60		17 - 157				06/22/18 15:08	07/06/18 00:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	93		35 - 197				06/22/18 15:08	07/06/18 00:49	1

Method: 1613B - Dioxins and Furans (HRGC/HRMS) - RA

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.00065	J	0.00079	0.000068	ug/Kg	☼	06/22/18 15:08	07/06/18 21:33	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	58		24 - 169				06/22/18 15:08	07/06/18 21:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	102		35 - 197				06/22/18 15:08	07/06/18 21:33	1

TestAmerica Seattle

Client Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-RB-VV-20160616

Lab Sample ID: 580-78153-10

Date Collected: 06/16/18 16:30

Matrix: Water

Date Received: 06/18/18 12:40

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	2.9	J B	51	0.091	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,4,6,7,8-HpCDF	1.8	J B q	51	0.21	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,4,7,8,9-HpCDF	5.8	J B	51	0.27	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,4,7,8-HxCDD	1.6	J B q	51	0.14	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,4,7,8-HxCDF	1.0	J B	51	0.22	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,6,7,8-HxCDD	0.84	J B	51	0.13	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,6,7,8-HxCDF	0.86	J B	51	0.21	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,7,8,9-HxCDD	0.94	J B	51	0.12	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,7,8,9-HxCDF	5.7	J B q	51	0.14	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,7,8-PeCDD	0.53	J B	51	0.19	pg/L		06/20/18 08:13	06/27/18 04:40	1
1,2,3,7,8-PeCDF	1.6	J B	51	0.19	pg/L		06/20/18 08:13	06/27/18 04:40	1
2,3,4,6,7,8-HxCDF	0.49	J B q	51	0.16	pg/L		06/20/18 08:13	06/27/18 04:40	1
2,3,4,7,8-PeCDF	0.76	J B	51	0.23	pg/L		06/20/18 08:13	06/27/18 04:40	1
2,3,7,8-TCDD	ND		10	0.18	pg/L		06/20/18 08:13	06/27/18 04:40	1
2,3,7,8-TCDF	1.1	J B q	10	0.12	pg/L		06/20/18 08:13	06/27/18 04:40	1
OCDD	12	J B	100	0.11	pg/L		06/20/18 08:13	06/27/18 04:40	1
OCDF	3.2	J B	100	0.10	pg/L		06/20/18 08:13	06/27/18 04:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	77		23 - 140	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,4,6,7,8-HpCDF	77		28 - 143	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,4,7,8,9-HpCDF	81		26 - 138	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,4,7,8-HxCDD	67		32 - 141	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,4,7,8-HxCDF	74		26 - 152	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,6,7,8-HxCDD	61		28 - 130	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,6,7,8-HxCDF	64		26 - 123	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,7,8,9-HxCDF	75		29 - 147	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,7,8-PeCDD	72		25 - 181	06/20/18 08:13	06/27/18 04:40	1
13C-1,2,3,7,8-PeCDF	72		24 - 185	06/20/18 08:13	06/27/18 04:40	1
13C-2,3,4,6,7,8-HxCDF	70		28 - 136	06/20/18 08:13	06/27/18 04:40	1
13C-2,3,4,7,8-PeCDF	70		21 - 178	06/20/18 08:13	06/27/18 04:40	1
13C-2,3,7,8-TCDD	74		25 - 164	06/20/18 08:13	06/27/18 04:40	1
13C-2,3,7,8-TCDF	83		24 - 169	06/20/18 08:13	06/27/18 04:40	1
13C-OCDD	80		17 - 157	06/20/18 08:13	06/27/18 04:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	113		35 - 197	06/20/18 08:13	06/27/18 04:40	1

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 320-229950/1-A

Matrix: Water

Analysis Batch: 230945

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 229950

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	16.1	J	50	0.39	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,4,6,7,8-HpCDF	57.1		50	0.49	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,4,7,8,9-HpCDF	9.02	J	50	0.61	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,4,7,8-HxCDD	3.13	J	50	0.21	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,4,7,8-HxCDF	12.0	J	50	0.54	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,6,7,8-HxCDD	2.13	J q	50	0.20	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,6,7,8-HxCDF	3.43	J	50	0.50	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,7,8,9-HxCDD	1.94	J q	50	0.19	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,7,8,9-HxCDF	7.17	J	50	0.34	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,7,8-PeCDD	1.89	J	50	0.27	pg/L		06/20/18 08:13	06/26/18 12:48	1
1,2,3,7,8-PeCDF	2.33	J q	50	0.26	pg/L		06/20/18 08:13	06/26/18 12:48	1
2,3,4,6,7,8-HxCDF	1.98	J	50	0.36	pg/L		06/20/18 08:13	06/26/18 12:48	1
2,3,4,7,8-PeCDF	1.78	J	50	0.28	pg/L		06/20/18 08:13	06/26/18 12:48	1
2,3,7,8-TCDD	0.731	J q	10	0.25	pg/L		06/20/18 08:13	06/26/18 12:48	1
2,3,7,8-TCDF	1.06	J q	10	0.15	pg/L		06/20/18 08:13	06/26/18 12:48	1
OCDD	175		100	0.41	pg/L		06/20/18 08:13	06/26/18 12:48	1
OCDF	96.9	J	100	0.38	pg/L		06/20/18 08:13	06/26/18 12:48	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	61		23 - 140	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,4,6,7,8-HpCDF	61		28 - 143	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,4,7,8,9-HpCDF	63		26 - 138	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,4,7,8-HxCDD	61		32 - 141	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,4,7,8-HxCDF	63		26 - 152	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,6,7,8-HxCDD	54		28 - 130	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,6,7,8-HxCDF	58		26 - 123	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,7,8,9-HxCDF	67		29 - 147	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,7,8-PeCDD	70		25 - 181	06/20/18 08:13	06/26/18 12:48	1
13C-1,2,3,7,8-PeCDF	68		24 - 185	06/20/18 08:13	06/26/18 12:48	1
13C-2,3,4,6,7,8-HxCDF	65		28 - 136	06/20/18 08:13	06/26/18 12:48	1
13C-2,3,4,7,8-PeCDF	71		21 - 178	06/20/18 08:13	06/26/18 12:48	1
13C-2,3,7,8-TCDD	67		25 - 164	06/20/18 08:13	06/26/18 12:48	1
13C-2,3,7,8-TCDF	79		24 - 169	06/20/18 08:13	06/26/18 12:48	1
13C-OCDD	58		17 - 157	06/20/18 08:13	06/26/18 12:48	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	120		35 - 197	06/20/18 08:13	06/26/18 12:48	1

Lab Sample ID: LCS 320-229950/2-A

Matrix: Water

Analysis Batch: 230945

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 229950

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	1000	1050		pg/L		105	70 - 140
1,2,3,4,6,7,8-HpCDF	1000	1040		pg/L		104	82 - 122
1,2,3,4,7,8,9-HpCDF	1000	1010		pg/L		101	78 - 138
1,2,3,4,7,8-HxCDD	1000	1010		pg/L		101	70 - 164
1,2,3,4,7,8-HxCDF	1000	1040		pg/L		104	72 - 134

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-229950/2-A

Matrix: Water

Analysis Batch: 230945

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 229950

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	1000	1050		pg/L		105	76 - 134
1,2,3,6,7,8-HxCDF	1000	1030		pg/L		103	84 - 130
1,2,3,7,8,9-HxCDD	1000	1180		pg/L		118	64 - 162
1,2,3,7,8,9-HxCDF	1000	1040		pg/L		104	78 - 130
1,2,3,7,8-PeCDD	1000	1050		pg/L		105	70 - 142
1,2,3,7,8-PeCDF	1000	1040		pg/L		104	80 - 134
2,3,4,6,7,8-HxCDF	1000	1030		pg/L		103	70 - 156
2,3,4,7,8-PeCDF	1000	1060		pg/L		106	68 - 160
2,3,7,8-TCDD	200	213		pg/L		106	67 - 158
2,3,7,8-TCDF	200	199		pg/L		100	75 - 158
OCDD	2000	2000		pg/L		100	78 - 144
OCDF	2000	1950		pg/L		97	63 - 170

LCS LCS			
Isotope Dilution	%Recovery	Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	71		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	69		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	72		20 - 186
13C-1,2,3,4,7,8-HxCDD	66		21 - 193
13C-1,2,3,4,7,8-HxCDF	66		19 - 202
13C-1,2,3,6,7,8-HxCDD	56		25 - 163
13C-1,2,3,6,7,8-HxCDF	60		21 - 159
13C-1,2,3,7,8,9-HxCDF	68		17 - 205
13C-1,2,3,7,8-PeCDD	71		21 - 227
13C-1,2,3,7,8-PeCDF	71		21 - 192
13C-2,3,4,6,7,8-HxCDF	67		22 - 176
13C-2,3,4,7,8-PeCDF	71		13 - 328
13C-2,3,7,8-TCDD	69		20 - 175
13C-2,3,7,8-TCDF	80		22 - 152
13C-OCDD	70		13 - 199

LCS LCS			
Surrogate	%Recovery	Qualifier	Limits
37Cl/4-2,3,7,8-TCDD	119		31 - 191

Lab Sample ID: LCSD 320-229950/3-A

Matrix: Water

Analysis Batch: 230945

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 229950

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD	1000	1060		pg/L		106	70 - 140	1	50
1,2,3,4,6,7,8-HpCDF	1000	1070		pg/L		107	82 - 122	3	50
1,2,3,4,7,8,9-HpCDF	1000	1040		pg/L		104	78 - 138	3	50
1,2,3,4,7,8-HxCDD	1000	1060		pg/L		106	70 - 164	5	50
1,2,3,4,7,8-HxCDF	1000	1060		pg/L		106	72 - 134	2	50
1,2,3,6,7,8-HxCDD	1000	1060		pg/L		106	76 - 134	1	50
1,2,3,6,7,8-HxCDF	1000	1060		pg/L		106	84 - 130	3	50
1,2,3,7,8,9-HxCDD	1000	1240		pg/L		124	64 - 162	5	50
1,2,3,7,8,9-HxCDF	1000	1060		pg/L		106	78 - 130	2	50
1,2,3,7,8-PeCDD	1000	1090		pg/L		109	70 - 142	4	50

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-229950/3-A

Matrix: Water

Analysis Batch: 230945

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 229950

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	1000	1070		pg/L		107	80 - 134	3	50
2,3,4,6,7,8-HxCDF	1000	1040		pg/L		104	70 - 156	2	50
2,3,4,7,8-PeCDF	1000	1080		pg/L		108	68 - 160	2	50
2,3,7,8-TCDD	200	221		pg/L		111	67 - 158	4	50
2,3,7,8-TCDF	200	204		pg/L		102	75 - 158	3	50
OCDD	2000	2030		pg/L		102	78 - 144	2	50
OCDF	2000	1970		pg/L		98	63 - 170	1	50

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	56		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	55		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	58		20 - 186
13C-1,2,3,4,7,8-HxCDD	50		21 - 193
13C-1,2,3,4,7,8-HxCDF	53		19 - 202
13C-1,2,3,6,7,8-HxCDD	45		25 - 163
13C-1,2,3,6,7,8-HxCDF	46		21 - 159
13C-1,2,3,7,8,9-HxCDF	53		17 - 205
13C-1,2,3,7,8-PeCDD	54		21 - 227
13C-1,2,3,7,8-PeCDF	56		21 - 192
13C-2,3,4,6,7,8-HxCDF	50		22 - 176
13C-2,3,4,7,8-PeCDF	57		13 - 328
13C-2,3,7,8-TCDD	61		20 - 175
13C-2,3,7,8-TCDF	73		22 - 152
13C-OCDD	58		13 - 199

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	117		31 - 191

Lab Sample ID: MB 320-230306/1-A

Matrix: Solid

Analysis Batch: 231207

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 230306

Analyte	MB		RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,2,3,4,6,7,8-HpCDD	ND		0.0050	0.000085	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,4,6,7,8-HpCDF	ND		0.0050	0.00010	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,4,7,8,9-HpCDF	0.000314	J q	0.0050	0.00014	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,4,7,8-HxCDD	ND		0.0050	0.00012	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000089	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.00011	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000085	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.00010	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,7,8,9-HxCDF	0.000241	J q	0.0050	0.000081	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,7,8-PeCDD	ND		0.0050	0.00013	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
1,2,3,7,8-PeCDF	ND		0.0050	0.00012	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000081	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
2,3,4,7,8-PeCDF	ND		0.0050	0.00013	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
2,3,7,8-TCDD	ND		0.0010	0.00014	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
2,3,7,8-TCDF	ND		0.0010	0.00011	ug/Kg		06/21/18 15:50	06/27/18 02:53	1

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 320-230306/1-A

Matrix: Solid

Analysis Batch: 231207

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 230306

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
OCDD	0.000423	J	0.010	0.00014	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
OCDF	ND		0.010	0.00021	ug/Kg		06/21/18 15:50	06/27/18 02:53	1
Isotope Dilution	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	63		23 - 140				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,4,6,7,8-HpCDF	64		28 - 143				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,4,7,8,9-HpCDF	59		26 - 138				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,4,7,8-HxCDD	63		32 - 141				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,4,7,8-HxCDF	68		26 - 152				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,6,7,8-HxCDD	77		28 - 130				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,6,7,8-HxCDF	68		26 - 123				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,7,8,9-HxCDF	64		29 - 147				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,7,8-PeCDD	84		25 - 181				06/21/18 15:50	06/27/18 02:53	1
13C-1,2,3,7,8-PeCDF	67		24 - 185				06/21/18 15:50	06/27/18 02:53	1
13C-2,3,4,6,7,8-HxCDF	66		28 - 136				06/21/18 15:50	06/27/18 02:53	1
13C-2,3,4,7,8-PeCDF	65		21 - 178				06/21/18 15:50	06/27/18 02:53	1
13C-2,3,7,8-TCDD	66		25 - 164				06/21/18 15:50	06/27/18 02:53	1
13C-2,3,7,8-TCDF	65		24 - 169				06/21/18 15:50	06/27/18 02:53	1
13C-OCDD	61		17 - 157				06/21/18 15:50	06/27/18 02:53	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	103		35 - 197				06/21/18 15:50	06/27/18 02:53	1

Lab Sample ID: LCS 320-230306/2-A

Matrix: Solid

Analysis Batch: 231207

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 230306

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.0992		ug/Kg		99	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.107		ug/Kg		107	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.105		ug/Kg		105	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.0998		ug/Kg		100	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.102		ug/Kg		102	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.0929		ug/Kg		93	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.105		ug/Kg		105	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.0930		ug/Kg		93	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.101		ug/Kg		101	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0856		ug/Kg		86	70 - 142
1,2,3,7,8-PeCDF	0.100	0.102		ug/Kg		102	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.107		ug/Kg		107	70 - 156
2,3,4,7,8-PeCDF	0.100	0.104		ug/Kg		104	68 - 160
2,3,7,8-TCDD	0.0200	0.0220		ug/Kg		110	67 - 158
2,3,7,8-TCDF	0.0200	0.0215		ug/Kg		107	75 - 158
OCDD	0.200	0.176		ug/Kg		88	78 - 144
OCDF	0.200	0.171		ug/Kg		85	63 - 170
Isotope Dilution	%Recovery	LCS Qualifier	Limits				
13C-1,2,3,4,6,7,8-HpCDD	65		26 - 166				

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-230306/2-A

Matrix: Solid

Analysis Batch: 231207

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 230306

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDF	63		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	62		20 - 186
13C-1,2,3,4,7,8-HxCDD	68		21 - 193
13C-1,2,3,4,7,8-HxCDF	68		19 - 202
13C-1,2,3,6,7,8-HxCDD	76		25 - 163
13C-1,2,3,6,7,8-HxCDF	70		21 - 159
13C-1,2,3,7,8,9-HxCDF	68		17 - 205
13C-1,2,3,7,8-PeCDD	91		21 - 227
13C-1,2,3,7,8-PeCDF	72		21 - 192
13C-2,3,4,6,7,8-HxCDF	67		22 - 176
13C-2,3,4,7,8-PeCDF	70		13 - 328
13C-2,3,7,8-TCDD	70		20 - 175
13C-2,3,7,8-TCDF	70		22 - 152
13C-OCDD	64		13 - 199

Surrogate	LCS		Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	109		31 - 191

Lab Sample ID: LCSD 320-230306/3-A

Matrix: Solid

Analysis Batch: 231207

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 230306

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	
							RPD	Limit	RPD	Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.0974		ug/Kg		97	2	70 - 140	2	50
1,2,3,4,6,7,8-HpCDF	0.100	0.103		ug/Kg		103	3	82 - 122	3	50
1,2,3,4,7,8,9-HpCDF	0.100	0.103		ug/Kg		103	2	78 - 138	2	50
1,2,3,4,7,8-HxCDD	0.100	0.0947		ug/Kg		95	5	70 - 164	5	50
1,2,3,4,7,8-HxCDF	0.100	0.101		ug/Kg		101	2	72 - 134	2	50
1,2,3,6,7,8-HxCDD	0.100	0.0882		ug/Kg		88	5	76 - 134	5	50
1,2,3,6,7,8-HxCDF	0.100	0.100		ug/Kg		100	5	84 - 130	5	50
1,2,3,7,8,9-HxCDD	0.100	0.0904		ug/Kg		90	3	64 - 162	3	50
1,2,3,7,8,9-HxCDF	0.100	0.0989		ug/Kg		99	2	78 - 130	2	50
1,2,3,7,8-PeCDD	0.100	0.0848		ug/Kg		85	1	70 - 142	1	50
1,2,3,7,8-PeCDF	0.100	0.0975		ug/Kg		97	5	80 - 134	5	50
2,3,4,6,7,8-HxCDF	0.100	0.103		ug/Kg		103	4	70 - 156	4	50
2,3,4,7,8-PeCDF	0.100	0.103		ug/Kg		103	1	68 - 160	1	50
2,3,7,8-TCDD	0.0200	0.0214		ug/Kg		107	3	67 - 158	3	50
2,3,7,8-TCDF	0.0200	0.0218		ug/Kg		109	2	75 - 158	2	50
OCDD	0.200	0.177		ug/Kg		89	0	78 - 144	0	50
OCDF	0.200	0.168		ug/Kg		84	1	63 - 170	1	50

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	61		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	61		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	57		20 - 186
13C-1,2,3,4,7,8-HxCDD	67		21 - 193
13C-1,2,3,4,7,8-HxCDF	66		19 - 202
13C-1,2,3,6,7,8-HxCDD	71		25 - 163

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-230306/3-A

Matrix: Solid

Analysis Batch: 231207

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 230306

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,6,7,8-HxCDF	68		21 - 159
13C-1,2,3,7,8,9-HxCDF	64		17 - 205
13C-1,2,3,7,8-PeCDD	81		21 - 227
13C-1,2,3,7,8-PeCDF	67		21 - 192
13C-2,3,4,6,7,8-HxCDF	65		22 - 176
13C-2,3,4,7,8-PeCDF	65		13 - 328
13C-2,3,7,8-TCDD	65		20 - 175
13C-2,3,7,8-TCDF	64		22 - 152
13C-OCDD	58		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl4-2,3,7,8-TCDD	104		31 - 191

Lab Sample ID: MB 320-230501/1-A

Matrix: Solid

Analysis Batch: 232728

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 230501

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000173	J q	0.0050	0.000065	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,4,6,7,8-HpCDF	0.000125	J q	0.0050	0.000065	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,4,7,8,9-HpCDF	ND		0.0050	0.000086	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,4,7,8-HxCDD	0.000265	J q	0.0050	0.00012	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000057	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.00012	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000053	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.00010	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,7,8,9-HxCDF	ND		0.0050	0.000042	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,7,8-PeCDD	ND		0.0050	0.00013	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
1,2,3,7,8-PeCDF	ND		0.0050	0.000073	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000044	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000089	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
2,3,7,8-TCDD	ND		0.0010	0.000079	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
2,3,7,8-TCDF	ND		0.0010	0.00012	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
OCDD	0.000342	J	0.010	0.000074	ug/Kg		06/22/18 15:08	07/05/18 21:15	1
OCDF	ND		0.010	0.00012	ug/Kg		06/22/18 15:08	07/05/18 21:15	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	67		23 - 140	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,4,6,7,8-HpCDF	74		28 - 143	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,4,7,8,9-HpCDF	70		26 - 138	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,4,7,8-HxCDD	58		32 - 141	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,4,7,8-HxCDF	81		26 - 152	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,6,7,8-HxCDD	66		28 - 130	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,6,7,8-HxCDF	83		26 - 123	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,7,8,9-HxCDF	84		29 - 147	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,7,8-PeCDD	58		25 - 181	06/22/18 15:08	07/05/18 21:15	1
13C-1,2,3,7,8-PeCDF	62		24 - 185	06/22/18 15:08	07/05/18 21:15	1
13C-2,3,4,6,7,8-HxCDF	83		28 - 136	06/22/18 15:08	07/05/18 21:15	1

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 320-230501/1-A

Matrix: Solid

Analysis Batch: 232728

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 230501

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,4,7,8-PeCDF	57		21 - 178	06/22/18 15:08	07/05/18 21:15	1
13C-2,3,7,8-TCDD	65		25 - 164	06/22/18 15:08	07/05/18 21:15	1
13C-2,3,7,8-TCDF	67		24 - 169	06/22/18 15:08	07/05/18 21:15	1
13C-OCDD	66		17 - 157	06/22/18 15:08	07/05/18 21:15	1
Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	92		35 - 197	06/22/18 15:08	07/05/18 21:15	1

Lab Sample ID: LCS 320-230501/2-A

Matrix: Solid

Analysis Batch: 232728

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 230501

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.108		ug/Kg		108	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.110		ug/Kg		110	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.108		ug/Kg		108	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.120		ug/Kg		120	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.116		ug/Kg		116	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.112		ug/Kg		112	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.120		ug/Kg		120	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.119		ug/Kg		119	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.114		ug/Kg		114	78 - 130
1,2,3,7,8-PeCDD	0.100	0.103		ug/Kg		103	70 - 142
1,2,3,7,8-PeCDF	0.100	0.116		ug/Kg		116	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.116		ug/Kg		116	70 - 156
2,3,4,7,8-PeCDF	0.100	0.119		ug/Kg		119	68 - 160
2,3,7,8-TCDD	0.0200	0.0240		ug/Kg		120	67 - 158
2,3,7,8-TCDF	0.0200	0.0193		ug/Kg		97	75 - 158
OCDD	0.200	0.198		ug/Kg		99	78 - 144
OCDF	0.200	0.215		ug/Kg		107	63 - 170

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	63		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	67		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	63		20 - 186
13C-1,2,3,4,7,8-HxCDD	59		21 - 193
13C-1,2,3,4,7,8-HxCDF	76		19 - 202
13C-1,2,3,6,7,8-HxCDD	61		25 - 163
13C-1,2,3,6,7,8-HxCDF	76		21 - 159
13C-1,2,3,7,8,9-HxCDF	77		17 - 205
13C-1,2,3,7,8-PeCDD	53		21 - 227
13C-1,2,3,7,8-PeCDF	55		21 - 192
13C-2,3,4,6,7,8-HxCDF	76		22 - 176
13C-2,3,4,7,8-PeCDF	54		13 - 328
13C-2,3,7,8-TCDD	62		20 - 175
13C-2,3,7,8-TCDF	63		22 - 152
13C-OCDD	61		13 - 199

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-230501/2-A

Matrix: Solid

Analysis Batch: 232728

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 230501

Surrogate	LCS %Recovery	LCS Qualifier	Limits
37Cl/4-2,3,7,8-TCDD	93		31 - 191

Lab Sample ID: LCSD 320-230501/3-A

Matrix: Solid

Analysis Batch: 232728

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 230501

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.108		ug/Kg		108	70 - 140	0	50
1,2,3,4,6,7,8-HpCDF	0.100	0.105		ug/Kg		105	82 - 122	5	50
1,2,3,4,7,8,9-HpCDF	0.100	0.104		ug/Kg		104	78 - 138	3	50
1,2,3,4,7,8-HxCDD	0.100	0.116		ug/Kg		116	70 - 164	3	50
1,2,3,4,7,8-HxCDF	0.100	0.115		ug/Kg		115	72 - 134	1	50
1,2,3,6,7,8-HxCDD	0.100	0.108		ug/Kg		108	76 - 134	3	50
1,2,3,6,7,8-HxCDF	0.100	0.118		ug/Kg		118	84 - 130	2	50
1,2,3,7,8,9-HxCDD	0.100	0.104		ug/Kg		104	64 - 162	13	50
1,2,3,7,8,9-HxCDF	0.100	0.109		ug/Kg		109	78 - 130	5	50
1,2,3,7,8-PeCDD	0.100	0.104		ug/Kg		104	70 - 142	2	50
1,2,3,7,8-PeCDF	0.100	0.114		ug/Kg		114	80 - 134	2	50
2,3,4,6,7,8-HxCDF	0.100	0.115		ug/Kg		115	70 - 156	1	50
2,3,4,7,8-PeCDF	0.100	0.119		ug/Kg		119	68 - 160	0	50
2,3,7,8-TCDD	0.0200	0.0230		ug/Kg		115	67 - 158	4	50
2,3,7,8-TCDF	0.0200	0.0180		ug/Kg		90	75 - 158	7	50
OCDD	0.200	0.197		ug/Kg		98	78 - 144	1	50
OCDF	0.200	0.217		ug/Kg		109	63 - 170	1	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	69		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	74		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	69		20 - 186
13C-1,2,3,4,7,8-HxCDD	63		21 - 193
13C-1,2,3,4,7,8-HxCDF	80		19 - 202
13C-1,2,3,6,7,8-HxCDD	71		25 - 163
13C-1,2,3,6,7,8-HxCDF	82		21 - 159
13C-1,2,3,7,8,9-HxCDF	86		17 - 205
13C-1,2,3,7,8-PeCDD	52		21 - 227
13C-1,2,3,7,8-PeCDF	54		21 - 192
13C-2,3,4,6,7,8-HxCDF	83		22 - 176
13C-2,3,4,7,8-PeCDF	52		13 - 328
13C-2,3,7,8-TCDD	62		20 - 175
13C-2,3,7,8-TCDF	60		22 - 152
13C-OCDD	65		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl/4-2,3,7,8-TCDD	90		31 - 191

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 320-232323/1-A

Matrix: Solid

Analysis Batch: 233354

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 232323

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000229	J	0.0050	0.000032	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,4,6,7,8-HpCDF	0.000120	J	0.0050	0.000028	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,4,7,8,9-HpCDF	0.000117	J q	0.0050	0.000034	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,4,7,8-HxCDD	0.0000973	J q	0.0050	0.000039	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000067	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000037	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000060	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000036	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,7,8,9-HxCDF	0.000144	J	0.0050	0.000037	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000061	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
1,2,3,7,8-PeCDF	0.0000879	J q	0.0050	0.000043	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000041	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000048	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
2,3,7,8-TCDD	ND		0.0010	0.000050	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
2,3,7,8-TCDF	ND		0.0010	0.000030	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
OCDD	0.000919	J	0.010	0.000032	ug/Kg		07/03/18 11:49	07/10/18 14:02	1
OCDF	0.000134	J q	0.010	0.000036	ug/Kg		07/03/18 11:49	07/10/18 14:02	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	55		23 - 140	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,4,6,7,8-HpCDF	59		28 - 143	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,4,7,8,9-HpCDF	62		26 - 138	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,4,7,8-HxCDD	61		32 - 141	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,4,7,8-HxCDF	55		26 - 152	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,6,7,8-HxCDD	62		28 - 130	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,6,7,8-HxCDF	56		26 - 123	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,7,8,9-HxCDF	60		29 - 147	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,7,8-PeCDD	67		25 - 181	07/03/18 11:49	07/10/18 14:02	1
13C-1,2,3,7,8-PeCDF	73		24 - 185	07/03/18 11:49	07/10/18 14:02	1
13C-2,3,4,6,7,8-HxCDF	58		28 - 136	07/03/18 11:49	07/10/18 14:02	1
13C-2,3,4,7,8-PeCDF	72		21 - 178	07/03/18 11:49	07/10/18 14:02	1
13C-2,3,7,8-TCDD	64		25 - 164	07/03/18 11:49	07/10/18 14:02	1
13C-2,3,7,8-TCDF	69		24 - 169	07/03/18 11:49	07/10/18 14:02	1
13C-OCDD	56		17 - 157	07/03/18 11:49	07/10/18 14:02	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	115		35 - 197	07/03/18 11:49	07/10/18 14:02	1

Lab Sample ID: LCS 320-232323/2-A

Matrix: Solid

Analysis Batch: 233354

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 232323

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.114		ug/Kg		114	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.0961		ug/Kg		96	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.0961		ug/Kg		96	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.0959		ug/Kg		96	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.0990		ug/Kg		99	72 - 134

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCS 320-232323/2-A

Matrix: Solid

Analysis Batch: 233354

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 232323

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	0.100	0.0899		ug/Kg		90	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.102		ug/Kg		102	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.101		ug/Kg		101	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.0990		ug/Kg		99	78 - 130
1,2,3,7,8-PeCDD	0.100	0.109		ug/Kg		109	70 - 142
1,2,3,7,8-PeCDF	0.100	0.0964		ug/Kg		96	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.0984		ug/Kg		98	70 - 156
2,3,4,7,8-PeCDF	0.100	0.0959		ug/Kg		96	68 - 160
2,3,7,8-TCDD	0.0200	0.0212		ug/Kg		106	67 - 158
2,3,7,8-TCDF	0.0200	0.0184		ug/Kg		92	75 - 158
OCDD	0.200	0.214		ug/Kg		107	78 - 144
OCDF	0.200	0.195		ug/Kg		98	63 - 170

LCS LCS			
Isotope Dilution	%Recovery	Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	43		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	46		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	47		20 - 186
13C-1,2,3,4,7,8-HxCDD	47		21 - 193
13C-1,2,3,4,7,8-HxCDF	43		19 - 202
13C-1,2,3,6,7,8-HxCDD	48		25 - 163
13C-1,2,3,6,7,8-HxCDF	43		21 - 159
13C-1,2,3,7,8,9-HxCDF	47		17 - 205
13C-1,2,3,7,8-PeCDD	54		21 - 227
13C-1,2,3,7,8-PeCDF	59		21 - 192
13C-2,3,4,6,7,8-HxCDF	45		22 - 176
13C-2,3,4,7,8-PeCDF	58		13 - 328
13C-2,3,7,8-TCDD	51		20 - 175
13C-2,3,7,8-TCDF	54		22 - 152
13C-OCDD	44		13 - 199

LCS LCS			
Surrogate	%Recovery	Qualifier	Limits
37Cl/4-2,3,7,8-TCDD	110		31 - 191

Lab Sample ID: LCSD 320-232323/3-A

Matrix: Solid

Analysis Batch: 233354

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 232323

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.108		ug/Kg		108	70 - 140	5	50
1,2,3,4,6,7,8-HpCDF	0.100	0.0911		ug/Kg		91	82 - 122	5	50
1,2,3,4,7,8,9-HpCDF	0.100	0.0913		ug/Kg		91	78 - 138	5	50
1,2,3,4,7,8-HxCDD	0.100	0.0899		ug/Kg		90	70 - 164	6	50
1,2,3,4,7,8-HxCDF	0.100	0.0926		ug/Kg		93	72 - 134	7	50
1,2,3,6,7,8-HxCDD	0.100	0.0870		ug/Kg		87	76 - 134	3	50
1,2,3,6,7,8-HxCDF	0.100	0.0943		ug/Kg		94	84 - 130	8	50
1,2,3,7,8,9-HxCDD	0.100	0.0978		ug/Kg		98	64 - 162	3	50
1,2,3,7,8,9-HxCDF	0.100	0.0940		ug/Kg		94	78 - 130	5	50
1,2,3,7,8-PeCDD	0.100	0.105		ug/Kg		105	70 - 142	4	50

TestAmerica Seattle

QC Sample Results

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Method: 1613B - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: LCSD 320-232323/3-A

Matrix: Solid

Analysis Batch: 233354

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 232323

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	0.100	0.0905		ug/Kg		91	80 - 134	6	50
2,3,4,6,7,8-HxCDF	0.100	0.0937		ug/Kg		94	70 - 156	5	50
2,3,4,7,8-PeCDF	0.100	0.0900		ug/Kg		90	68 - 160	6	50
2,3,7,8-TCDD	0.0200	0.0205		ug/Kg		102	67 - 158	4	50
2,3,7,8-TCDF	0.0200	0.0173		ug/Kg		86	75 - 158	6	50
OCDD	0.200	0.199		ug/Kg		100	78 - 144	7	50
OCDF	0.200	0.184		ug/Kg		92	63 - 170	6	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	53		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	57		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	59		20 - 186
13C-1,2,3,4,7,8-HxCDD	58		21 - 193
13C-1,2,3,4,7,8-HxCDF	52		19 - 202
13C-1,2,3,6,7,8-HxCDD	58		25 - 163
13C-1,2,3,6,7,8-HxCDF	53		21 - 159
13C-1,2,3,7,8,9-HxCDF	58		17 - 205
13C-1,2,3,7,8-PeCDD	67		21 - 227
13C-1,2,3,7,8-PeCDF	74		21 - 192
13C-2,3,4,6,7,8-HxCDF	55		22 - 176
13C-2,3,4,7,8-PeCDF	71		13 - 328
13C-2,3,7,8-TCDD	63		20 - 175
13C-2,3,7,8-TCDF	68		22 - 152
13C-OCDD	55		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl/4-2,3,7,8-TCDD	111		31 - 191

TestAmerica Seattle

Lab Chronicle

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B301-BL1

Date Collected: 06/15/18 16:20

Date Received: 06/18/18 12:40

Lab Sample ID: 580-78153-1

Matrix: Solid

Percent Solids: 50.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		230306	06/21/18 15:50	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	231612	06/28/18 04:07	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox			230306	06/21/18 15:50	SR1	TAL SAC
Total/NA	Analysis	1613B		1	231356	06/27/18 18:40	ALM	TAL SAC

Client Sample ID: PDI-SG-B297-BL1

Date Collected: 06/15/18 15:33

Date Received: 06/18/18 12:40

Lab Sample ID: 580-78153-2

Matrix: Solid

Percent Solids: 50.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			230501	06/22/18 15:08	SR1	TAL SAC
Total/NA	Analysis	1613B		1	232728	07/05/18 23:23	AS	TAL SAC

Client Sample ID: PDI-SG-B293-BL1

Date Collected: 06/15/18 14:50

Date Received: 06/18/18 12:40

Lab Sample ID: 580-78153-3

Matrix: Solid

Percent Solids: 44.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			232323	07/03/18 11:49	SR1	TAL SAC
Total/NA	Analysis	1613B		1	233354	07/10/18 16:20	SMA	TAL SAC

Client Sample ID: PDI-SG-B310-BL1

Date Collected: 06/15/18 13:26

Date Received: 06/18/18 12:40

Lab Sample ID: 580-78153-4

Matrix: Solid

Percent Solids: 39.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		230501	06/22/18 15:08	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	232868	07/06/18 20:53	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			230501	06/22/18 15:08	SR1	TAL SAC
Total/NA	Analysis	1613B		1	232728	07/06/18 00:06	AS	TAL SAC

Client Sample ID: PDI-SG-B309-BL1

Date Collected: 06/15/18 12:25

Date Received: 06/18/18 12:40

Lab Sample ID: 580-78153-5

Matrix: Solid

Percent Solids: 40.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			230306	06/21/18 15:50	SR1	TAL SAC
Total/NA	Analysis	1613B		1	231552	06/28/18 03:25	AS	TAL SAC

TestAmerica Seattle

Lab Chronicle

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

Client Sample ID: PDI-SG-B314-BL1

Lab Sample ID: 580-78153-6

Date Collected: 06/16/18 14:16

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 68.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			230306	06/21/18 15:50	SR1	TAL SAC
Total/NA	Analysis	1613B		1	231552	06/28/18 04:11	AS	TAL SAC

Client Sample ID: PDI-SG-B030-BL1

Lab Sample ID: 580-78153-7

Date Collected: 06/17/18 12:11

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 37.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			230306	06/21/18 15:50	SR1	TAL SAC
Total/NA	Analysis	1613B		1	231552	06/28/18 04:57	AS	TAL SAC

Client Sample ID: PDI-SG-B031-BL1

Lab Sample ID: 580-78153-8

Date Collected: 06/17/18 11:20

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 37.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			230306	06/21/18 15:50	SR1	TAL SAC
Total/NA	Analysis	1613B		1	231552	06/28/18 05:43	AS	TAL SAC

Client Sample ID: PDI-SG-B042-BL1

Lab Sample ID: 580-78153-9

Date Collected: 06/17/18 14:46

Matrix: Solid

Date Received: 06/18/18 12:40

Percent Solids: 63.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		230501	06/22/18 15:08	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	232868	07/06/18 21:33	KSS	TAL SAC
Total/NA	Prep	HRMS-Sox			230501	06/22/18 15:08	SR1	TAL SAC
Total/NA	Analysis	1613B		1	232728	07/06/18 00:49	AS	TAL SAC

Client Sample ID: PDI-RB-VV-20160616

Lab Sample ID: 580-78153-10

Date Collected: 06/16/18 16:30

Matrix: Water

Date Received: 06/18/18 12:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			229950	06/20/18 08:13	A1A	TAL SAC
Total/NA	Analysis	1613B		1	231187	06/27/18 04:40	AS	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

TestAmerica Seattle

Accreditation/Certification Summary

Client: AECOM

TestAmerica Job ID: 580-78153-2

Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-18
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-18 *
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-18 *
USDA	Federal		P330-11-00436	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Seattle

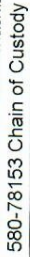
Sample Summary

Client: AECOM

TestAmerica Job ID: 580-78153-2

Project/Site: Portland Harbor Pre-Remedial Design

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78153-1	PDI-SG-B301-BL1	Solid	06/15/18 16:20	06/18/18 12:40
580-78153-2	PDI-SG-B297-BL1	Solid	06/15/18 15:33	06/18/18 12:40
580-78153-3	PDI-SG-B293-BL1	Solid	06/15/18 14:50	06/18/18 12:40
580-78153-4	PDI-SG-B310-BL1	Solid	06/15/18 13:26	06/18/18 12:40
580-78153-5	PDI-SG-B309-BL1	Solid	06/15/18 12:25	06/18/18 12:40
580-78153-6	PDI-SG-B314-BL1	Solid	06/16/18 14:16	06/18/18 12:40
580-78153-7	PDI-SG-B030-BL1	Solid	06/17/18 12:11	06/18/18 12:40
580-78153-8	PDI-SG-B031-BL1	Solid	06/17/18 11:20	06/18/18 12:40
580-78153-9	PDI-SG-B042-BL1	Solid	06/17/18 14:46	06/18/18 12:40
580-78153-10	PDI-RB-VV-20160616	Water	06/16/18 16:30	06/18/18 12:40



CHAIN OF CUSTODY



580-78153 Chain of Custody

TestAmerica-Seattle		SURFACE SEDIMENT CHAIN OF CUSTODY										6/18/2018		COC No. 1					
5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047		Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010				Site Contact: Jennifer Ray				Laboratory Contact: Elaine-Walker				Carrier: Courier		1 of 1 page(s)			
Client Contact		Analysis Turnaround Time				Calendar (C) or Work Days (W)													
AECOM 1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1+(866) 495-5288		☒ 21 days																	
Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling		☐ Other																	
Portland, OR																			
Project #: 60566335 Study: Surface Sediment																			
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 16&A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury, NWTPH-D, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon 9060, Total solids 104C & 70C	Archive Archive -20 C	WQ-RB Congeners 16&8A	WQ-RB 1613B	WQ-TPH Diesel NWTPH-DX	WQ-Metals Hg 6020B 7471A	WQ-TOC 5M5310B	Sample Specific Notes:
PDI-SG-B301-BL1	6/15/2018	16:20	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B297-BL1	6/15/2018	15:33	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B293-BL1	6/15/2018	14:50	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B310-BL1	6/15/2018	13:26	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B309-BL1	6/15/2018	12:25	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B314-BL1	6/16/2018	14:16	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B030-BL1	6/17/2018	12:11	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B031-BL1	6/17/2018	11:20	SS	MS/MSD	MM	12		x	x	x	x	x	x						
PDI-SG-B042-BL1	6/17/2018	14:46	SS		MM	6		x	x	x	x	x	x						
PDI-RB-VV-20160616	6/16/18	1630	W		MM	8								x	x	x	x	x	
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column																			
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid																			
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)																			
Sample Disposal ☐ Return To Client ☒ Disposal By Lab ☒ Archive For 12 Months																			
Special Instructions/QC Requirements & Comments: Separate reports for each lab.																			
5.3, 5.1, 3.4																			
Relinquished by: [Signature]	Company: AECOM	Date/Time: 6/18/18 1200	Received by: [Signature]		Company: M.E.	Date/Time: 6-18-18 /1200													
Relinquished by: [Signature]	Company: M.E.	Date/Time: 6/18/18 1240	Received by: [Signature]		Company: TAPOR	Date/Time: 6/18/18 1240													
Relinquished by: [Signature]	Company: TAPOR	Date/Time: 6/18/18 1700	Received by: [Signature]		Company: Tasea	Date/Time: 6/19/18 0940													

IR522-7/2.7 W/L-3-

THE LEADER IN ENVIRONMENTAL TESTING



THE LEADER IN ENVIRONMENTAL TESTING

Ver: 09/20/2016

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78153-2

Login Number: 78153

List Source: TestAmerica Seattle

List Number: 1

Creator: O'Connell, Jason I

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78153-2

Login Number: 78153

List Source: TestAmerica Sacramento

List Number: 4

List Creation: 06/19/18 04:11 PM

Creator: Her, David A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.2c, 0.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78153-2

Login Number: 78153

List Source: TestAmerica Sacramento

List Number: 5

List Creation: 06/19/18 04:13 PM

Creator: Her, David A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.2c, 0.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING



580-78153 Field Sheet

Job: _____

Tracking # 4423 0750 5407

SO / PO / FO / UPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes: Out jars TM 6/19/18

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other _____

Ice ☒ Wet ☒ Gel _____ Other _____

Cooler Custody Seal: Sealed

Sample Custody Seal: -

Cooler ID: 1 of 2

Temp: Observed 0.2°C

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☐	☐	☒
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: TM Date: 6/19/18 Time 1020

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")



THE LEADER IN ENVIRONMENTAL TESTING

Sacramento Sample Receiving Notes

Job: _____

Tracking # 4423 0750 5418 SO / PO / FO / UPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Notes: 8 oz jars & 2x/L amber
TM 6/19/18

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other _____

Ice ☒ Wet ☒ Gel _____ Other _____

Cooler Custody Seal: Sealed

Sample Custody Seal: _____

Cooler ID: 2 of 2

Temp: Observed 0.0°C

From: Temp Blank ☐ Sample ☒

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☐	☐	☒
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: TM Date: 6/19/18 Time 1030

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Date: 6/18/18

Signature: _____

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ORIGIN ID: BNOA (503) 906-9240
SAMPLE CONTROL
TESTAMERICA PORTLAND
8920 SW GEMINI DR
BUILDING 7
BEAVERTON, OR 970087145
UNITED STATES US

SHIP DATE: 18JUN18
ACTWGT: 55.00 LB MAN
CAD: 0996922/CAFE3210

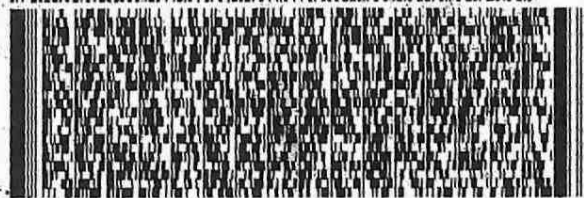
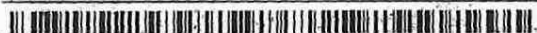
BILL RECIPIENT

**TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
880 RIVERSIDE PARKWAY**

WEST SACRAMENTO CA 95605

(916) 373-5800

REF: S580 - 29311



FedEx
Express



1 of 2

TRK# 4423 0750 5407
0201

##-MASTER ##

WD BLUA

TUE - 19 JUN 10:30A
PRIORITY OVERNIGHT

95605

CA-US SMF

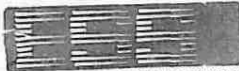


RT 362

1
10:30

A
540
06.19

CUSTODY SEAL



ENVIRONMENTAL SAMPLING SUPPLY
www.essvial.com 800-233-8425

Date: 6/18/18

Signature: *AK*

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Part # 159370-434 RIT 12/11

ORIGIN ID: BNOA (503) 906-9240
SAMPLE CONTROL
TESTAMERICA PORTLAND
8920 SW GEMINI DR
BUILDING 7
BEAVERTON, OR 970087145
UNITED STATES US

SHIP DATE: 18 JUN 18
ACTWGT: 55.00 LB MAN
CAD: 0996922/CAGE3210

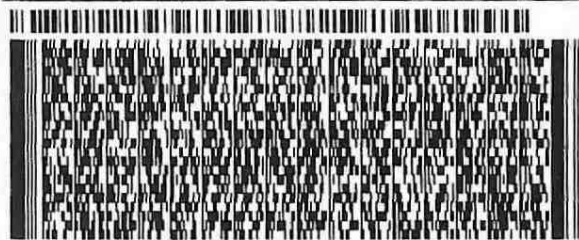
BILL RECIPIENT

TO SHIPPING/RECEIVING
TESTAMERICA LABORATORIES, INC.
880 RIVERSIDE PARKWAY

WEST SACRAMENTO CA 95605

(916) 373-5600

REF: S580-29311



FedEx
Express



2 of 2

MPS# 4423 0750 5418

Mstr# 4423 0750 5407

0201

TUE - 19 JUN 10:30A
PRIORITY OVERNIGHT

WD BLUA

95605
CA-US SMF



RT 362
FZ

1 10:30 A
5418
06.19

Isotope Dilution Summary

Client: AECOM

TestAmerica Job ID: 580-78153-2

Project/Site: Portland Harbor Pre-Remedial Design

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-78153-1	PDI-SG-B301-BL1	45	41	45	56	57	57	57	57
580-78153-1 - RA	PDI-SG-B301-BL1								
580-78153-2	PDI-SG-B297-BL1	54	49	54	46	62	50	65	68
580-78153-3	PDI-SG-B293-BL1	32	29	37	39	35	39	35	42
580-78153-4	PDI-SG-B310-BL1	51	46	55	52	64	54	69	67
580-78153-4 - RA	PDI-SG-B310-BL1								
580-78153-5	PDI-SG-B309-BL1	42	48	52	56	55	58	57	60
580-78153-6	PDI-SG-B314-BL1	43	51	52	54	54	57	55	58
580-78153-7	PDI-SG-B030-BL1	46	54	56	58	57	61	58	63
580-78153-8	PDI-SG-B031-BL1	46	54	56	57	56	59	57	61
580-78153-9	PDI-SG-B042-BL1	56	60	59	64	80	63	79	82
580-78153-9 - RA	PDI-SG-B042-BL1								
MB 320-230306/1-A	Method Blank	63	64	59	63	68	77	68	64
MB 320-230501/1-A	Method Blank	67	74	70	58	81	66	83	84
MB 320-232323/1-A	Method Blank	55	59	62	61	55	62	56	60

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)						
		PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-78153-1	PDI-SG-B301-BL1	72	60	55	60	59		45
580-78153-1 - RA	PDI-SG-B301-BL1						59	
580-78153-2	PDI-SG-B297-BL1	45	46	69	47	56	58	50
580-78153-3	PDI-SG-B293-BL1	50	57	39	58	51	62	29
580-78153-4	PDI-SG-B310-BL1	44	47	68	48	55		52
580-78153-4 - RA	PDI-SG-B310-BL1						52	
580-78153-5	PDI-SG-B309-BL1	59	71	55	72	66	78	36
580-78153-6	PDI-SG-B314-BL1	55	66	54	66	61	70	35
580-78153-7	PDI-SG-B030-BL1	60	72	58	72	65	77	40
580-78153-8	PDI-SG-B031-BL1	60	72	57	72	66	78	40
580-78153-9	PDI-SG-B042-BL1	53	55	74	52	57		60
580-78153-9 - RA	PDI-SG-B042-BL1						58	
MB 320-230306/1-A	Method Blank	84	67	66	65	66	65	61
MB 320-230501/1-A	Method Blank	58	62	83	57	65	67	66
MB 320-232323/1-A	Method Blank	67	73	58	72	64	69	56

Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
 HxCDD = 13C-1,2,3,4,7,8-HxCDD
 HxCDF = 13C-1,2,3,4,7,8-HxCDF
 HxDD = 13C-1,2,3,6,7,8-HxCDD
 HxDF = 13C-1,2,3,6,7,8-HxCDF
 HxCF = 13C-1,2,3,7,8,9-HxCDF
 PeCDD = 13C-1,2,3,7,8-PeCDD
 PeCDF = 13C-1,2,3,7,8-PeCDF
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF
 PeCF = 13C-2,3,4,7,8-PeCDF
 TCDD = 13C-2,3,7,8-TCDD
 TCDF = 13C-2,3,7,8-TCDF

TestAmerica Seattle

Isotope Dilution Summary

Client: AECOM
Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78153-2

OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-230306/2-A	Lab Control Sample	65	63	62	68	68	76	70	68
LCS 320-230501/2-A	Lab Control Sample	63	67	63	59	76	61	76	77
LCS 320-232323/2-A	Lab Control Sample	43	46	47	47	43	48	43	47
LCSD 320-230306/3-A	Lab Control Sample Dup	61	61	57	67	66	71	68	64
LCSD 320-230501/3-A	Lab Control Sample Dup	69	74	69	63	80	71	82	86
LCSD 320-232323/3-A	Lab Control Sample Dup	53	57	59	58	52	58	53	58

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 320-230306/2-A	Lab Control Sample	91	72	67	70	70	70	64
LCS 320-230501/2-A	Lab Control Sample	53	55	76	54	62	63	61
LCS 320-232323/2-A	Lab Control Sample	54	59	45	58	51	54	44
LCSD 320-230306/3-A	Lab Control Sample Dup	81	67	65	65	65	64	58
LCSD 320-230501/3-A	Lab Control Sample Dup	52	54	83	52	62	60	65
LCSD 320-232323/3-A	Lab Control Sample Dup	67	74	55	71	63	68	55

Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
 HxCDD = 13C-1,2,3,4,7,8-HxCDD
 HxCDF = 13C-1,2,3,4,7,8-HxCDF
 HxDD = 13C-1,2,3,6,7,8-HxCDD
 HxDF = 13C-1,2,3,6,7,8-HxCDF
 HxCF = 13C-1,2,3,7,8,9-HxCDF
 PeCDD = 13C-1,2,3,7,8-PeCDD
 PeCDF = 13C-1,2,3,7,8-PeCDF
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF
 PeCF = 13C-2,3,4,7,8-PeCDF
 TCDD = 13C-2,3,7,8-TCDD
 TCDF = 13C-2,3,7,8-TCDF
 OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-78153-10	PDI-RB-VV-20160616	77	77	81	67	74	61	64	75
MB 320-229950/1-A	Method Blank	61	61	63	61	63	54	58	67

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-78153-10	PDI-RB-VV-20160616	72	72	70	70	74	83	80
MB 320-229950/1-A	Method Blank	70	68	65	71	67	79	58

TestAmerica Seattle

Isotope Dilution Summary

Client: AECOM

TestAmerica Job ID: 580-78153-2

Project/Site: Portland Harbor Pre-Remedial Design

Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
 HxCDD = 13C-1,2,3,4,7,8-HxCDD
 HxCDF = 13C-1,2,3,4,7,8-HxCDF
 HxDD = 13C-1,2,3,6,7,8-HxCDD
 HxDF = 13C-1,2,3,6,7,8-HxCDF
 HxCF = 13C-1,2,3,7,8,9-HxCDF
 PeCDD = 13C-1,2,3,7,8-PeCDD
 PeCDF = 13C-1,2,3,7,8-PeCDF
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF
 PeCF = 13C-2,3,4,7,8-PeCDF
 TCDD = 13C-2,3,7,8-TCDD
 TCDF = 13C-2,3,7,8-TCDF
 OCDD = 13C-OCDD

Method: 1613B - Dioxins and Furans (HRGC/HRMS)

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-229950/2-A	Lab Control Sample	71	69	72	66	66	56	60	68
LCSD 320-229950/3-A	Lab Control Sample Dup	56	55	58	50	53	45	46	53

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 320-229950/2-A	Lab Control Sample	71	71	67	71	69	80	70
LCSD 320-229950/3-A	Lab Control Sample Dup	54	56	50	57	61	73	58

Surrogate Legend

HpCDD = 13C-1,2,3,4,6,7,8-HpCDD
 HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
 HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
 HxCDD = 13C-1,2,3,4,7,8-HxCDD
 HxCDF = 13C-1,2,3,4,7,8-HxCDF
 HxDD = 13C-1,2,3,6,7,8-HxCDD
 HxDF = 13C-1,2,3,6,7,8-HxCDF
 HxCF = 13C-1,2,3,7,8,9-HxCDF
 PeCDD = 13C-1,2,3,7,8-PeCDD
 PeCDF = 13C-1,2,3,7,8-PeCDF
 13CHxCF = 13C-2,3,4,6,7,8-HxCDF
 PeCF = 13C-2,3,4,7,8-PeCDF
 TCDD = 13C-2,3,7,8-TCDD
 TCDF = 13C-2,3,7,8-TCDF
 OCDD = 13C-OCDD

TestAmerica Seattle