

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-77769-2

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

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Authorized for release by:
6/25/2018 4:01:15 PM

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

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Case Narrative

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

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Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-77769-2

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

Eight samples were received on 6/4/2018 2:25 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.9° C and 3.0° C.

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

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

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-S109 (580-77769-1), PDI-SG-S113 (580-77769-2), PDI-SG-S116 (580-77769-3), PDI-SG-S116-D (580-77769-4), PDI-SG-S015 (580-77769-5), PDI-SG-S203 (580-77769-6), PDI-SG-S203-D (580-77769-7) and PDI-SG-S176 (580-77769-8) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/13/2018 and 06/14/2018 and analyzed on 06/19/2018, 06/20/2018, 06/21/2018 and 06/22/2018.

1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF and 2,3,7,8-TCDF were detected in method blank MB 320-228869/1-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.

Several analytes were detected in method blank MB 320-229025/1-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.

The automated resolution check scheduled to be performed after the following samples did not complete due to a blown filament. Analyst replaced the filament with a new one and without tuning the instrument performed a manual ending resolution check. The ending resolution indicated the instrument maintained greater than 10,000 resolution. The delay in printing the ending resolution check has no impact on the data.

(LCS 320-228869/2-A), (LCSD 320-228869/3-A), (MB 320-228869/1-A) and (WDM 320-229749/3)

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and

Case Narrative

Client: AECOM
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Laboratory: TestAmerica Seattle (Continued)

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-S109 (580-77769-1), PDI-SG-S113 (580-77769-2), PDI-SG-S116-D (580-77769-4), PDI-SG-S015 (580-77769-5), PDI-SG-S203 (580-77769-6), PDI-SG-S203-D (580-77769-7), PDI-SG-S176 (580-77769-8), (CCV 320-229932/2) and (WDM 320-229932/1). 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.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: PDI-SG-S203 (580-77769-6), PDI-SG-S203-D (580-77769-7) and PDI-SG-S176 (580-77769-8). These analytes have been qualified; however, the peaks did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

The following samples exhibited elevated noise or matrix interferences for one or more analytes causing elevation of the detection limit (EDL): PDI-SG-S203 (580-77769-6) and PDI-SG-S203-D (580-77769-7). The reporting limit (RL) for the affected analytes has been raised to be equal to the EDL, and a "G" qualifier applied.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-S109 (580-77769-1), PDI-SG-S113 (580-77769-2), PDI-SG-S116 (580-77769-3), PDI-SG-S116-D (580-77769-4), PDI-SG-S015 (580-77769-5), PDI-SG-S203 (580-77769-6), PDI-SG-S203-D (580-77769-7) and PDI-SG-S176 (580-77769-8). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-228869.

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

Definitions/Glossary

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

TestAmerica Job ID: 580-77769-2

Qualifiers

Dioxin

Qualifier	Qualifier Description
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.
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.
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference
E	Result exceeded calibration range.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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: 580-77769-2

Client Sample ID: PDI-SG-S109

Date Collected: 06/01/18 11:25

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-1

Matrix: Solid

Percent Solids: 62.7

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	0.042		0.0040	0.00057	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,4,6,7,8-HpCDF	0.0055		0.0040	0.00010	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,4,7,8,9-HpCDF	0.0015	J B	0.0040	0.00011	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,4,7,8-HxCDD	0.00034	J	0.0040	0.000057	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,4,7,8-HxCDF	0.0033	J B	0.0040	0.000068	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,6,7,8-HxCDD	0.0012	J	0.0040	0.000055	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,6,7,8-HxCDF	0.00095	J	0.0040	0.000074	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,7,8,9-HxCDD	0.00082	J	0.0040	0.000052	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,7,8,9-HxCDF	0.0010	J B	0.0040	0.000034	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,7,8-PeCDD	0.00027	J	0.0040	0.000067	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
1,2,3,7,8-PeCDF	0.0016	J	0.0040	0.000055	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
2,3,4,6,7,8-HxCDF	0.00021	J	0.0040	0.000042	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
2,3,4,7,8-PeCDF	0.00068	J	0.0040	0.000062	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
2,3,7,8-TCDD	0.00024	J q	0.00080	0.000069	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
OCDD	0.31		0.0080	0.00057	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
OCDF	0.016		0.0080	0.000039	ug/Kg	☼	06/13/18 12:12	06/19/18 21:03	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	41		23 - 140				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,4,6,7,8-HpCDF	45		28 - 143				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,4,7,8,9-HpCDF	51		26 - 138				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,4,7,8-HxCDD	51		32 - 141				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,4,7,8-HxCDF	47		26 - 152				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,6,7,8-HxCDD	47		28 - 130				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,6,7,8-HxCDF	45		26 - 123				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,7,8,9-HxCDF	53		29 - 147				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,7,8-PeCDD	56		25 - 181				06/13/18 12:12	06/19/18 21:03	1
13C-1,2,3,7,8-PeCDF	64		24 - 185				06/13/18 12:12	06/19/18 21:03	1
13C-2,3,4,6,7,8-HxCDF	46		28 - 136				06/13/18 12:12	06/19/18 21:03	1
13C-2,3,4,7,8-PeCDF	64		21 - 178				06/13/18 12:12	06/19/18 21:03	1
13C-2,3,7,8-TCDD	57		25 - 164				06/13/18 12:12	06/19/18 21:03	1
13C-OCDD	38		17 - 157				06/13/18 12:12	06/19/18 21:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	120		35 - 197				06/13/18 12:12	06/19/18 21:03	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	0.0015	B	0.00080	0.00024	ug/Kg	☼	06/13/18 12:12	06/21/18 16:12	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	68		24 - 169				06/13/18 12:12	06/21/18 16:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	110		35 - 197				06/13/18 12:12	06/21/18 16:12	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S113

Date Collected: 06/01/18 11:15

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-2

Matrix: Solid

Percent Solids: 56.2

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	0.071		0.0044	0.0025	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,4,6,7,8-HpCDF	0.092		0.0044	0.0022	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,4,7,8,9-HpCDF	0.033	B	0.0044	0.0022	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,4,7,8-HxCDD	0.00065	J q	0.0044	0.00039	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,4,7,8-HxCDF	0.045	B	0.0044	0.0015	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,6,7,8-HxCDD	0.0025	J	0.0044	0.00035	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,6,7,8-HxCDF	0.014		0.0044	0.0014	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,7,8,9-HxCDD	0.0017	J q	0.0044	0.00034	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,7,8,9-HxCDF	0.0013	J B	0.0044	0.00074	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,7,8-PeCDD	0.00058	J q	0.0044	0.00021	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
1,2,3,7,8-PeCDF	0.0074		0.0044	0.00042	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
2,3,4,6,7,8-HxCDF	0.0018	J	0.0044	0.0010	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
2,3,4,7,8-PeCDF	0.0024	J	0.0044	0.00046	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
2,3,7,8-TCDD	0.00034	J	0.00088	0.000075	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
OCDD	0.59		0.0088	0.00076	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
OCDF	0.61		0.0088	0.00063	ug/Kg	☼	06/13/18 12:12	06/19/18 21:49	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	48		23 - 140				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,4,6,7,8-HpCDF	53		28 - 143				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,4,7,8,9-HpCDF	61		26 - 138				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,4,7,8-HxCDD	49		32 - 141				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,4,7,8-HxCDF	47		26 - 152				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,6,7,8-HxCDD	59		28 - 130				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,6,7,8-HxCDF	52		26 - 123				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,7,8,9-HxCDF	57		29 - 147				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,7,8-PeCDD	55		25 - 181				06/13/18 12:12	06/19/18 21:49	1
13C-1,2,3,7,8-PeCDF	65		24 - 185				06/13/18 12:12	06/19/18 21:49	1
13C-2,3,4,6,7,8-HxCDF	52		28 - 136				06/13/18 12:12	06/19/18 21:49	1
13C-2,3,4,7,8-PeCDF	63		21 - 178				06/13/18 12:12	06/19/18 21:49	1
13C-2,3,7,8-TCDD	71		25 - 164				06/13/18 12:12	06/19/18 21:49	1
13C-OCDD	43		17 - 157				06/13/18 12:12	06/19/18 21:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	115		35 - 197				06/13/18 12:12	06/19/18 21:49	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	0.0054	B	0.00088	0.00037	ug/Kg	☼	06/13/18 12:12	06/21/18 16:50	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	56		24 - 169				06/13/18 12:12	06/21/18 16:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	105		35 - 197				06/13/18 12:12	06/21/18 16:50	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S116

Date Collected: 06/01/18 09:55

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-3

Matrix: Solid

Percent Solids: 64.6

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	0.035	B	0.0039	0.00016	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,4,6,7,8-HpCDF	0.012	B	0.0039	0.00011	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,4,7,8,9-HpCDF	0.0031	J B	0.0039	0.00012	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,4,7,8-HxCDD	0.00049	J B	0.0039	0.000050	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,4,7,8-HxCDF	0.015	B	0.0039	0.000092	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,6,7,8-HxCDD	0.0016	J q B	0.0039	0.000051	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,6,7,8-HxCDF	0.0039	B	0.0039	0.000083	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,7,8,9-HxCDD	0.0011	J B	0.0039	0.000045	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,7,8,9-HxCDF	0.00075	J B	0.0039	0.000064	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,7,8-PeCDD	0.00025	J	0.0039	0.000053	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
1,2,3,7,8-PeCDF	0.0082	B	0.0039	0.000098	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
2,3,4,6,7,8-HxCDF	0.00060	J B	0.0039	0.000073	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
2,3,4,7,8-PeCDF	0.0025	J B	0.0039	0.00011	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
2,3,7,8-TCDD	0.00023	J q B	0.00077	0.000030	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
OCDD	0.33	B	0.0077	0.00017	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1
OCDF	0.021	B	0.0077	0.000093	ug/Kg	☼	06/14/18 09:34	06/20/18 04:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	47		23 - 140	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,4,6,7,8-HpCDF	38		28 - 143	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,4,7,8,9-HpCDF	46		26 - 138	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,4,7,8-HxCDD	66		32 - 141	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,4,7,8-HxCDF	70		26 - 152	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,6,7,8-HxCDD	57		28 - 130	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,6,7,8-HxCDF	63		26 - 123	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,7,8,9-HxCDF	62		29 - 147	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,7,8-PeCDD	61		25 - 181	06/14/18 09:34	06/20/18 04:40	1
13C-1,2,3,7,8-PeCDF	61		24 - 185	06/14/18 09:34	06/20/18 04:40	1
13C-2,3,4,6,7,8-HxCDF	63		28 - 136	06/14/18 09:34	06/20/18 04:40	1
13C-2,3,4,7,8-PeCDF	60		21 - 178	06/14/18 09:34	06/20/18 04:40	1
13C-2,3,7,8-TCDD	58		25 - 164	06/14/18 09:34	06/20/18 04:40	1
13C-OCDD	51		17 - 157	06/14/18 09:34	06/20/18 04:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	109		35 - 197	06/14/18 09:34	06/20/18 04:40	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	0.0063	B	0.00077	0.00011	ug/Kg	☼	06/14/18 09:34	06/21/18 00:30	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	67		24 - 169	06/14/18 09:34	06/21/18 00:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	105		35 - 197	06/14/18 09:34	06/21/18 00:30	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S116-D

Date Collected: 06/01/18 09:55

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-4

Matrix: Solid

Percent Solids: 64.5

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	0.018		0.0038	0.00046	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,4,6,7,8-HpCDF	0.0038	q	0.0038	0.000087	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,4,7,8,9-HpCDF	0.0013	J B	0.0038	0.000087	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,4,7,8-HxCDD	0.00026	J	0.0038	0.000076	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,4,7,8-HxCDF	0.0040	B	0.0038	0.00019	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,6,7,8-HxCDD	0.00066	J	0.0038	0.000066	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,6,7,8-HxCDF	0.0012	J	0.0038	0.00019	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,7,8,9-HxCDD	0.00047	J	0.0038	0.000066	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,7,8,9-HxCDF	0.00065	J B	0.0038	0.000095	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,7,8-PeCDD	0.00013	J q	0.0038	0.000081	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
1,2,3,7,8-PeCDF	0.0016	J	0.0038	0.000085	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
2,3,4,6,7,8-HxCDF	ND		0.0038	0.00013	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
2,3,4,7,8-PeCDF	0.00059	J	0.0038	0.000090	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
2,3,7,8-TCDD	0.00097		0.00077	0.000041	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
OCDD	0.19		0.0077	0.00031	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
OCDF	0.011		0.0077	0.000037	ug/Kg	☼	06/13/18 12:12	06/19/18 22:35	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	47		23 - 140				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,4,6,7,8-HpCDF	52		28 - 143				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,4,7,8,9-HpCDF	59		26 - 138				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,4,7,8-HxCDD	49		32 - 141				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,4,7,8-HxCDF	48		26 - 152				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,6,7,8-HxCDD	58		28 - 130				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,6,7,8-HxCDF	52		26 - 123				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,7,8,9-HxCDF	56		29 - 147				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,7,8-PeCDD	56		25 - 181				06/13/18 12:12	06/19/18 22:35	1
13C-1,2,3,7,8-PeCDF	68		24 - 185				06/13/18 12:12	06/19/18 22:35	1
13C-2,3,4,6,7,8-HxCDF	52		28 - 136				06/13/18 12:12	06/19/18 22:35	1
13C-2,3,4,7,8-PeCDF	71		21 - 178				06/13/18 12:12	06/19/18 22:35	1
13C-2,3,7,8-TCDD	70		25 - 164				06/13/18 12:12	06/19/18 22:35	1
13C-OCDD	42		17 - 157				06/13/18 12:12	06/19/18 22:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	118		35 - 197				06/13/18 12:12	06/19/18 22:35	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	0.0019	B	0.00077	0.00022	ug/Kg	☼	06/13/18 12:12	06/21/18 17:28	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	67		24 - 169				06/13/18 12:12	06/21/18 17:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	108		35 - 197				06/13/18 12:12	06/21/18 17:28	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S015

Date Collected: 06/02/18 11:45

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-5

Matrix: Solid

Percent Solids: 37.6

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	0.095		0.0067	0.00097	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,4,6,7,8-HpCDF	0.013	q	0.0067	0.00018	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,4,7,8,9-HpCDF	0.0017	J B	0.0067	0.00020	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,4,7,8-HxCDD	0.00083	J	0.0067	0.000092	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,4,7,8-HxCDF	0.0019	J B	0.0067	0.00016	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,6,7,8-HxCDD	0.0027	J	0.0067	0.000085	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,6,7,8-HxCDF	0.00072	J	0.0067	0.00016	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,7,8,9-HxCDD	0.0019	J	0.0067	0.000082	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,7,8,9-HxCDF	0.0011	J B	0.0067	0.000083	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,7,8-PeCDD	0.00045	J	0.0067	0.00011	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
1,2,3,7,8-PeCDF	0.00080	J	0.0067	0.000070	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
2,3,4,6,7,8-HxCDF	0.00040	J	0.0067	0.00011	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
2,3,4,7,8-PeCDF	0.00052	J	0.0067	0.000077	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
2,3,7,8-TCDD	0.00025	J q	0.0013	0.000076	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
2,3,7,8-TCDF	0.0011	J B	0.0013	0.000064	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
OCDD	0.76		0.013	0.00056	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1
OCDF	0.057		0.013	0.000059	ug/Kg	☼	06/13/18 12:12	06/19/18 23:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	54		23 - 140	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,4,6,7,8-HpCDF	58		28 - 143	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,4,7,8,9-HpCDF	65		26 - 138	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,4,7,8-HxCDD	57		32 - 141	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,4,7,8-HxCDF	57		26 - 152	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,6,7,8-HxCDD	54		28 - 130	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,6,7,8-HxCDF	53		26 - 123	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,7,8,9-HxCDF	60		29 - 147	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,7,8-PeCDD	59		25 - 181	06/13/18 12:12	06/19/18 23:21	1
13C-1,2,3,7,8-PeCDF	69		24 - 185	06/13/18 12:12	06/19/18 23:21	1
13C-2,3,4,6,7,8-HxCDF	54		28 - 136	06/13/18 12:12	06/19/18 23:21	1
13C-2,3,4,7,8-PeCDF	68		21 - 178	06/13/18 12:12	06/19/18 23:21	1
13C-2,3,7,8-TCDD	64		25 - 164	06/13/18 12:12	06/19/18 23:21	1
13C-2,3,7,8-TCDF	73		24 - 169	06/13/18 12:12	06/19/18 23:21	1
13C-OCDD	52		17 - 157	06/13/18 12:12	06/19/18 23:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	121		35 - 197	06/13/18 12:12	06/19/18 23:21	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S203

Date Collected: 06/02/18 11:32

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-6

Matrix: Solid

Percent Solids: 31.0

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	1.4	G	0.012	0.012	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,4,6,7,8-HpCDF	0.42		0.0079	0.0041	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,4,7,8,9-HpCDF	0.026	B	0.0079	0.0044	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,4,7,8-HxCDD	0.0044	J	0.0079	0.00061	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,4,7,8-HxCDF	0.050	B	0.0079	0.0020	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,6,7,8-HxCDD	0.036		0.0079	0.00060	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,6,7,8-HxCDF	0.0089		0.0079	0.0022	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,7,8,9-HxCDD	0.0088		0.0079	0.00057	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,7,8,9-HxCDF	0.0017	J B	0.0079	0.0011	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,7,8-PeCDD	0.0021	J	0.0079	0.00031	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
1,2,3,7,8-PeCDF	0.0014	J q	0.0079	0.00069	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
2,3,4,6,7,8-HxCDF	0.0041	J	0.0079	0.0015	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
2,3,4,7,8-PeCDF	0.0053	J	0.0079	0.00076	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
2,3,7,8-TCDD	0.00089	J	0.0016	0.00012	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
OCDD	10	E	0.016	0.0039	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
OCDF	2.0		0.016	0.00039	ug/Kg	☼	06/13/18 12:12	06/20/18 00:07	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	56		23 - 140				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,4,6,7,8-HpCDF	62		28 - 143				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,4,7,8,9-HpCDF	66		26 - 138				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,4,7,8-HxCDD	62		32 - 141				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,4,7,8-HxCDF	62		26 - 152				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,6,7,8-HxCDD	60		28 - 130				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,6,7,8-HxCDF	57		26 - 123				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,7,8,9-HxCDF	65		29 - 147				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,7,8-PeCDD	65		25 - 181				06/13/18 12:12	06/20/18 00:07	1
13C-1,2,3,7,8-PeCDF	77		24 - 185				06/13/18 12:12	06/20/18 00:07	1
13C-2,3,4,6,7,8-HxCDF	58		28 - 136				06/13/18 12:12	06/20/18 00:07	1
13C-2,3,4,7,8-PeCDF	76		21 - 178				06/13/18 12:12	06/20/18 00:07	1
13C-2,3,7,8-TCDD	70		25 - 164				06/13/18 12:12	06/20/18 00:07	1
13C-OCDD	54		17 - 157				06/13/18 12:12	06/20/18 00:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	121		35 - 197				06/13/18 12:12	06/20/18 00:07	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	0.0021	B	0.0016	0.00050	ug/Kg	☼	06/13/18 12:12	06/21/18 18:06	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	70		24 - 169				06/13/18 12:12	06/21/18 18:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	104		35 - 197				06/13/18 12:12	06/21/18 18:06	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S203-D

Date Collected: 06/02/18 11:33

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-7

Matrix: Solid

Percent Solids: 30.6

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	1.8	G	0.012	0.012	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,4,6,7,8-HpCDF	0.56	G	0.011	0.011	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,4,7,8,9-HpCDF	0.030	B G	0.012	0.012	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,4,7,8-HxCDD	0.0034	J q	0.0082	0.00084	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,4,7,8-HxCDF	0.052	B	0.0082	0.0024	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,6,7,8-HxCDD	0.046		0.0082	0.00083	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,6,7,8-HxCDF	0.0096		0.0082	0.0026	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,7,8,9-HxCDD	0.0085		0.0082	0.00078	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,7,8,9-HxCDF	0.0014	J B	0.0082	0.0012	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,7,8-PeCDD	0.0021	J	0.0082	0.00042	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
1,2,3,7,8-PeCDF	0.0015	J	0.0082	0.00080	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
2,3,4,6,7,8-HxCDF	0.0042	J	0.0082	0.0018	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
2,3,4,7,8-PeCDF	0.0052	J	0.0082	0.00085	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
2,3,7,8-TCDD	0.00080	J q	0.0016	0.00013	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
OCDD	16	E	0.016	0.0058	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1
OCDF	2.9		0.016	0.00053	ug/Kg	☼	06/13/18 12:12	06/20/18 00:52	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	46		23 - 140	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,4,6,7,8-HpCDF	50		28 - 143	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,4,7,8,9-HpCDF	54		26 - 138	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,4,7,8-HxCDD	53		32 - 141	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,4,7,8-HxCDF	52		26 - 152	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,6,7,8-HxCDD	51		28 - 130	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,6,7,8-HxCDF	48		26 - 123	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,7,8,9-HxCDF	57		29 - 147	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,7,8-PeCDD	57		25 - 181	06/13/18 12:12	06/20/18 00:52	1
13C-1,2,3,7,8-PeCDF	67		24 - 185	06/13/18 12:12	06/20/18 00:52	1
13C-2,3,4,6,7,8-HxCDF	50		28 - 136	06/13/18 12:12	06/20/18 00:52	1
13C-2,3,4,7,8-PeCDF	68		21 - 178	06/13/18 12:12	06/20/18 00:52	1
13C-2,3,7,8-TCDD	62		25 - 164	06/13/18 12:12	06/20/18 00:52	1
13C-OCDD	43		17 - 157	06/13/18 12:12	06/20/18 00:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	119		35 - 197	06/13/18 12:12	06/20/18 00:52	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	0.0030	B	0.0016	0.00050	ug/Kg	☼	06/13/18 12:12	06/22/18 00:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	69		24 - 169	06/13/18 12:12	06/22/18 00:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	102		35 - 197	06/13/18 12:12	06/22/18 00:21	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S176

Date Collected: 06/02/18 13:21

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-8

Matrix: Solid

Percent Solids: 54.1

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	0.39		0.0045	0.0038	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,4,6,7,8-HpCDF	0.073		0.0045	0.00078	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,4,7,8,9-HpCDF	0.0063	B	0.0045	0.00092	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,4,7,8-HxCDD	0.0018	J	0.0045	0.00019	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,4,7,8-HxCDF	0.0059	B	0.0045	0.00046	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,6,7,8-HxCDD	0.011		0.0045	0.00018	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,6,7,8-HxCDF	0.0042	J	0.0045	0.00047	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,7,8,9-HxCDD	0.0040	J	0.0045	0.00017	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,7,8,9-HxCDF	0.0014	J B	0.0045	0.00023	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,7,8-PeCDD	ND		0.0045	0.00041	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
1,2,3,7,8-PeCDF	0.0018	J q	0.0045	0.00033	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
2,3,4,6,7,8-HxCDF	0.0018	J	0.0045	0.00032	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
2,3,4,7,8-PeCDF	0.0017	J	0.0045	0.00037	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
2,3,7,8-TCDD	0.00096		0.00091	0.000080	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
OCDD	4.3	E	0.0091	0.0011	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
OCDF	0.29		0.0091	0.000096	ug/Kg	☼	06/13/18 12:12	06/20/18 01:38	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	44		23 - 140				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,4,6,7,8-HpCDF	49		28 - 143				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,4,7,8,9-HpCDF	48		26 - 138				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,4,7,8-HxCDD	55		32 - 141				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,4,7,8-HxCDF	53		26 - 152				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,6,7,8-HxCDD	52		28 - 130				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,6,7,8-HxCDF	50		26 - 123				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,7,8,9-HxCDF	57		29 - 147				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,7,8-PeCDD	58		25 - 181				06/13/18 12:12	06/20/18 01:38	1
13C-1,2,3,7,8-PeCDF	68		24 - 185				06/13/18 12:12	06/20/18 01:38	1
13C-2,3,4,6,7,8-HxCDF	51		28 - 136				06/13/18 12:12	06/20/18 01:38	1
13C-2,3,4,7,8-PeCDF	68		21 - 178				06/13/18 12:12	06/20/18 01:38	1
13C-2,3,7,8-TCDD	62		25 - 164				06/13/18 12:12	06/20/18 01:38	1
13C-OCDD	42		17 - 157				06/13/18 12:12	06/20/18 01:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	123		35 - 197				06/13/18 12:12	06/20/18 01:38	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	0.0025	B	0.00091	0.00031	ug/Kg	☼	06/13/18 12:12	06/22/18 00:59	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	70		24 - 169				06/13/18 12:12	06/22/18 00:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	112		35 - 197				06/13/18 12:12	06/22/18 00:59	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77769-2

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

Lab Sample ID: MB 320-228869/1-A

Matrix: Solid

Analysis Batch: 229749

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 228869

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	ND		0.0050	0.000084	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,4,6,7,8-HpCDF	ND		0.0050	0.000098	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,4,7,8,9-HpCDF	0.000638	J q	0.0050	0.00014	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,4,7,8-HxCDD	ND		0.0050	0.00011	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,4,7,8-HxCDF	0.000161	J	0.0050	0.000090	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.00010	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000083	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000089	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,7,8,9-HxCDF	0.00103	J	0.0050	0.000078	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,7,8-PeCDD	ND		0.0050	0.00011	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
1,2,3,7,8-PeCDF	ND		0.0050	0.000076	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000074	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000090	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
2,3,7,8-TCDD	ND		0.0010	0.00010	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
2,3,7,8-TCDF	0.000348	J	0.0010	0.000096	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
OCDD	ND		0.010	0.00013	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
OCDF	ND		0.010	0.00021	ug/Kg		06/13/18 12:12	06/19/18 06:05	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	62		23 - 140	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,4,6,7,8-HpCDF	64		28 - 143	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,4,7,8,9-HpCDF	62		26 - 138	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,4,7,8-HxCDD	59		32 - 141	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,4,7,8-HxCDF	76		26 - 152	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,6,7,8-HxCDD	70		28 - 130	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,6,7,8-HxCDF	78		26 - 123	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,7,8,9-HxCDF	72		29 - 147	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,7,8-PeCDD	76		25 - 181	06/13/18 12:12	06/19/18 06:05	1
13C-1,2,3,7,8-PeCDF	64		24 - 185	06/13/18 12:12	06/19/18 06:05	1
13C-2,3,4,6,7,8-HxCDF	74		28 - 136	06/13/18 12:12	06/19/18 06:05	1
13C-2,3,4,7,8-PeCDF	60		21 - 178	06/13/18 12:12	06/19/18 06:05	1
13C-2,3,7,8-TCDD	68		25 - 164	06/13/18 12:12	06/19/18 06:05	1
13C-2,3,7,8-TCDF	67		24 - 169	06/13/18 12:12	06/19/18 06:05	1
13C-OCDD	63		17 - 157	06/13/18 12:12	06/19/18 06:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	97		35 - 197	06/13/18 12:12	06/19/18 06:05	1

Lab Sample ID: LCS 320-228869/2-A

Matrix: Solid

Analysis Batch: 229749

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 228869

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.112		ug/Kg		112	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.114		ug/Kg		114	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.113		ug/Kg		113	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.112		ug/Kg		112	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.113		ug/Kg		113	72 - 134

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77769-2

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

Lab Sample ID: LCS 320-228869/2-A

Matrix: Solid

Analysis Batch: 229749

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 228869

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	0.100	0.104		ug/Kg		104	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.116		ug/Kg		116	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.107		ug/Kg		107	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.110		ug/Kg		110	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0907		ug/Kg		91	70 - 142
1,2,3,7,8-PeCDF	0.100	0.118		ug/Kg		118	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	0.118		ug/Kg		118	68 - 160
2,3,7,8-TCDD	0.0200	0.0235		ug/Kg		118	67 - 158
2,3,7,8-TCDF	0.0200	0.0230		ug/Kg		115	75 - 158
OCDD	0.200	0.187		ug/Kg		94	78 - 144
OCDF	0.200	0.205		ug/Kg		102	63 - 170

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	58		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	65		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	61		20 - 186
13C-1,2,3,4,7,8-HxCDD	64		21 - 193
13C-1,2,3,4,7,8-HxCDF	76		19 - 202
13C-1,2,3,6,7,8-HxCDD	69		25 - 163
13C-1,2,3,6,7,8-HxCDF	77		21 - 159
13C-1,2,3,7,8,9-HxCDF	73		17 - 205
13C-1,2,3,7,8-PeCDD	70		21 - 227
13C-1,2,3,7,8-PeCDF	61		21 - 192
13C-2,3,4,6,7,8-HxCDF	75		22 - 176
13C-2,3,4,7,8-PeCDF	60		13 - 328
13C-2,3,7,8-TCDD	64		20 - 175
13C-2,3,7,8-TCDF	66		22 - 152
13C-OCDD	68		13 - 199

Surrogate	LCS %Recovery	LCS Qualifier	Limits
37Cl4-2,3,7,8-TCDD	99		31 - 191

Lab Sample ID: LCSD 320-228869/3-A

Matrix: Solid

Analysis Batch: 229749

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 228869

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.107		ug/Kg		107	70 - 140	5	50
1,2,3,4,6,7,8-HpCDF	0.100	0.110		ug/Kg		110	82 - 122	4	50
1,2,3,4,7,8,9-HpCDF	0.100	0.110		ug/Kg		110	78 - 138	2	50
1,2,3,4,7,8-HxCDD	0.100	0.107		ug/Kg		107	70 - 164	4	50
1,2,3,4,7,8-HxCDF	0.100	0.112		ug/Kg		112	72 - 134	2	50
1,2,3,6,7,8-HxCDD	0.100	0.103		ug/Kg		103	76 - 134	1	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	0.106		ug/Kg		106	64 - 162	1	50
1,2,3,7,8,9-HxCDF	0.100	0.114		ug/Kg		114	78 - 130	4	50
1,2,3,7,8-PeCDD	0.100	0.0882		ug/Kg		88	70 - 142	3	50

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77769-2

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

Lab Sample ID: LCSD 320-228869/3-A

Matrix: Solid

Analysis Batch: 229749

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 228869

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	0.100	0.115		ug/Kg		115	80 - 134	3	50
2,3,4,6,7,8-HxCDF	0.100	0.113		ug/Kg		113	70 - 156	3	50
2,3,4,7,8-PeCDF	0.100	0.118		ug/Kg		118	68 - 160	0	50
2,3,7,8-TCDD	0.0200	0.0237		ug/Kg		119	67 - 158	1	50
2,3,7,8-TCDF	0.0200	0.0227		ug/Kg		114	75 - 158	1	50
OCDD	0.200	0.186		ug/Kg		93	78 - 144	1	50
OCDF	0.200	0.206		ug/Kg		103	63 - 170	0	50

LCSD		LCSD	Limits
Isotope Dilution	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	62		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	68		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	64		20 - 186
13C-1,2,3,4,7,8-HxCDD	68		21 - 193
13C-1,2,3,4,7,8-HxCDF	78		19 - 202
13C-1,2,3,6,7,8-HxCDD	72		25 - 163
13C-1,2,3,6,7,8-HxCDF	76		21 - 159
13C-1,2,3,7,8,9-HxCDF	74		17 - 205
13C-1,2,3,7,8-PeCDD	76		21 - 227
13C-1,2,3,7,8-PeCDF	67		21 - 192
13C-2,3,4,6,7,8-HxCDF	78		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	70		22 - 152
13C-OCDD	71		13 - 199

LCSD		LCSD	Limits
Surrogate	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	99		31 - 191

Lab Sample ID: MB 320-229025/1-A

Matrix: Solid

Analysis Batch: 229940

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 229025

MB		MB	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
Analyte	Result	Qualifier							
1,2,3,4,6,7,8-HpCDD	0.0000946	J q	0.0050	0.000015	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,6,7,8-HpCDF	0.000140	J	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,7,8,9-HpCDF	0.000579	J	0.0050	0.000021	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,7,8-HxCDD	0.000140	J	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,7,8-HxCDF	0.000102	J	0.0050	0.000026	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,6,7,8-HxCDD	0.0000407	J	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,6,7,8-HxCDF	0.0000470	J q	0.0050	0.000024	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8,9-HxCDD	0.0000275	J q	0.0050	0.000016	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8,9-HxCDF	0.000599	J	0.0050	0.000017	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000025	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8-PeCDF	0.0000769	J q	0.0050	0.000019	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,4,6,7,8-HxCDF	0.0000312	J q	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,4,7,8-PeCDF	0.0000360	J q	0.0050	0.000021	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,7,8-TCDD	0.0000987	J q	0.0010	0.000023	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,7,8-TCDF	0.000152	J	0.0010	0.000017	ug/Kg		06/14/18 09:34	06/20/18 01:27	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77769-2

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

Lab Sample ID: MB 320-229025/1-A

Matrix: Solid

Analysis Batch: 229940

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 229025

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
OCDD	0.000338	J q	0.010	0.000016	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
OCDF	0.000280	J q	0.010	0.000024	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	64		23 - 140				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,6,7,8-HpCDF	61		28 - 143				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,7,8,9-HpCDF	64		26 - 138				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,7,8-HxCDD	72		32 - 141				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,7,8-HxCDF	72		26 - 152				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,6,7,8-HxCDD	64		28 - 130				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,6,7,8-HxCDF	65		26 - 123				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,7,8,9-HxCDF	71		29 - 147				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,7,8-PeCDD	71		25 - 181				06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,7,8-PeCDF	70		24 - 185				06/14/18 09:34	06/20/18 01:27	1
13C-2,3,4,6,7,8-HxCDF	71		28 - 136				06/14/18 09:34	06/20/18 01:27	1
13C-2,3,4,7,8-PeCDF	68		21 - 178				06/14/18 09:34	06/20/18 01:27	1
13C-2,3,7,8-TCDD	65		25 - 164				06/14/18 09:34	06/20/18 01:27	1
13C-2,3,7,8-TCDF	73		24 - 169				06/14/18 09:34	06/20/18 01:27	1
13C-OCDD	67		17 - 157				06/14/18 09:34	06/20/18 01:27	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	109		35 - 197				06/14/18 09:34	06/20/18 01:27	1

Lab Sample ID: LCS 320-229025/2-A

Matrix: Solid

Analysis Batch: 229940

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 229025

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.101		ug/Kg		101	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.104		ug/Kg		104	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.102		ug/Kg		102	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.0995		ug/Kg		99	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.100		ug/Kg		100	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.0999		ug/Kg		100	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	0.105		ug/Kg		105	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.100		ug/Kg		100	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0981		ug/Kg		98	70 - 142
1,2,3,7,8-PeCDF	0.100	0.101		ug/Kg		101	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.0996		ug/Kg		100	70 - 156
2,3,4,7,8-PeCDF	0.100	0.102		ug/Kg		102	68 - 160
2,3,7,8-TCDD	0.0200	0.0202		ug/Kg		101	67 - 158
2,3,7,8-TCDF	0.0200	0.0198		ug/Kg		99	75 - 158
OCDD	0.200	0.189		ug/Kg		94	78 - 144
OCDF	0.200	0.176		ug/Kg		88	63 - 170
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C-1,2,3,4,6,7,8-HpCDD	63		26 - 166				

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77769-2

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

Lab Sample ID: LCS 320-229025/2-A

Matrix: Solid

Analysis Batch: 229940

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 229025

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDF	59		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	61		20 - 186
13C-1,2,3,4,7,8-HxCDD	67		21 - 193
13C-1,2,3,4,7,8-HxCDF	67		19 - 202
13C-1,2,3,6,7,8-HxCDD	60		25 - 163
13C-1,2,3,6,7,8-HxCDF	60		21 - 159
13C-1,2,3,7,8,9-HxCDF	67		17 - 205
13C-1,2,3,7,8-PeCDD	64		21 - 227
13C-1,2,3,7,8-PeCDF	63		21 - 192
13C-2,3,4,6,7,8-HxCDF	66		22 - 176
13C-2,3,4,7,8-PeCDF	63		13 - 328
13C-2,3,7,8-TCDD	60		20 - 175
13C-2,3,7,8-TCDF	64		22 - 152
13C-OCDD	68		13 - 199

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

Lab Sample ID: LCSD 320-229025/3-A

Matrix: Solid

Analysis Batch: 229940

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 229025

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	0.103		ug/Kg		103	70 - 140	2	50
1,2,3,4,6,7,8-HpCDF	0.100	0.108		ug/Kg		108	82 - 122	4	50
1,2,3,4,7,8,9-HpCDF	0.100	0.103		ug/Kg		103	78 - 138	1	50
1,2,3,4,7,8-HxCDD	0.100	0.103		ug/Kg		103	70 - 164	3	50
1,2,3,4,7,8-HxCDF	0.100	0.102		ug/Kg		102	72 - 134	2	50
1,2,3,6,7,8-HxCDD	0.100	0.102		ug/Kg		102	76 - 134	3	50
1,2,3,6,7,8-HxCDF	0.100	0.104		ug/Kg		104	84 - 130	2	50
1,2,3,7,8,9-HxCDD	0.100	0.111		ug/Kg		111	64 - 162	5	50
1,2,3,7,8,9-HxCDF	0.100	0.103		ug/Kg		103	78 - 130	3	50
1,2,3,7,8-PeCDD	0.100	0.101		ug/Kg		101	70 - 142	2	50
1,2,3,7,8-PeCDF	0.100	0.106		ug/Kg		106	80 - 134	5	50
2,3,4,6,7,8-HxCDF	0.100	0.104		ug/Kg		104	70 - 156	4	50
2,3,4,7,8-PeCDF	0.100	0.108		ug/Kg		108	68 - 160	6	50
2,3,7,8-TCDD	0.0200	0.0209		ug/Kg		105	67 - 158	4	50
2,3,7,8-TCDF	0.0200	0.0200		ug/Kg		100	75 - 158	1	50
OCDD	0.200	0.198		ug/Kg		99	78 - 144	5	50
OCDF	0.200	0.183		ug/Kg		92	63 - 170	4	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	71		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	65		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	70		20 - 186
13C-1,2,3,4,7,8-HxCDD	74		21 - 193
13C-1,2,3,4,7,8-HxCDF	74		19 - 202
13C-1,2,3,6,7,8-HxCDD	63		25 - 163

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-77769-2

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

Lab Sample ID: LCSD 320-229025/3-A

Matrix: Solid

Analysis Batch: 229940

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 229025

Isotope Dilution	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C-1,2,3,6,7,8-HxCDF	67		21 - 159
13C-1,2,3,7,8,9-HxCDF	73		17 - 205
13C-1,2,3,7,8-PeCDD	71		21 - 227
13C-1,2,3,7,8-PeCDF	69		21 - 192
13C-2,3,4,6,7,8-HxCDF	72		22 - 176
13C-2,3,4,7,8-PeCDF	67		13 - 328
13C-2,3,7,8-TCDD	65		20 - 175
13C-2,3,7,8-TCDF	73		22 - 152
13C-OCDD	76		13 - 199
Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	108		31 - 191

Lab Chronicle

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S109

Date Collected: 06/01/18 11:25

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-1

Matrix: Solid

Percent Solids: 62.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/19/18 21:03	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230338	06/21/18 16:12	ALM	TAL SAC

Client Sample ID: PDI-SG-S113

Date Collected: 06/01/18 11:15

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-2

Matrix: Solid

Percent Solids: 56.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/19/18 21:49	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230338	06/21/18 16:50	ALM	TAL SAC

Client Sample ID: PDI-SG-S116

Date Collected: 06/01/18 09:55

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-3

Matrix: Solid

Percent Solids: 64.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230331	06/21/18 00:30	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229940	06/20/18 04:40	SMA	TAL SAC

Client Sample ID: PDI-SG-S116-D

Date Collected: 06/01/18 09:55

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-4

Matrix: Solid

Percent Solids: 64.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/19/18 22:35	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230338	06/21/18 17:28	ALM	TAL SAC

Client Sample ID: PDI-SG-S015

Date Collected: 06/02/18 11:45

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-5

Matrix: Solid

Percent Solids: 37.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/19/18 23:21	SMA	TAL SAC

TestAmerica Seattle

Lab Chronicle

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

TestAmerica Job ID: 580-77769-2

Client Sample ID: PDI-SG-S203

Date Collected: 06/02/18 11:32

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-6

Matrix: Solid

Percent Solids: 31.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/20/18 00:07	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230338	06/21/18 18:06	ALM	TAL SAC

Client Sample ID: PDI-SG-S203-D

Date Collected: 06/02/18 11:33

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-7

Matrix: Solid

Percent Solids: 30.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/20/18 00:52	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230455	06/22/18 00:21	KSS	TAL SAC

Client Sample ID: PDI-SG-S176

Date Collected: 06/02/18 13:21

Date Received: 06/04/18 14:25

Lab Sample ID: 580-77769-8

Matrix: Solid

Percent Solids: 54.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229932	06/20/18 01:38	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230455	06/22/18 00:59	KSS	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM

TestAmerica Job ID: 580-77769-2

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	10-31-18
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	08-31-18
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

TestAmerica Seattle

Sample Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-77769-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77769-1	PDI-SG-S109	Solid	06/01/18 11:25	06/04/18 14:25
580-77769-2	PDI-SG-S113	Solid	06/01/18 11:15	06/04/18 14:25
580-77769-3	PDI-SG-S116	Solid	06/01/18 09:55	06/04/18 14:25
580-77769-4	PDI-SG-S116-D	Solid	06/01/18 09:55	06/04/18 14:25
580-77769-5	PDI-SG-S015	Solid	06/02/18 11:45	06/04/18 14:25
580-77769-6	PDI-SG-S203	Solid	06/02/18 11:32	06/04/18 14:25
580-77769-7	PDI-SG-S203-D	Solid	06/02/18 11:33	06/04/18 14:25
580-77769-8	PDI-SG-S176	Solid	06/02/18 13:21	06/04/18 14:25

SURFACE SEDIMENT CHAIN OF CUSTODY															
Client Contact			Project Contact: Amy Dahl / Chelsea Cook			Site Contact: Jennifer Ray			COC No: 2						
AECOM			Tel: (206) 438-2261 / (206) 438-2010			Laboratory Contact: Elaine-Walker			6/4/2018						
1111 3rd Ave Suite 1600			Analysis Turnaround Time			Carrier: Courier			1 of 1 page(s)						
Seattle, WA 98101			Calendar (C) or Work Days (W)												
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 -SMA															
Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congener 168A	PCB/Fs 1613B	Grain size ASTM D7928/D6913	Total organic carbon 9060, Total solids (104C & 70C)	Archive Archive -20 C	580-77769 Chain of Custody		Sample Specific Notes:
PDI-SG-S109	6/1/2018	11:25	SS		MM	5		X	X	X	X	X			
PDI-SG-S113	6/1/2018	11:15	SS		MT	5		X	X	X	X	X			
PDI-SG-S116	6/1/2018	9:55	SS		MT	5		X	X	X	X	X			
PDI-SG-S116-D	6/1/2018	9:55	SS		MT	4		X	X	X	X	X			
PDI-SG-S015	6/2/2018	11:45	SS	MS/MSD	LS	9		X	X	X	X	X			
PDI-SG-S203	6/2/2018	11:32	SS		MM	5		X	X	X	X	X			
PDI-SG-203-D	6/2/2018	11:33	SS		MM	4		X	X	X	X	X			
PDI-SG-S176	6/2/2018	13:21	SS		MM	5		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															
SMA Study samples - log in separately from SS Study samples.															
Relinquished by: <i>[Signature]</i> Date/Time: 6/4/18 1350															
Relinquished by: <i>[Signature]</i> Date/Time: 6/4/18 1425															
Relinquished by: <i>[Signature]</i> Date/Time: 6/4/18 1425															

Revised 6/6/18

TestAmerica-Seattle		Client Contact		Project Contact: Amy Dahl / Chelsea Cook		Site Contact: Jennifer Ray		Carrier: Courier		COC No. 2	
5755-8th Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047		1111 3rd Ave Suite 1600 Seattle, WA 98101 Phone: (206) 438-2700 Fax: 1-(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling Portland, OR Project #: 60566335 Study: Surface Sediment-SMA		Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) ☒ 21 days ☐ Other		Laboratory Contact: Elaine Walker		Carrier: Courier		6/4/2018 1 of 1 page(s)	
Sample Identification		Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	580-77769 Chain of Custody			
PDI-SG-S109	6/1/2018	11:25	SS			MM	5	Sample Specific Notes:			
PDI-SG-S113	6/1/2018	11:15	SS			MT	5				
PDI-SG-S116	6/1/2018	9:55	SS			MT	5				
PDI-SG-S116-D	6/1/2018	9:55	SS			MT	4				
PDI-SG-S015	6/2/2018	11:15	SS	MS/MSD		LS	9				
PDI-SG-S203	6/2/2018	11:32	SS			MM	5				
PDI-SG-999-B-S203-D	6/2/2018	11:33	SS			MM	4				
PDI-SG-S176	6/2/2018	13:21	SS			MM	5				
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 (filtered)								Sample Disposal ☐ Return To Client ☒ Dispose By Lab ☒ Archive For 12 Months			
Special Instructions/QC Requirements & Comments: Separate reports for each lab SMA Study samples - log in separately from SS Study samples.								0-9,30			
Relinquished by: <i>[Signature]</i>		Company: GEOSyntec		Date/Time: 6/4/18 1300		Received by: <i>[Signature]</i>		Company: M.E.		Date/Time: 6/4/18 1350	
Relinquished by: <i>[Signature]</i>		Company: M.E.		Date/Time: 6/4/18 1425		Received by: <i>[Signature]</i>		Company: JAPOR		Date/Time: 6/4/18 1425	
Relinquished by: <i>[Signature]</i>		Company: JAPOR		Date/Time: 6/4/18 1700		Received by: <i>[Signature]</i>		Company: JAPOR		Date/Time: 6/5/18 0930	



Chain of Custody Record

Client Information (Sub Contract Lab)		Sampler: Walker, Elaine M		Carrier Tracking No(s):		COC No: 580-55994.1	
Client Contact: Shipping/Receiving		Phone:		State of Origin: Oregon		Page: Page 1 of 1	
Company: TestAmerica Laboratories, Inc.		E-Mail: elaine.walker@testamericainc.com		Job #: 580-77769-1		Preservation Codes:	
Address: 880 Riverside Parkway,		Due Date Requested: 6/20/2018		Analysis Requested		A - HCL M - Hexane N - None O - AsNaO2 P - Na2O4S R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (Specify)	
City: West Sacramento		TAT Requested (days):		AutoP/PH Frozen Archive Container billed @ \$0.		Total Number of Containers	
State, Zip: CA, 95605		PO #:		1613B/HRMS_Sox_P (MOD) Full List w/o Totals		2	
Phone: 916-373-5600(Tel) 916-372-1059(Fax)		WO #:		Perform MS/MSD (Yes or No)		2	
Email:		Project #:		Field Filtered Sample (Yes or No)		2	
Project Name: Portland Harbor Pre-Remedial Design		58012120		Preservation Code:		2	
Site:		SSOW#:		Sample Date		2	
Sample Identification - Client ID (Lab ID)		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=soil, B=biomass, A=air)	
PDI-SG-S109 (580-77769-1)	6/1/18	11:25 Pacific	Solid	X	X	X	2
PDI-SG-S113 (580-77769-2)	6/1/18	11:15 Pacific	Solid	X	X	X	2
PDI-SG-S116 (580-77769-3)	6/1/18	09:55 Pacific	Solid	X	X	X	2
PDI-SG-S116-D (580-77769-4)	6/1/18	09:55 Pacific	Solid	X	X	X	2
PDI-SG-S015 (580-77769-5)	6/2/18	11:45 Pacific	Solid	X	X	X	2
PDI-SG-S203 (580-77769-6)	6/2/18	11:32 Pacific	Solid	X	X	X	2
PDI-SG-S203-D (580-77769-7)	6/2/18	11:33 Pacific	Solid	X	X	X	2
PDI-SG-S176 (580-77769-8)	6/2/18	13:21 Pacific	Solid	X	X	X	2
Special Instructions/Note:							
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.							
Possible Hazard Identification							
Unconfirmed							
Deliverable Requested: I, II, III, IV, Other (specify)							
Primary Deliverable Rank: 2							
Empty Kit Relinquished by:							
Relinquished by: [Signature]							
Relinquished by: [Signature]							
Relinquished by: [Signature]							
Custody Seals Intact: [Signature]							
Custody Seal No.: [Signature]							
Cooler Temperature(s) °C and Other Remarks: 1.9 13.0							
Ver: 09/20/2016							



Client: AECOM

Job Number: 580-77769-2

Login Number: 77769

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: 580-77769-2

Login Number: 77769

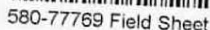
List Number: 2

Creator: Her, David A

List Source: TestAmerica Sacramento

List Creation: 06/05/18 01:59 PM

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.	N/A	
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	1.4c 3.0c
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Job: _____

Tracking # 442307504370 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.

QA-812 r1.6 05/18/2018

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77769-2

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

Matrix: Solid

Prep Type: Total/NA

		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)
Lab Sample ID	Client Sample ID								
580-77769-1	PDI-SG-S109	41	45	51	51	47	47	45	53
580-77769-1 - RA	PDI-SG-S109								
580-77769-2	PDI-SG-S113	48	53	61	49	47	59	52	57
580-77769-2 - RA	PDI-SG-S113								
580-77769-3	PDI-SG-S116	47	38	46	66	70	57	63	62
580-77769-3 - RA	PDI-SG-S116								
580-77769-4	PDI-SG-S116-D	47	52	59	49	48	58	52	56
580-77769-4 - RA	PDI-SG-S116-D								
580-77769-5	PDI-SG-S015	54	58	65	57	57	54	53	60
580-77769-6	PDI-SG-S203	56	62	66	62	62	60	57	65
580-77769-6 - RA	PDI-SG-S203								
580-77769-7	PDI-SG-S203-D	46	50	54	53	52	51	48	57
580-77769-7 - RA	PDI-SG-S203-D								
580-77769-8	PDI-SG-S176	44	49	48	55	53	52	50	57
580-77769-8 - RA	PDI-SG-S176								
MB 320-228869/1-A	Method Blank	62	64	62	59	76	70	78	72
MB 320-229025/1-A	Method Blank	64	61	64	72	72	64	65	71

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)
580-77769-1	PDI-SG-S109	56	64	46	64	57		38
580-77769-1 - RA	PDI-SG-S109						68	
580-77769-2	PDI-SG-S113	55	65	52	63	71		43
580-77769-2 - RA	PDI-SG-S113						56	
580-77769-3	PDI-SG-S116	61	61	63	60	58		51
580-77769-3 - RA	PDI-SG-S116						67	
580-77769-4	PDI-SG-S116-D	56	68	52	71	70		42
580-77769-4 - RA	PDI-SG-S116-D						67	
580-77769-5	PDI-SG-S015	59	69	54	68	64	73	52
580-77769-6	PDI-SG-S203	65	77	58	76	70		54
580-77769-6 - RA	PDI-SG-S203						70	
580-77769-7	PDI-SG-S203-D	57	67	50	68	62		43
580-77769-7 - RA	PDI-SG-S203-D						69	
580-77769-8	PDI-SG-S176	58	68	51	68	62		42
580-77769-8 - RA	PDI-SG-S176						70	
MB 320-228869/1-A	Method Blank	76	64	74	60	68	67	63
MB 320-229025/1-A	Method Blank	71	70	71	68	65	73	67

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

TestAmerica Seattle

Isotope Dilution Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-77769-2

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: 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 320-228869/2-A	Lab Control Sample	58	65	61	64	76	69	77	73
LCS 320-229025/2-A	Lab Control Sample	63	59	61	67	67	60	60	67
LCSD 320-228869/3-A	Lab Control Sample Dup	62	68	64	68	78	72	76	74
LCSD 320-229025/3-A	Lab Control Sample Dup	71	65	70	74	74	63	67	73

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 320-228869/2-A	Lab Control Sample	70	61	75	60	64	66	68
LCS 320-229025/2-A	Lab Control Sample	64	63	66	63	60	64	68
LCSD 320-228869/3-A	Lab Control Sample Dup	76	67	78	65	65	70	71
LCSD 320-229025/3-A	Lab Control Sample Dup	71	69	72	67	65	73	76

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