

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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TestAmerica Job ID: 580-79722-2

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

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Authorized for release by:
9/29/2018 4:14:31 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

TestAmerica Job ID: 580-79722-2

Job ID: 580-79722-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-79722-2

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

Four samples were received on 8/20/2018 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.8° C.

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

This report contains results for 1613B Dioxins / Furans, performed at TestAmerica Sacramento.

Samples PDI-SG-B473 (580-79722-1), PDI-SG-B467 (580-79722-2) and PDI-SG-B465 (580-79722-3) taken off hold on 9/11/2018.

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-B473 (580-79722-1), PDI-SG-B467 (580-79722-2) and PDI-SG-B465 (580-79722-3) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 09/22/2018 and 09/27/2018 and analyzed on 09/26/2018 and 09/29/2018.

1,2,3,4,7,8,9-HpCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,7,8-PeCDF and OCDD were detected in method blank MB 320-247301/1-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.

1,2,3,4,7,8,9-HpCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,7,8-PeCDF and OCDD were detected in method blank MB 320-248203/1-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 and/or 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SG-B465 (580-79722-3) and (CCV 320-247875/12). 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

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/or 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 3D5 exceeded this criteria: PDI-SG-B473 (580-79722-1), PDI-SG-B467 (580-79722-2), PDI-SG-B465 (580-79722-3), (CCV 320-248597/13), (LCS 320-248203/2-A), (LCSD 320-248203/3-A), (MB 320-248203/1-A), (WDM 320-248597/14), (MB 320-247301/1-A), (CCV 320-248106/2), (LCS 320-247301/2-A) and (LCSD 320-247301/3-A). 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.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-B473 (580-79722-1), PDI-SG-B467 (580-79722-2), and PDI-SG-B465 (580-79722-3). The reporting limits (RLs) have been adjusted proportionately.

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: 580-79722-2

Qualifiers

Dioxin

Qualifier	Qualifier Description
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.
B	Compound was found in the blank and sample.

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: 580-79722-2

Client Sample ID: PDI-SG-B473

Date Collected: 08/18/18 10:18

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79722-1

Matrix: Solid

Percent Solids: 63.3

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	0.017		0.0039	0.00024	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,4,6,7,8-HpCDF	0.0026	J q	0.0039	0.00014	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,4,7,8,9-HpCDF	0.00052	J B	0.0039	0.00016	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,4,7,8-HxCDD	0.00027	J	0.0039	0.000095	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,4,7,8-HxCDF	0.00028	J	0.0039	0.00013	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,6,7,8-HxCDD	0.00083	J	0.0039	0.000097	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,6,7,8-HxCDF	0.00015	J q	0.0039	0.00012	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,7,8,9-HxCDD	0.00073	J	0.0039	0.000089	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,7,8,9-HxCDF	0.00064	J B	0.0039	0.000098	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,7,8-PeCDD	ND		0.0039	0.00010	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
1,2,3,7,8-PeCDF	ND		0.0039	0.000076	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
2,3,4,6,7,8-HxCDF	0.00014	J	0.0039	0.000092	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
2,3,4,7,8-PeCDF	ND		0.0039	0.000080	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
2,3,7,8-TCDD	ND		0.00079	0.00012	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
2,3,7,8-TCDF	0.00033	J	0.00079	0.000088	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
OCDD	0.20	B	0.0079	0.00031	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1
OCDF	0.0083		0.0079	0.00018	ug/Kg	✱	09/27/18 14:12	09/29/18 08:24	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	54		23 - 140	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,4,6,7,8-HpCDF	46		28 - 143	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,4,7,8,9-HpCDF	58		26 - 138	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,4,7,8-HxCDD	62		32 - 141	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,4,7,8-HxCDF	57		26 - 152	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,6,7,8-HxCDD	57		28 - 130	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,6,7,8-HxCDF	59		26 - 123	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,7,8,9-HxCDF	65		29 - 147	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,7,8-PeCDD	62		25 - 181	09/27/18 14:12	09/29/18 08:24	1
13C-1,2,3,7,8-PeCDF	60		24 - 185	09/27/18 14:12	09/29/18 08:24	1
13C-2,3,4,6,7,8-HxCDF	61		28 - 136	09/27/18 14:12	09/29/18 08:24	1
13C-2,3,4,7,8-PeCDF	62		21 - 178	09/27/18 14:12	09/29/18 08:24	1
13C-2,3,7,8-TCDD	61		25 - 164	09/27/18 14:12	09/29/18 08:24	1
13C-2,3,7,8-TCDF	66		24 - 169	09/27/18 14:12	09/29/18 08:24	1
13C-OCDD	49		17 - 157	09/27/18 14:12	09/29/18 08:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	83		35 - 197	09/27/18 14:12	09/29/18 08:24	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-79722-2

Client Sample ID: PDI-SG-B467

Date Collected: 08/18/18 12:29

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79722-2

Matrix: Solid

Percent Solids: 51.7

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	0.017		0.0048	0.00039	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,4,6,7,8-HpCDF	0.0034	J q	0.0048	0.00023	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,4,7,8,9-HpCDF	0.00091	J B	0.0048	0.00031	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,4,7,8-HxCDD	0.00057	J	0.0048	0.00016	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,4,7,8-HxCDF	0.00036	J q	0.0048	0.00016	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,6,7,8-HxCDD	0.00091	J	0.0048	0.00015	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,6,7,8-HxCDF	ND		0.0048	0.00015	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,7,8,9-HxCDD	0.0011	J q	0.0048	0.00015	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,7,8,9-HxCDF	0.0010	J q B	0.0048	0.00014	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,7,8-PeCDD	ND		0.0048	0.00015	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
1,2,3,7,8-PeCDF	0.00025	J B	0.0048	0.00010	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
2,3,4,6,7,8-HxCDF	0.00022	J q	0.0048	0.00014	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
2,3,4,7,8-PeCDF	0.00013	J	0.0048	0.00011	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
2,3,7,8-TCDD	ND		0.00096	0.00022	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
2,3,7,8-TCDF	0.00026	J	0.00096	0.00013	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
OCDD	0.16	B	0.0096	0.00053	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1
OCDF	0.011		0.0096	0.00035	ug/Kg	✱	09/22/18 13:34	09/26/18 21:46	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	64		23 - 140	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,4,6,7,8-HpCDF	54		28 - 143	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,4,7,8,9-HpCDF	63		26 - 138	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,4,7,8-HxCDD	63		32 - 141	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,4,7,8-HxCDF	63		26 - 152	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,6,7,8-HxCDD	62		28 - 130	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,6,7,8-HxCDF	63		26 - 123	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,7,8,9-HxCDF	67		29 - 147	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,7,8-PeCDD	67		25 - 181	09/22/18 13:34	09/26/18 21:46	1
13C-1,2,3,7,8-PeCDF	61		24 - 185	09/22/18 13:34	09/26/18 21:46	1
13C-2,3,4,6,7,8-HxCDF	60		28 - 136	09/22/18 13:34	09/26/18 21:46	1
13C-2,3,4,7,8-PeCDF	62		21 - 178	09/22/18 13:34	09/26/18 21:46	1
13C-2,3,7,8-TCDD	63		25 - 164	09/22/18 13:34	09/26/18 21:46	1
13C-2,3,7,8-TCDF	57		24 - 169	09/22/18 13:34	09/26/18 21:46	1
13C-OCDD	58		17 - 157	09/22/18 13:34	09/26/18 21:46	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	87		35 - 197	09/22/18 13:34	09/26/18 21:46	1

TestAmerica Seattle

Client Sample Results

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

TestAmerica Job ID: 580-79722-2

Client Sample ID: PDI-SG-B465

Date Collected: 08/18/18 13:40

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79722-3

Matrix: Solid

Percent Solids: 66.1

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	0.011		0.0037	0.00023	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,4,6,7,8-HpCDF	0.0023	J q	0.0037	0.00016	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,4,7,8,9-HpCDF	0.00057	J B	0.0037	0.00018	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,4,7,8-HxCDD	0.00027	J	0.0037	0.00017	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.00016	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,6,7,8-HxCDD	0.00062	J	0.0037	0.00016	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.00014	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,7,8,9-HxCDD	0.00040	J	0.0037	0.00015	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,7,8,9-HxCDF	0.00074	J B	0.0037	0.00012	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,7,8-PeCDD	ND		0.0037	0.00021	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
1,2,3,7,8-PeCDF	ND		0.0037	0.00013	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.00012	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
2,3,4,7,8-PeCDF	ND		0.0037	0.00014	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
2,3,7,8-TCDD	ND		0.00075	0.00011	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
2,3,7,8-TCDF	0.00017	J	0.00075	0.00010	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
OCDD	0.093	B	0.0075	0.00029	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1
OCDF	0.0069	J	0.0075	0.00022	ug/Kg	✱	09/27/18 14:12	09/29/18 09:13	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	50		23 - 140	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,4,6,7,8-HpCDF	42		28 - 143	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,4,7,8,9-HpCDF	55		26 - 138	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,4,7,8-HxCDD	64		32 - 141	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,4,7,8-HxCDF	61		26 - 152	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,6,7,8-HxCDD	59		28 - 130	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,6,7,8-HxCDF	61		26 - 123	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,7,8,9-HxCDF	66		29 - 147	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,7,8-PeCDD	81		25 - 181	09/27/18 14:12	09/29/18 09:13	1
13C-1,2,3,7,8-PeCDF	79		24 - 185	09/27/18 14:12	09/29/18 09:13	1
13C-2,3,4,6,7,8-HxCDF	61		28 - 136	09/27/18 14:12	09/29/18 09:13	1
13C-2,3,4,7,8-PeCDF	81		21 - 178	09/27/18 14:12	09/29/18 09:13	1
13C-2,3,7,8-TCDD	68		25 - 164	09/27/18 14:12	09/29/18 09:13	1
13C-2,3,7,8-TCDF	72		24 - 169	09/27/18 14:12	09/29/18 09:13	1
13C-OCDD	43		17 - 157	09/27/18 14:12	09/29/18 09:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	93		35 - 197	09/27/18 14:12	09/29/18 09:13	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-79722-2

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

Lab Sample ID: MB 320-247301/1-A

Matrix: Solid

Analysis Batch: 248106

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 247301

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	ND		0.0050	0.00021	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,4,6,7,8-HpCDF	ND		0.0050	0.00014	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,4,7,8,9-HpCDF	0.000705	J	0.0050	0.00020	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,4,7,8-HxCDD	ND		0.0050	0.00016	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.00016	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.00015	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.00014	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.00014	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,7,8,9-HxCDF	0.00113	J	0.0050	0.00013	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,7,8-PeCDD	ND		0.0050	0.00016	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
1,2,3,7,8-PeCDF	0.000413	J q	0.0050	0.00011	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.00022	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
2,3,4,7,8-PeCDF	ND		0.0050	0.00013	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
2,3,7,8-TCDD	ND		0.0010	0.00023	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
2,3,7,8-TCDF	ND		0.0010	0.00017	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
OCDD	0.000552	J	0.010	0.00042	ug/Kg		09/22/18 13:34	09/26/18 19:21	1
OCDF	ND		0.010	0.00039	ug/Kg		09/22/18 13:34	09/26/18 19:21	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	79		23 - 140	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,4,6,7,8-HpCDF	74		28 - 143	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,4,7,8,9-HpCDF	78		26 - 138	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,4,7,8-HxCDD	68		32 - 141	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,4,7,8-HxCDF	67		26 - 152	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,6,7,8-HxCDD	70		28 - 130	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,6,7,8-HxCDF	75		26 - 123	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,7,8,9-HxCDF	78		29 - 147	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,7,8-PeCDD	66		25 - 181	09/22/18 13:34	09/26/18 19:21	1
13C-1,2,3,7,8-PeCDF	63		24 - 185	09/22/18 13:34	09/26/18 19:21	1
13C-2,3,4,6,7,8-HxCDF	75		28 - 136	09/22/18 13:34	09/26/18 19:21	1
13C-2,3,4,7,8-PeCDF	59		21 - 178	09/22/18 13:34	09/26/18 19:21	1
13C-2,3,7,8-TCDD	71		25 - 164	09/22/18 13:34	09/26/18 19:21	1
13C-2,3,7,8-TCDF	66		24 - 169	09/22/18 13:34	09/26/18 19:21	1
13C-OCDD	72		17 - 157	09/22/18 13:34	09/26/18 19:21	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	83		35 - 197	09/22/18 13:34	09/26/18 19:21	1

Lab Sample ID: LCS 320-247301/2-A

Matrix: Solid

Analysis Batch: 248106

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 247301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.104		ug/Kg		104	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.103		ug/Kg		103	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.107		ug/Kg		107	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.108		ug/Kg		108	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.114		ug/Kg		114	72 - 134

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-79722-2

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

Lab Sample ID: LCS 320-247301/2-A

Matrix: Solid

Analysis Batch: 248106

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 247301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	0.100	0.111		ug/Kg		111	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.112		ug/Kg		112	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.110		ug/Kg		110	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.108		ug/Kg		108	78 - 130
1,2,3,7,8-PeCDD	0.100	0.108		ug/Kg		108	70 - 142
1,2,3,7,8-PeCDF	0.100	0.107		ug/Kg		107	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.110		ug/Kg		110	70 - 156
2,3,4,7,8-PeCDF	0.100	0.106		ug/Kg		106	68 - 160
2,3,7,8-TCDD	0.0200	0.0201		ug/Kg		100	67 - 158
2,3,7,8-TCDF	0.0200	0.0204		ug/Kg		102	75 - 158
OCDD	0.200	0.227		ug/Kg		113	78 - 144
OCDF	0.200	0.234		ug/Kg		117	63 - 170

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	65		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	62		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	63		20 - 186
13C-1,2,3,4,7,8-HxCDD	67		21 - 193
13C-1,2,3,4,7,8-HxCDF	61		19 - 202
13C-1,2,3,6,7,8-HxCDD	60		25 - 163
13C-1,2,3,6,7,8-HxCDF	64		21 - 159
13C-1,2,3,7,8,9-HxCDF	68		17 - 205
13C-1,2,3,7,8-PeCDD	67		21 - 227
13C-1,2,3,7,8-PeCDF	66		21 - 192
13C-2,3,4,6,7,8-HxCDF	63		22 - 176
13C-2,3,4,7,8-PeCDF	66		13 - 328
13C-2,3,7,8-TCDD	60		20 - 175
13C-2,3,7,8-TCDF	59		22 - 152
13C-OCDD	59		13 - 199

Surrogate	LCS %Recovery	LCS Qualifier	Limits
37Cl4-2,3,7,8-TCDD	86		31 - 191

Lab Sample ID: LCSD 320-247301/3-A

Matrix: Solid

Analysis Batch: 248106

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 247301

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.110		ug/Kg		110	70 - 140	6	50
1,2,3,4,6,7,8-HpCDF	0.100	0.107		ug/Kg		107	82 - 122	4	50
1,2,3,4,7,8,9-HpCDF	0.100	0.112		ug/Kg		112	78 - 138	4	50
1,2,3,4,7,8-HxCDD	0.100	0.109		ug/Kg		109	70 - 164	1	50
1,2,3,4,7,8-HxCDF	0.100	0.113		ug/Kg		113	72 - 134	1	50
1,2,3,6,7,8-HxCDD	0.100	0.112		ug/Kg		112	76 - 134	1	50
1,2,3,6,7,8-HxCDF	0.100	0.113		ug/Kg		113	84 - 130	1	50
1,2,3,7,8,9-HxCDD	0.100	0.112		ug/Kg		112	64 - 162	2	50
1,2,3,7,8,9-HxCDF	0.100	0.116		ug/Kg		116	78 - 130	8	50
1,2,3,7,8-PeCDD	0.100	0.113		ug/Kg		113	70 - 142	4	50

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-79722-2

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

Lab Sample ID: LCSD 320-247301/3-A

Matrix: Solid

Analysis Batch: 248106

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 247301

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	0.100	0.113		ug/Kg		113	80 - 134	6	50
2,3,4,6,7,8-HxCDF	0.100	0.114		ug/Kg		114	70 - 156	4	50
2,3,4,7,8-PeCDF	0.100	0.108		ug/Kg		108	68 - 160	1	50
2,3,7,8-TCDD	0.0200	0.0214		ug/Kg		107	67 - 158	7	50
2,3,7,8-TCDF	0.0200	0.0207		ug/Kg		104	75 - 158	2	50
OCDD	0.200	0.236		ug/Kg		118	78 - 144	4	50
OCDF	0.200	0.247		ug/Kg		124	63 - 170	5	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	70		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	67		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	71		20 - 186
13C-1,2,3,4,7,8-HxCDD	80		21 - 193
13C-1,2,3,4,7,8-HxCDF	77		19 - 202
13C-1,2,3,6,7,8-HxCDD	70		25 - 163
13C-1,2,3,6,7,8-HxCDF	77		21 - 159
13C-1,2,3,7,8,9-HxCDF	78		17 - 205
13C-1,2,3,7,8-PeCDD	79		21 - 227
13C-1,2,3,7,8-PeCDF	77		21 - 192
13C-2,3,4,6,7,8-HxCDF	77		22 - 176
13C-2,3,4,7,8-PeCDF	78		13 - 328
13C-2,3,7,8-TCDD	72		20 - 175
13C-2,3,7,8-TCDF	69		22 - 152
13C-OCDD	67		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl/4-2,3,7,8-TCDD	84		31 - 191

Lab Sample ID: MB 320-248203/1-A

Matrix: Solid

Analysis Batch: 248597

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 248203

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	ND		0.0050	0.00011	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,4,6,7,8-HpCDF	ND		0.0050	0.000080	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,4,7,8,9-HpCDF	0.000750	J	0.0050	0.00011	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,4,7,8-HxCDD	ND		0.0050	0.00013	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.00018	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,6,7,8-HxCDD	ND		0.0050	0.00012	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.00015	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,7,8,9-HxCDD	ND		0.0050	0.00012	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,7,8,9-HxCDF	0.00107	J	0.0050	0.00013	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,7,8-PeCDD	ND		0.0050	0.00012	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
1,2,3,7,8-PeCDF	0.000202	J	0.0050	0.000093	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
2,3,4,6,7,8-HxCDF	ND		0.0050	0.00012	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
2,3,4,7,8-PeCDF	ND		0.0050	0.00011	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
2,3,7,8-TCDD	ND		0.0010	0.00017	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
2,3,7,8-TCDF	ND		0.0010	0.00011	ug/Kg		09/27/18 14:12	09/29/18 03:35	1

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-79722-2

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

Lab Sample ID: MB 320-248203/1-A

Matrix: Solid

Analysis Batch: 248597

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 248203

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
OCDD	0.00144	J	0.010	0.00013	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
OCDF	ND		0.010	0.00016	ug/Kg		09/27/18 14:12	09/29/18 03:35	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	64		23 - 140				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,4,6,7,8-HpCDF	60		28 - 143				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,4,7,8,9-HpCDF	66		26 - 138				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,4,7,8-HxCDD	59		32 - 141				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,4,7,8-HxCDF	53		26 - 152				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,6,7,8-HxCDD	60		28 - 130				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,6,7,8-HxCDF	60		26 - 123				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,7,8,9-HxCDF	69		29 - 147				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,7,8-PeCDD	63		25 - 181				09/27/18 14:12	09/29/18 03:35	1
13C-1,2,3,7,8-PeCDF	61		24 - 185				09/27/18 14:12	09/29/18 03:35	1
13C-2,3,4,6,7,8-HxCDF	65		28 - 136				09/27/18 14:12	09/29/18 03:35	1
13C-2,3,4,7,8-PeCDF	57		21 - 178				09/27/18 14:12	09/29/18 03:35	1
13C-2,3,7,8-TCDD	58		25 - 164				09/27/18 14:12	09/29/18 03:35	1
13C-2,3,7,8-TCDF	60		24 - 169				09/27/18 14:12	09/29/18 03:35	1
13C-OCDD	63		17 - 157				09/27/18 14:12	09/29/18 03:35	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	80		35 - 197				09/27/18 14:12	09/29/18 03:35	1

Lab Sample ID: LCS 320-248203/2-A

Matrix: Solid

Analysis Batch: 248597

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 248203

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.105		ug/Kg		105	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	0.107		ug/Kg		107	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.102		ug/Kg		102	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.107		ug/Kg		107	72 - 134
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	0.108		ug/Kg		108	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	0.115		ug/Kg		115	78 - 130
1,2,3,7,8-PeCDD	0.100	0.104		ug/Kg		104	70 - 142
1,2,3,7,8-PeCDF	0.100	0.106		ug/Kg		106	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.108		ug/Kg		108	70 - 156
2,3,4,7,8-PeCDF	0.100	0.104		ug/Kg		104	68 - 160
2,3,7,8-TCDD	0.0200	0.0213		ug/Kg		106	67 - 158
2,3,7,8-TCDF	0.0200	0.0211		ug/Kg		105	75 - 158
OCDD	0.200	0.210		ug/Kg		105	78 - 144
OCDF	0.200	0.214		ug/Kg		107	63 - 170
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C-1,2,3,4,6,7,8-HpCDD	69		26 - 166				

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-79722-2

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

Lab Sample ID: LCS 320-248203/2-A

Matrix: Solid

Analysis Batch: 248597

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 248203

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>LCS Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,6,7,8-HpCDF	70		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	71		20 - 186
13C-1,2,3,4,7,8-HxCDD	69		21 - 193
13C-1,2,3,4,7,8-HxCDF	70		19 - 202
13C-1,2,3,6,7,8-HxCDD	72		25 - 163
13C-1,2,3,6,7,8-HxCDF	72		21 - 159
13C-1,2,3,7,8,9-HxCDF	74		17 - 205
13C-1,2,3,7,8-PeCDD	75		21 - 227
13C-1,2,3,7,8-PeCDF	75		21 - 192
13C-2,3,4,6,7,8-HxCDF	73		22 - 176
13C-2,3,4,7,8-PeCDF	75		13 - 328
13C-2,3,7,8-TCDD	72		20 - 175
13C-2,3,7,8-TCDF	73		22 - 152
13C-OCDD	69		13 - 199

<i>Surrogate</i>	<i>%Recovery</i>	<i>LCS Qualifier</i>	<i>Limits</i>
37Cl4-2,3,7,8-TCDD	81		31 - 191

Lab Sample ID: LCSD 320-248203/3-A

Matrix: Solid

Analysis Batch: 248597

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 248203

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
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	0.0997		ug/Kg		100	82 - 122	4	50
1,2,3,4,7,8,9-HpCDF	0.100	0.102		ug/Kg		102	78 - 138	5	50
1,2,3,4,7,8-HxCDD	0.100	0.101		ug/Kg		101	70 - 164	2	50
1,2,3,4,7,8-HxCDF	0.100	0.105		ug/Kg		105	72 - 134	2	50
1,2,3,6,7,8-HxCDD	0.100	0.0998		ug/Kg		100	76 - 134	4	50
1,2,3,6,7,8-HxCDF	0.100	0.106		ug/Kg		106	84 - 130	1	50
1,2,3,7,8,9-HxCDD	0.100	0.102		ug/Kg		102	64 - 162	4	50
1,2,3,7,8,9-HxCDF	0.100	0.110		ug/Kg		110	78 - 130	4	50
1,2,3,7,8-PeCDD	0.100	0.101		ug/Kg		101	70 - 142	3	50
1,2,3,7,8-PeCDF	0.100	0.104		ug/Kg		104	80 - 134	2	50
2,3,4,6,7,8-HxCDF	0.100	0.112		ug/Kg		112	70 - 156	4	50
2,3,4,7,8-PeCDF	0.100	0.102		ug/Kg		102	68 - 160	3	50
2,3,7,8-TCDD	0.0200	0.0200		ug/Kg		100	67 - 158	6	50
2,3,7,8-TCDF	0.0200	0.0207		ug/Kg		103	75 - 158	2	50
OCDD	0.200	0.207		ug/Kg		104	78 - 144	2	50
OCDF	0.200	0.211		ug/Kg		105	63 - 170	2	50

<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>LCSD Qualifier</i>	<i>Limits</i>
13C-1,2,3,4,6,7,8-HpCDD	71		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	73		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	78		20 - 186
13C-1,2,3,4,7,8-HxCDD	72		21 - 193
13C-1,2,3,4,7,8-HxCDF	76		19 - 202
13C-1,2,3,6,7,8-HxCDD	72		25 - 163

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-79722-2

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

Lab Sample ID: LCSD 320-248203/3-A

Matrix: Solid

Analysis Batch: 248597

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 248203

Isotope Dilution	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C-1,2,3,6,7,8-HxCDF	74		21 - 159
13C-1,2,3,7,8,9-HxCDF	77		17 - 205
13C-1,2,3,7,8-PeCDD	83		21 - 227
13C-1,2,3,7,8-PeCDF	81		21 - 192
13C-2,3,4,6,7,8-HxCDF	73		22 - 176
13C-2,3,4,7,8-PeCDF	82		13 - 328
13C-2,3,7,8-TCDD	75		20 - 175
13C-2,3,7,8-TCDF	71		22 - 152
13C-OCDD	73		13 - 199
Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	82		31 - 191

Lab Chronicle

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

TestAmerica Job ID: 580-79722-2

Client Sample ID: PDI-SG-B473

Date Collected: 08/18/18 10:18

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79722-1

Matrix: Solid

Percent Solids: 63.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			248203	09/27/18 14:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	248597	09/29/18 08:24	KSS	TAL SAC

Client Sample ID: PDI-SG-B467

Date Collected: 08/18/18 12:29

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79722-2

Matrix: Solid

Percent Solids: 51.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			247301	09/22/18 13:34	SR1	TAL SAC
Total/NA	Analysis	1613B		1	248106	09/26/18 21:46	AS	TAL SAC

Client Sample ID: PDI-SG-B465

Date Collected: 08/18/18 13:40

Date Received: 08/20/18 15:10

Lab Sample ID: 580-79722-3

Matrix: Solid

Percent Solids: 66.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			248203	09/27/18 14:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	248597	09/29/18 09:13	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: 580-79722-2

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
Nevada	State Program	9	WA000502019-1	07-31-19
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
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	08-11-19
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	07-31-19
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	07-31-19
USDA	Federal		P330-18-00239	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: 580-79722-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79722-1	PDI-SG-B473	Solid	08/18/18 10:18	08/20/18 15:10
580-79722-2	PDI-SG-B467	Solid	08/18/18 12:29	08/20/18 15:10
580-79722-3	PDI-SG-B465	Solid	08/18/18 13:40	08/20/18 15:10

TestAmerica-Seattle
5755-8th-Street-East
Tacoma, WA 98424-1317
Phone: 252.932.2310 Fax: 252.932.5047

Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) ☐ 21 days ☒ Other ASAP		Project Contact: Jennifer Ray Laboratory Contact: Elaine Walker		Site Contact: Jennifer Ray Laboratory Contact: Elaine Walker		Carrier: Courier COC No: 1 of 1 pages	
Client Contact AECOM 11111 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 Sample Type: D/U		Sample Date 8/18/2018 8/18/2018 8/18/2018 8/18/2018		Sample Time 10:18 12:29 13:40 15:48		Matrix SS SS SS SS	
QC Sample MT MT MT MT		Sampler's Initials MT MT MT MT		Total No. of Cont. 8 8 8 8		Fraction PCB Congeners 1668A PCBs 1613B TPH Diesel, Metals, Mercury NVTPh-DX 6020B, 7471A Grain size ASTM D7928/D6913 Total organic carbon, Total solids 9060 (104C & 70C) Archive Archive -20 C PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LI, Kron/Unger Aalterberg	
Sample Identification PDI-SG-B473 PDI-SG-B467 PDI-SG-B465 PDI-SG-B431		Sample Date 8/18/2018 8/18/2018 8/18/2018 8/18/2018		Sample Time 10:18 12:29 13:40 15:48		Matrix SS SS SS SS	
QC Sample MT MT MT MT		Sampler's Initials MT MT MT MT		Total No. of Cont. 8 8 8 8		Fraction PCB Congeners 1668A PCBs 1613B TPH Diesel, Metals, Mercury NVTPh-DX 6020B, 7471A Grain size ASTM D7928/D6913 Total organic carbon, Total solids 9060 (104C & 70C) Archive Archive -20 C PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LI, Kron/Unger Aalterberg	
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		Sample Disposal ☐ Return To Client ☒ Disposal By Lab		Sample Disposal ☐ Return To Client ☒ Disposal By Lab	
Special Instructions/QC Requirements & Comments: Analyze samples for grain size ASAP. Hold (H) remaining analyses pending further instruction. Separate reports for each lab.		Special Instructions/QC Requirements & Comments: Analyze samples for grain size ASAP. Hold (H) remaining analyses pending further instruction. Separate reports for each lab.		Special Instructions/QC Requirements & Comments: Analyze samples for grain size ASAP. Hold (H) remaining analyses pending further instruction. Separate reports for each lab.		Special Instructions/QC Requirements & Comments: Analyze samples for grain size ASAP. Hold (H) remaining analyses pending further instruction. Separate reports for each lab.	
Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]		Date/Time: 8/20/18 1430 Date/Time: 8/20/18 1510 Date/Time: 8/20/18 1510		Date/Time: 8/20/18 1430 Date/Time: 8/20/18 1510 Date/Time: 8/20/18 1510		Date/Time: 8/20/18 1430 Date/Time: 8/20/18 1510 Date/Time: 8/20/18 1510	

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THE LEADER IN ENVIRONMENTAL TESTING



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Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

[illegible]

Sacramento
Sample Receiving Notes

Job: _____
Tracking # 4506 9893 0379
SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier /
Drop Off / GSO / OnTrac / Goldstreak / USPS / 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: COC on cooler to dry. M/W 9/20/18
NOT NEEDED
Sample # 3C was received w/ cracked lid. M/W 9/20/18
Broken. Sample was transferred to new jar. M/W 9/20/18
Sample 79722 JE was ~~recd~~ received
Broken but sample was lost while trans-fering to new jar. M/W 9/20/18

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other (+0.7°C)
Ice _____ Wet _____ Gel _____ Other _____
Cooler Custody Seal: 478802
Sample Custody Seal: _____
Cooler ID: _____
Temp: Observed 3.1 Corrected 3.1
From: Temp Blank ☐ Sample ☒
NCM Filled: 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? ☐
Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Initials: MLG Date: 9/20/18

F81B

Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)				Sampler: Walker, Elaine M Phone: elaine.walker@testamericainc.com E-Mail: elaine.walker@testamericainc.com		Carrier Tracking No(s): State of Origin: Oregon		COC No: 580-59460.1 Page: Page 1 of 1 Job #: 580-79722-2			
Company: TestAmerica Laboratories, Inc. Address: 8880 Riverside Parkway, City: West Sacramento State, Zip: CA, 95605 Phone: 916-373-5600(Tel) 916-372-1059(Fax) Email:				Due Date Requested: 9/27/2018 TAT Requested (days):		Analysis Requested					
Project #: 58012120 SOW#:				PO #: 916-373-5600(Tel) 916-372-1059(Fax) WO #:		Field Filtered Sample (Yes or No) ☒ X Perform MS/MSD (Yes or No) ☒ X 1613B/HRMS_Sox_P (MOD) Full List w/o Totals ☒ X		Total Number of Containers: 1		Special Instructions/Note: Must freeze upon arrival. Out of freeze 15H (FV 9h/18)	
Sample Identification - Client ID				Sample Identification - Client ID		Sample Identification - Client ID		Sample Identification - Client ID		Sample Identification - Client ID	
PDI-SG-B467				Sample Date: 8/18/18 Sample Time: 12:29 Pacific		Sample Type (C=comp, G=grab): Solid		Matrix (W=water, S=solid, O=other, BT=Tissue, AA=As): Solid		Preservation Code:	
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.				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months		Special Instructions/QC Requirements:		Method of Shipment:		Date/Time: 9/21/18 15:45 Date/Time: 9/21/18 15:45 Date/Time: 9/21/18 15:45	
Possible Hazard Identification				Possible Hazard Identification		Possible Hazard Identification		Possible Hazard Identification		Possible Hazard Identification	
Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)				Primary Deliverable Rank: 2		Date: 9/21/18 15:45		Date: 9/21/18 15:45		Date: 9/21/18 15:45	
Empty Kit Relinquished by:				Relinquished by: Khal		Relinquished by: Khal		Relinquished by: Khal		Relinquished by: Khal	
Relinquished by:				Relinquished by:		Relinquished by:		Relinquished by:		Relinquished by:	
Relinquished by:				Relinquished by:		Relinquished by:		Relinquished by:		Relinquished by:	
Custody Seal Intact: A Yes A No				Custody Seal No.:		Custody Seal No.:		Custody Seal No.:		Custody Seal No.:	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79722-2

Login Number: 79722

List Source: TestAmerica Seattle

List Number: 1

Creator: Antonson, Angeline D

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.	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	

Client: AECOM

Job Number: 580-79722-2

Login Number: 79722

List Number: 2

Creator: Gooch, Mayce

List Source: TestAmerica Sacramento

List Creation: 08/22/18 08:53 AM

Question	Answer	Comment
Radioactivity wasn't checked or is <= 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	0.7c 4.2c
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 <6mm (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

Sacramento Sample Receiving Notes



580-79722 Field Sheet

Job: _____

Tracking # 4423 0750 9630 SO / FO / FO / 2-Day / Ground / UPS / Courier / GSO /
OnTrac / Goldstreak / USPS / 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: Sample #53D
NOT NEEDED. MIG 8/22/18

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other _____
(+0.7°C)

Ice Y Wet Y Gel _____ Other _____

Cooler Custody Seal: Seal

Sample Custody Seal: _____

Cooler ID: 2 of 2

Temp: Observed 0.7 Corrected 0.7

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: MJ Date: 8/22/18

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

F81A@910





Job: _____ 580-79722 Field Sheet

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

Therm. ID: AK-2 / AK-3 / AK-5 / AK-6 / HACCP / Other _____
(+0.7°C)

Ice ☒ Wet ☒ Gel _____ Other _____

Cooler Custody Seal: 47 8850

Sample Custody Seal: _____

Cooler ID: _____

Temp: Observed 5.9 Corrected 5.9

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: AS Date: 9-22-18

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

Isotope Dilution Summary

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

TestAmerica Job ID: 580-79722-2

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 (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-79722-1	PDI-SG-B473	54	46	58	62	57	57	59	65
580-79722-2	PDI-SG-B467	64	54	63	63	63	62	63	67
580-79722-3	PDI-SG-B465	50	42	55	64	61	59	61	66
MB 320-247301/1-A	Method Blank	79	74	78	68	67	70	75	78
MB 320-248203/1-A	Method Blank	64	60	66	59	53	60	60	69

		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)
580-79722-1	PDI-SG-B473	62	60	61	62	61	66	49
580-79722-2	PDI-SG-B467	67	61	60	62	63	57	58
580-79722-3	PDI-SG-B465	81	79	61	81	68	72	43
MB 320-247301/1-A	Method Blank	66	63	75	59	71	66	72
MB 320-248203/1-A	Method Blank	63	61	65	57	58	60	63

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: 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 320-247301/2-A	Lab Control Sample	65	62	63	67	61	60	64	68
LCS 320-248203/2-A	Lab Control Sample	69	70	71	69	70	72	72	74
LCSD 320-247301/3-A	Lab Control Sample Dup	70	67	71	80	77	70	77	78
LCSD 320-248203/3-A	Lab Control Sample Dup	71	73	78	72	76	72	74	77

		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 320-247301/2-A	Lab Control Sample	67	66	63	66	60	59	59
LCS 320-248203/2-A	Lab Control Sample	75	75	73	75	72	73	69
LCSD 320-247301/3-A	Lab Control Sample Dup	79	77	77	78	72	69	67
LCSD 320-248203/3-A	Lab Control Sample Dup	83	81	73	82	75	71	73

TestAmerica Seattle

Isotope Dilution Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79722-2

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

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