TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-79019-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Authorized for release by:
8/3/2018 3:31:10 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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Job ID: 580-79019-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-79019-2

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

Six samples were received on 7/20/2018 1:17 PM; the samples arrived in good condition, properly preserved and, where required, on ice.

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-SC-S033-0to2 (580-79019-1), PDI-SC-S033-2to3 (580-79019-2), PDI-SC-S033-3to4 (580-79019-3), PDI-SC-S034-4to5.2 (580-79019-4), PDI-SC-S034-0to1.8 (580-79019-5) and PDI-SC-S034-1.8to4 (580-79019-6) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 07/25/2018 and analyzed on 07/30/2018, 07/31/2018 and 08/01/2018.

Several analytes were detected in method blank MB 320-236121/1-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. Refer to the QC report for details.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: PDI-SC-S033-0to2 (580-79019-1), PDI-SC-S033-2to3 (580-79019-2) and PDI-SC-S033-3to4 (580-79019-3). These analytes have been qualified; however, the peak(s) 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 Isotope Dilution Analyte (IDA) 13C-1,2,3,4,6,7,8-HpCDF recovery associated with the following sample is below the method recommended limit: PDI-SC-S034-4to5.2 (580-79019-4). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample. All detection limits are below the lower calibration.

Isotope Dilution Analyte (IDA) 13C-1,2,3,6,7,8-HxCDF recovery is above the method recommended limit for the following sample: PDI-SC-S033-2to3 (580-79019-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Job ID: 580-79019-2 (Continued)

Laboratory: TestAmerica Seattle (Continued)

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: PDI-SC-S033-0to2 (580-79019-1), PDI-SC-S033-2to3 (580-79019-2), PDI-SC-S033-3to4 (580-79019-3), PDI-SC-S034-0to1.8 (580-79019-5) and (CCV 320-237440/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SC-S033-0to2 (580-79019-1), PDI-SC-S033-2to3 (580-79019-2), PDI-SC-S033-3to4 (580-79019-3), PDI-SC-S034-4to5.2 (580-79019-4), PDI-SC-S034-0to1.8 (580-79019-5) and PDI-SC-S034-1.8to4 (580-79019-6). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-236121.

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: 580-79019-2

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.
E	Result exceeded calibration range.
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.
*	Isotope Dilution analyte is outside acceptance limits.

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 ID: PDI-SC-S033-0to2
Date Collected: 07/18/18 17:40
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-1
Matrix: Solid
Percent Solids: 44.5

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	0.78	B	0.0056	0.0019	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,4,6,7,8-HpCDF	0.14	B	0.0056	0.0010	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,4,7,8,9-HpCDF	0.0083	B	0.0056	0.0018	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,4,7,8-HxCDD	0.0055	J B	0.0056	0.00031	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,4,7,8-HxCDF	0.012		0.0056	0.0014	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,6,7,8-HxCDD	0.024	B	0.0056	0.00029	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,6,7,8-HxCDF	0.0068	B	0.0056	0.0012	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,7,8,9-HxCDD	0.0095	B	0.0056	0.00027	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,7,8,9-HxCDF	0.0014	J B	0.0056	0.00084	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,7,8-PeCDD	0.0027	J B	0.0056	0.00059	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
1,2,3,7,8-PeCDF	0.0034	J B	0.0056	0.00059	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
2,3,4,6,7,8-HxCDF	0.0047	J B	0.0056	0.00093	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
2,3,4,7,8-PeCDF	0.0055	J	0.0056	0.00063	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
2,3,7,8-TCDD	0.00085	J	0.0011	0.00014	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
OCDD	8.6	E B	0.011	0.0018	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1
OCDF	0.43	B	0.011	0.00027	ug/Kg	☼	07/25/18 14:47	07/31/18 05:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*50*		*23 - 140*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*46*		*28 - 143*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*36*		*26 - 138*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,4,7,8-HxCDD	*77*		*32 - 141*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,4,7,8-HxCDF	*111*		*26 - 152*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,6,7,8-HxCDD	*72*		*28 - 130*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,6,7,8-HxCDF	*107*		*26 - 123*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,7,8,9-HxCDF	*70*		*29 - 147*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,7,8-PeCDD	*78*		*25 - 181*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-1,2,3,7,8-PeCDF	*77*		*24 - 185*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-2,3,4,6,7,8-HxCDF	*81*		*28 - 136*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-2,3,4,7,8-PeCDF	*72*		*21 - 178*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-2,3,7,8-TCDD	*68*		*25 - 164*	*07/25/18 14:47*	*07/31/18 05:43*	*1*
13C-OCDD	*52*		*17 - 157*	*07/25/18 14:47*	*07/31/18 05:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*94*		*35 - 197*	*07/25/18 14:47*	*07/31/18 05:43*	*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	0.0071	q B	0.0011	0.00060	ug/Kg	☼	07/25/18 14:47	08/01/18 01:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*78*		*24 - 169*	*07/25/18 14:47*	*08/01/18 01:05*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*88*		*35 - 197*	*07/25/18 14:47*	*08/01/18 01:05*	*1*

Client Sample ID: PDI-SC-S033-2to3
Date Collected: 07/18/18 17:45
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-2
Matrix: Solid
Percent Solids: 51.0

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	0.87	B	0.0048	0.0019	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,4,6,7,8-HpCDF	0.16	B	0.0048	0.0013	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,4,7,8,9-HpCDF	0.011	B	0.0048	0.0017	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,4,7,8-HxCDD	0.0083	B	0.0048	0.00062	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,4,7,8-HxCDF	0.019		0.0048	0.00092	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,6,7,8-HxCDD	0.037	B	0.0048	0.00064	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,6,7,8-HxCDF	0.0097	B	0.0048	0.00086	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,7,8,9-HxCDD	0.015	B	0.0048	0.00058	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,7,8,9-HxCDF	0.0017	J B	0.0048	0.00081	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,7,8-PeCDD	0.0038	J q B	0.0048	0.00079	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
1,2,3,7,8-PeCDF	0.0064	B	0.0048	0.00044	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
2,3,4,6,7,8-HxCDF	0.0068	B	0.0048	0.00074	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
2,3,4,7,8-PeCDF	0.0093		0.0048	0.00051	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
2,3,7,8-TCDD	0.0014		0.00095	0.00016	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
OCDD	8.1	E B	0.0095	0.0018	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1
OCDF	0.43	B	0.0095	0.00039	ug/Kg	☼	07/25/18 14:47	07/31/18 06:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*45*		*23 - 140*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*44*		*28 - 143*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*47*		*26 - 138*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,4,7,8-HxCDD	*78*		*32 - 141*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,4,7,8-HxCDF	*136*		*26 - 152*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,6,7,8-HxCDD	*73*		*28 - 130*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,6,7,8-HxCDF	*125*	*	*26 - 123*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,7,8,9-HxCDF	*73*		*29 - 147*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,7,8-PeCDD	*84*		*25 - 181*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-1,2,3,7,8-PeCDF	*75*		*24 - 185*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-2,3,4,6,7,8-HxCDF	*92*		*28 - 136*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-2,3,4,7,8-PeCDF	*78*		*21 - 178*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-2,3,7,8-TCDD	*74*		*25 - 164*	*07/25/18 14:47*	*07/31/18 06:29*	*1*
13C-OCDD	*51*		*17 - 157*	*07/25/18 14:47*	*07/31/18 06:29*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*102*		*35 - 197*	*07/25/18 14:47*	*07/31/18 06:29*	*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	0.013	B	0.00095	0.00066	ug/Kg	☼	07/25/18 14:47	08/01/18 00:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*77*		*24 - 169*	*07/25/18 14:47*	*08/01/18 00:28*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*86*		*35 - 197*	*07/25/18 14:47*	*08/01/18 00:28*	*1*

Client Sample ID: PDI-SC-S033-3to4
Date Collected: 07/18/18 17:50
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-3
Matrix: Solid
Percent Solids: 51.9

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	1.4	B	0.0048	0.0033	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,4,6,7,8-HpCDF	0.24	B	0.0048	0.0018	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,4,7,8,9-HpCDF	0.016	B	0.0048	0.0025	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,4,7,8-HxCDD	0.016	B	0.0048	0.00067	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,4,7,8-HxCDF	0.034		0.0048	0.0014	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,6,7,8-HxCDD	0.071	B	0.0048	0.00064	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,6,7,8-HxCDF	0.018	B	0.0048	0.0012	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,7,8,9-HxCDD	0.034	B	0.0048	0.00060	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,7,8,9-HxCDF	0.0021	J B	0.0048	0.00095	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,7,8-PeCDD	0.013	B	0.0048	0.0018	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
1,2,3,7,8-PeCDF	0.0095	B	0.0048	0.00085	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
2,3,4,6,7,8-HxCDF	0.013	B	0.0048	0.00094	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
2,3,4,7,8-PeCDF	0.020		0.0048	0.00087	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
2,3,7,8-TCDD	0.0044		0.00096	0.00028	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
OCDD	11	E B	0.0096	0.0028	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1
OCDF	0.53	B	0.0096	0.00030	ug/Kg	☼	07/25/18 14:47	07/30/18 16:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*45*		*23 - 140*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*42*		*28 - 143*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*40*		*26 - 138*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,4,7,8-HxCDD	*66*		*32 - 141*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,4,7,8-HxCDF	*102*		*26 - 152*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,6,7,8-HxCDD	*67*		*28 - 130*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,6,7,8-HxCDF	*97*		*26 - 123*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,7,8,9-HxCDF	*67*		*29 - 147*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,7,8-PeCDD	*86*		*25 - 181*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-1,2,3,7,8-PeCDF	*76*		*24 - 185*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-2,3,4,6,7,8-HxCDF	*78*		*28 - 136*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-2,3,4,7,8-PeCDF	*71*		*21 - 178*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-2,3,7,8-TCDD	*77*		*25 - 164*	*07/25/18 14:47*	*07/30/18 16:05*	*1*
13C-OCDD	*47*		*17 - 157*	*07/25/18 14:47*	*07/30/18 16:05*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*07/25/18 14:47*	*07/30/18 16:05*	*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	0.027	B	0.00096	0.00058	ug/Kg	☼	07/25/18 14:47	07/31/18 23:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*74*		*24 - 169*	*07/25/18 14:47*	*07/31/18 23:50*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*83*		*35 - 197*	*07/25/18 14:47*	*07/31/18 23:50*	*1*

Client Sample ID: PDI-SC-S034-4to5.2
Date Collected: 07/19/18 11:55
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-4
Matrix: Solid
Percent Solids: 69.3

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	**0.0011**	**J B**	0.0036	0.00011	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,4,6,7,8-HpCDF	**0.00017**	**J B q**	0.0036	0.000073	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,4,7,8,9-HpCDF	**0.00018**	**J B q**	0.0036	0.000076	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,4,7,8-HxCDD	**0.00012**	**J B q**	0.0036	0.000060	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,4,7,8-HxCDF	ND		0.0036	0.000087	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,6,7,8-HxCDD	**0.00010**	**J B q**	0.0036	0.000058	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,6,7,8-HxCDF	ND		0.0036	0.000084	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,7,8,9-HxCDD	**0.00024**	**J B**	0.0036	0.000054	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,7,8,9-HxCDF	**0.00076**	**J B**	0.0036	0.000042	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,7,8-PeCDD	ND		0.0036	0.000053	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
1,2,3,7,8-PeCDF	**0.00026**	**J B**	0.0036	0.000030	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
2,3,4,6,7,8-HxCDF	ND		0.0036	0.000048	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
2,3,4,7,8-PeCDF	ND		0.0036	0.000031	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
2,3,7,8-TCDD	**0.000097**	**J q**	0.00072	0.000030	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
2,3,7,8-TCDF	**0.000041**	**J B**	0.00072	0.000020	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
OCDD	**0.012**	**B**	0.0072	0.00022	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1
OCDF	**0.00065**	**J B q**	0.0072	0.00014	ug/Kg	☼	07/25/18 14:47	07/30/18 16:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*26*		*23 - 140*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*24*	*	*28 - 143*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*29*		*26 - 138*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,4,7,8-HxCDD	*47*		*32 - 141*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,4,7,8-HxCDF	*50*		*26 - 152*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,6,7,8-HxCDD	*45*		*28 - 130*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,6,7,8-HxCDF	*50*		*26 - 123*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,7,8,9-HxCDF	*47*		*29 - 147*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,7,8-PeCDD	*49*		*25 - 181*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-1,2,3,7,8-PeCDF	*51*		*24 - 185*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-2,3,4,6,7,8-HxCDF	*52*		*28 - 136*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-2,3,4,7,8-PeCDF	*54*		*21 - 178*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-2,3,7,8-TCDD	*56*		*25 - 164*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-2,3,7,8-TCDF	*64*		*24 - 169*	*07/25/18 14:47*	*07/30/18 16:51*	*1*
13C-OCDD	*22*		*17 - 157*	*07/25/18 14:47*	*07/30/18 16:51*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*95*		*35 - 197*	*07/25/18 14:47*	*07/30/18 16:51*	*1*

Client Sample ID: PDI-SC-S034-0to1.8
Date Collected: 07/19/18 11:45
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-5
Matrix: Solid
Percent Solids: 79.3

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	0.024	B	0.0031	0.00011	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,4,6,7,8-HpCDF	0.0067	B q	0.0031	0.000080	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,4,7,8,9-HpCDF	0.00040	J B	0.0031	0.00011	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,4,7,8-HxCDD	0.00051	J B	0.0031	0.000038	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,4,7,8-HxCDF	0.00062	J	0.0031	0.00012	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,6,7,8-HxCDD	0.0013	J B	0.0031	0.000037	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,6,7,8-HxCDF	0.00040	J B	0.0031	0.00012	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,7,8,9-HxCDD	0.00094	J B	0.0031	0.000034	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,7,8,9-HxCDF	0.00064	J B	0.0031	0.000055	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,7,8-PeCDD	0.00030	J B	0.0031	0.000047	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
1,2,3,7,8-PeCDF	0.00038	J B	0.0031	0.000047	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
2,3,4,6,7,8-HxCDF	0.00023	J B	0.0031	0.000067	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
2,3,4,7,8-PeCDF	0.00029	J	0.0031	0.000050	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
2,3,7,8-TCDD	0.00063		0.00063	0.000024	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
OCDD	0.21	B	0.0063	0.00011	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1
OCDF	0.016	B	0.0063	0.000054	ug/Kg	☼	07/25/18 14:47	07/30/18 17:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*41*		*23 - 140*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*40*		*28 - 143*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*35*		*26 - 138*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,4,7,8-HxCDD	*60*		*32 - 141*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,4,7,8-HxCDF	*62*		*26 - 152*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,6,7,8-HxCDD	*60*		*28 - 130*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,6,7,8-HxCDF	*60*		*26 - 123*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,7,8,9-HxCDF	*62*		*29 - 147*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,7,8-PeCDD	*62*		*25 - 181*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-2,3,4,6,7,8-HxCDF	*63*		*28 - 136*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-2,3,4,7,8-PeCDF	*65*		*21 - 178*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-2,3,7,8-TCDD	*67*		*25 - 164*	*07/25/18 14:47*	*07/30/18 17:37*	*1*
13C-OCDD	*35*		*17 - 157*	*07/25/18 14:47*	*07/30/18 17:37*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*93*		*35 - 197*	*07/25/18 14:47*	*07/30/18 17:37*	*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	0.00041	J B	0.00063	0.00011	ug/Kg	☼	07/25/18 14:47	08/01/18 01:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*68*		*24 - 169*	*07/25/18 14:47*	*08/01/18 01:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*88*		*35 - 197*	*07/25/18 14:47*	*08/01/18 01:43*	*1*

Client Sample ID: PDI-SC-S034-1.8to4
Date Collected: 07/19/18 11:50
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-6
Matrix: Solid
Percent Solids: 67.5

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	0.0022	J B	0.0037	0.000074	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,4,6,7,8-HpCDF	0.00050	J B q	0.0037	0.00010	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,4,7,8,9-HpCDF	ND		0.0037	0.00011	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,4,7,8-HxCDD	0.00015	J B q	0.0037	0.000039	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,4,7,8-HxCDF	0.00014	J	0.0037	0.000074	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,6,7,8-HxCDD	0.00016	J B q	0.0037	0.000038	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,6,7,8-HxCDF	0.00015	J B	0.0037	0.000077	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,7,8,9-HxCDD	0.00032	J B	0.0037	0.000035	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,7,8,9-HxCDF	0.00085	J B	0.0037	0.000031	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,7,8-PeCDD	0.000099	J B	0.0037	0.000032	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
1,2,3,7,8-PeCDF	0.00034	J B	0.0037	0.000041	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
2,3,4,6,7,8-HxCDF	0.000081	J B q	0.0037	0.000038	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000042	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
2,3,7,8-TCDD	ND		0.00073	0.000020	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
2,3,7,8-TCDF	0.000088	J B	0.00073	0.000038	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
OCDD	0.018	B	0.0073	0.000080	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1
OCDF	0.0012	J B	0.0073	0.000057	ug/Kg	☼	07/25/18 14:47	07/30/18 18:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*33*		*23 - 140*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*32*		*28 - 143*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*36*		*26 - 138*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,4,7,8-HxCDD	*44*		*32 - 141*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,4,7,8-HxCDF	*44*		*26 - 152*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,6,7,8-HxCDD	*44*		*28 - 130*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,6,7,8-HxCDF	*43*		*26 - 123*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,7,8,9-HxCDF	*50*		*29 - 147*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,7,8-PeCDD	*49*		*25 - 181*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-1,2,3,7,8-PeCDF	*51*		*24 - 185*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-2,3,4,6,7,8-HxCDF	*47*		*28 - 136*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-2,3,4,7,8-PeCDF	*54*		*21 - 178*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-2,3,7,8-TCDD	*57*		*25 - 164*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-2,3,7,8-TCDF	*65*		*24 - 169*	*07/25/18 14:47*	*07/30/18 18:23*	*1*
13C-OCDD	*26*		*17 - 157*	*07/25/18 14:47*	*07/30/18 18:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*96*		*35 - 197*	*07/25/18 14:47*	*07/30/18 18:23*	*1*

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

Lab Sample ID: MB 320-236121/1-A
Matrix: Solid
Analysis Batch: 237073

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 236121

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000194	J	0.0050	0.000015	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,4,6,7,8-HpCDF	0.0000989	J q	0.0050	0.000016	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,4,7,8,9-HpCDF	0.000156	J q	0.0050	0.000020	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,4,7,8-HxCDD	0.000187	J	0.0050	0.000022	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,4,7,8-HxCDF	ND		0.0050	0.000043	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,6,7,8-HxCDD	0.0000738	J q	0.0050	0.000021	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,6,7,8-HxCDF	0.0000965	J	0.0050	0.000043	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,7,8,9-HxCDD	0.000106	J	0.0050	0.000020	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,7,8,9-HxCDF	0.000535	J	0.0050	0.000021	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,7,8-PeCDD	0.0000752	J	0.0050	0.000023	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
1,2,3,7,8-PeCDF	0.000255	J	0.0050	0.000025	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
2,3,4,6,7,8-HxCDF	0.0000624	J q	0.0050	0.000025	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
2,3,4,7,8-PeCDF	ND		0.0050	0.000027	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
2,3,7,8-TCDD	ND		0.0010	0.000022	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
2,3,7,8-TCDF	0.0000297	J q	0.0010	0.000012	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
OCDD	0.000966	J	0.010	0.000018	ug/Kg		07/25/18 14:47	07/30/18 13:47	1
OCDF	0.000271	J	0.010	0.000023	ug/Kg		07/25/18 14:47	07/30/18 13:47	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*76*		*23 - 140*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*75*		*28 - 143*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*77*		*26 - 138*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,4,7,8-HxCDD	*71*		*32 - 141*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,4,7,8-HxCDF	*72*		*26 - 152*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,6,7,8-HxCDD	*72*		*28 - 130*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,6,7,8-HxCDF	*73*		*26 - 123*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,7,8,9-HxCDF	*74*		*29 - 147*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,7,8-PeCDD	*69*		*25 - 181*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-1,2,3,7,8-PeCDF	*70*		*24 - 185*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-2,3,4,6,7,8-HxCDF	*74*		*28 - 136*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-2,3,4,7,8-PeCDF	*69*		*21 - 178*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-2,3,7,8-TCDD	*72*		*25 - 164*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-2,3,7,8-TCDF	*72*		*24 - 169*	*07/25/18 14:47*	*07/30/18 13:47*	*1*
13C-OCDD	*72*		*17 - 157*	*07/25/18 14:47*	*07/30/18 13:47*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*90*		*35 - 197*	*07/25/18 14:47*	*07/30/18 13:47*	*1*

Lab Sample ID: LCS 320-236121/2-A
Matrix: Solid
Analysis Batch: 237073

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 236121

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.100		ug/Kg		100	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.100		ug/Kg		100	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.103		ug/Kg		103	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.101		ug/Kg		101	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.102		ug/Kg		102	72 - 134

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

Lab Sample ID: LCS 320-236121/2-A
Matrix: Solid
Analysis Batch: 237073

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 236121

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2,3,6,7,8-HxCDD			0.100	0.101		ug/Kg		101	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	0.104		ug/Kg		104	78 - 130		
1,2,3,7,8-PeCDD			0.100	0.102		ug/Kg		102	70 - 142		
1,2,3,7,8-PeCDF			0.100	0.103		ug/Kg		103	80 - 134		
2,3,4,6,7,8-HxCDF			0.100	0.103		ug/Kg		103	70 - 156		
2,3,4,7,8-PeCDF			0.100	0.102		ug/Kg		102	68 - 160		
2,3,7,8-TCDD			0.0200	0.0198		ug/Kg		99	67 - 158		
2,3,7,8-TCDF			0.0200	0.0201		ug/Kg		101	75 - 158		
OCDD			0.200	0.198		ug/Kg		99	78 - 144		
OCDF			0.200	0.213		ug/Kg		107	63 - 170		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*76*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*75*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*77*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*70*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*71*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*70*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*71*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*74*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*68*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*70*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*74*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*69*		*13 - 328*
13C-2,3,7,8-TCDD	*71*		*20 - 175*
13C-2,3,7,8-TCDF	*72*		*22 - 152*
13C-OCDD	*73*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*92*		*31 - 191*

Lab Sample ID: LCSD 320-236121/3-A
Matrix: Solid
Analysis Batch: 237073

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 236121

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	0.101		ug/Kg		101	70 - 140	1	50
1,2,3,4,6,7,8-HpCDF			0.100	0.103		ug/Kg		103	82 - 122	3	50
1,2,3,4,7,8,9-HpCDF			0.100	0.104		ug/Kg		104	78 - 138	1	50
1,2,3,4,7,8-HxCDD			0.100	0.101		ug/Kg		101	70 - 164	0	50
1,2,3,4,7,8-HxCDF			0.100	0.103		ug/Kg		103	72 - 134	1	50
1,2,3,6,7,8-HxCDD			0.100	0.101		ug/Kg		101	76 - 134	0	50
1,2,3,6,7,8-HxCDF			0.100	0.102		ug/Kg		102	84 - 130	1	50
1,2,3,7,8,9-HxCDD			0.100	0.105		ug/Kg		105	64 - 162	0	50
1,2,3,7,8,9-HxCDF			0.100	0.102		ug/Kg		102	78 - 130	1	50
1,2,3,7,8-PeCDD			0.100	0.101		ug/Kg		101	70 - 142	1	50

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

Lab Sample ID: LCSD 320-236121/3-A
Matrix: Solid
Analysis Batch: 237073

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 236121

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			0.100	0.103		ug/Kg		103	80 - 134	0	50
2,3,4,6,7,8-HxCDF			0.100	0.104		ug/Kg		104	70 - 156	0	50
2,3,4,7,8-PeCDF			0.100	0.103		ug/Kg		103	68 - 160	1	50
2,3,7,8-TCDD			0.0200	0.0200		ug/Kg		100	67 - 158	1	50
2,3,7,8-TCDF			0.0200	0.0202		ug/Kg		101	75 - 158	0	50
OCDD			0.200	0.200		ug/Kg		100	78 - 144	1	50
OCDF			0.200	0.212		ug/Kg		106	63 - 170	1	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*80*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*79*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*81*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*72*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*74*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*75*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*75*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*78*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*72*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*74*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*77*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*72*		*13 - 328*
13C-2,3,7,8-TCDD	*75*		*20 - 175*
13C-2,3,7,8-TCDF	*77*		*22 - 152*
13C-OCDD	*77*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*91*		*31 - 191*

Lab Chronicle

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

TestAmerica Job ID: 580-79019-2

Client Sample ID: PDI-SC-S033-0to2 — Lab Sample ID: 580-79019-1

Date Collected: 07/18/18 17:40 — **Matrix: Solid**
Date Received: 07/20/18 13:17 — **Percent Solids: 44.5**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B		1	237074	07/31/18 05:43	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	237440	08/01/18 01:05	KSS	TAL SAC

Client Sample ID: PDI-SC-S033-2to3 — Lab Sample ID: 580-79019-2

Date Collected: 07/18/18 17:45 — **Matrix: Solid**
Date Received: 07/20/18 13:17 — **Percent Solids: 51.0**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B		1	237074	07/31/18 06:29	SMA	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	237440	08/01/18 00:28	KSS	TAL SAC

Client Sample ID: PDI-SC-S033-3to4 — Lab Sample ID: 580-79019-3

Date Collected: 07/18/18 17:50 — **Matrix: Solid**
Date Received: 07/20/18 13:17 — **Percent Solids: 51.9**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B		1	237073	07/30/18 16:05	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	237440	07/31/18 23:50	KSS	TAL SAC

Client Sample ID: PDI-SC-S034-4to5.2 — Lab Sample ID: 580-79019-4

Date Collected: 07/19/18 11:55 — **Matrix: Solid**
Date Received: 07/20/18 13:17 — **Percent Solids: 69.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B		1	237073	07/30/18 16:51	ALM	TAL SAC

Client Sample ID: PDI-SC-S034-0to1.8 — Lab Sample ID: 580-79019-5

Date Collected: 07/19/18 11:45 — **Matrix: Solid**
Date Received: 07/20/18 13:17 — **Percent Solids: 79.3**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B		1	237073	07/30/18 17:37	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	237440	08/01/18 01:43	KSS	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-79019-2

Client Sample ID: PDI-SC-S034-1.8to4
Date Collected: 07/19/18 11:50
Date Received: 07/20/18 13:17

Lab Sample ID: 580-79019-6
Matrix: Solid
Percent Solids: 67.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			236121	07/25/18 14:47	SR1	TAL SAC
Total/NA	Analysis	1613B		1	237073	07/30/18 18:23	ALM	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: 580-79019-2
Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
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	08-11-18
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
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

Sample Summary

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

TestAmerica Job ID: 580-79019-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79019-1	PDI-SC-S033-0to2	Solid	07/18/18 17:40	07/20/18 13:17
580-79019-2	PDI-SC-S033-2to3	Solid	07/18/18 17:45	07/20/18 13:17
580-79019-3	PDI-SC-S033-3to4	Solid	07/18/18 17:50	07/20/18 13:17
580-79019-4	PDI-SC-S034-4to5.2	Solid	07/19/18 11:55	07/20/18 13:17
580-79019-5	PDI-SC-S034-0to1.8	Solid	07/19/18 11:45	07/20/18 13:17
580-79019-6	PDI-SC-S034-1.8to4	Solid	07/19/18 11:50	07/20/18 13:17

SUBSURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010**	**Site Contact: Jennifer Ray / Michaela McCoog** **Laboratory Contact: Elaine-Walker**	**Date: 7/20/18** **Carrier: Courier**	COC No: 1 __1__ of __1__ pages

Client Contact

AECOM
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: Subsurface Sediment
Sample Type:

Analysis Turnaround Time
Calendar (C) or Work Days (W) _W____

[x] 21 days

[ ] Other _____

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/Fs 1613B	Archive	Grain size ASTM D7928/D6913	PCB Aroclors, PAHs, Total Organic Carbon, Total Solids 8082A, 8270D-SIM, 9060, 160.3	Atterberg Limits ASTM D4318	Sample Specific Notes:
PDI-SC-S033 - 0 to 2	7/18/2018	17:40	SE		AF	4		x	x	x	x		
PDI-SC-S033 - 2 to 3	7/18/2018	17:45	SE		AF	4		x	x	x	x		
PDI-SC-S033 - 3 to 4	7/18/2018	17:50	SE		AF	4		x	x	x	x		
PDI-SC-S034 - 4 to 5.2	7/19/2018	11:55	SE		AF	4		x	x	x	x		
PDI-SC-S034 - 0 to 1.8	7/19/2018	11:45	SE		AF	4		x	x	x	x		
PDI-SC-S034 - 1.8 to 4	7/19/2018	11:50	SE		AF	5		x	x	x	x	x	
- to													
- to													
- to													
- to													
- to													
- to													
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Col								AG	AG	WMG	WMG	AG	

Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid

Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Sample Disposal
[ ] Return To Client [X] posal By Lab [X] chive For 12 Months

Special Instructions/QC Requirements & Comments: **Separate reports for each lab**

5.1

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	AECOM	07/20/2018 1237		M.E.	7/20/18 1237
	M.E.	7/20/18 1415		TAPOR	7/20/18 1415

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8/3/2018

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047	**SUBSURFACE SEDIMENT** **CHAIN OF CUSTODY**		
Client Contact	Project Contact: Amy Dahl / Chelsey Cook	Site Contact: Jennifer Ray / Michaela McCoog	Date: 7/20/18
AECOM	Tel: (206) 438-2261 / (206) 438-2010	Laboratory Contact: Elaine-Walker	Carrier: Courier
1111 3rd Ave Suite 1600	Analysis Turnaround Time		COC No: 1
Seattle, WA 98101	Calendar (C) or Work Days (W) W		1 of 1 pages
Phone: (206) 438-2700 Fax: 1+(866) 495-5288 Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	[x] 21 days		
Portland, OR	[ ] Other _____		
Project # 60566335 Study: Subsurface Sediment			
Sample Type:			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCDD/Fs 1613B	Archive	Grain size ASTM D7928/D6913	PCB Aroclors, PAHs, Total Organic Carbon, Total Solids 8082A, 8270D-SIM, 9060, 160.3	Atterberg Limits ASTM D4318	Sample Specific Notes:
PDI-SC-S033 - 0 to 2	7/18/2018	17:40	SE		AF	4		x	x	x	x		
PDI-SC-S033 - 2 to 3	7/18/2018	17:45	SE		AF	4		x	x	x	x		
PDI-SC-S033 - 3 to 4	7/18/2018	17:50	SE		AF	4		x	x	x	x		
PDI-SC-S034 - 4 to 5.2	7/19/2018	11:55	SE		AF	4		x	x	x	x		
PDI-SC-S034 - 0 to 1.8	7/19/2018	11:45	SE		AF	4		x	x	x	x		
PDI-SC-S034 - 1.8 to 4	7/19/2018	11:50	SE		AF	5		x	x	x	x	x	
- to													
- to													
- to													
- to													
- to													
- to													
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Col								AG	AG	WMG	WMG	AG	

580-79019 Chain of Custody

Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid

Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Sample Disposal
[ ] Return To Client [X] posal By Lab [X] chive For 12 Months

Special Instructions/QC Requirements & Comments: **Separate reports for each lab**

5.1

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	07/20/2018 1237	[signature]	M. E.	7/20/18 1237
[signature]	M.E.	7/20/18 1415	[signature]	TAPOR	7/20/18 1415
[signature]	TAPOR	7/20/18 1700	[signature]	PASCA	7-21-18 1100

IRS= -0.8/-0.8

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Walker, Elaine M	Carrier Tracking No(s):	COC No: 580-57313.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-79019-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 8/7/2018			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Portland Harbor Pre-Remedial Design	Project #: 58012120			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	AutoOP/ PH Frozen Archive Container billed @ $0.	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
PDI-SC-S033 - 0 to 2 (580-79019-1)	7/18/18	17:40 Pacific		Solid			X	X	2	
PDI-SC-S033 - 2 to 3 (580-79019-2)	7/18/18	17:45 Pacific		Solid			X	X	2	
PDI-SC-S033 - 3 to 4 (580-79019-3)	7/18/18	17:50 Pacific		Solid			X	X	2	
PDI-SC-S034 - 4 to 5.2 (580-79019-4)	7/19/18	11:55 Pacific		Solid			X	X	2	
PDI-SC-S034 - 0 to 1.8 (580-79019-5)	7/19/18	11:45 Pacific		Solid			X	X	2	
PDI-SC-S034 - 1.8 to 4 (580-79019-6)	7/19/18	11:50 Pacific		Solid			X	X	2	

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/tests/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 complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date: 7/20/18	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 7/20/18 1700 KEF	Company: TAPOR	Received by: [signature]	Date/Time: 7/21/18 915	Company: TA Sac
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 5.4c		

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79019-2

Login Number: 79019
List Number: 1
Creator: Rogers, Angeline D

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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 <6mm (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: 580-79019-2

Login Number: 79019
List Number: 3
Creator: Her, David A

List Source: TestAmerica Sacramento
List Creation: 07/21/18 03:30 PM

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.	N/A	
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	5.4c
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

580-79019 Field Sheet

Job:_____

Tracking #_4423 0750 7281_____ SO / PO / FO / UPS / Other _____

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

Notes:_____

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

Ice_X_ Wet_____ Gel _____ Other _____

Cooler Custody Seal: _____

Sample Custody Seal: _____

Cooler ID:_____

Temp: Observed_____

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:_____ Date:_____ Time_____

*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: 580-79019-2

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)
580-79019-1	PDI-SC-S033-0to2	50	46	36	77	111	72	107	70
580-79019-1 - RA	PDI-SC-S033-0to2								
580-79019-2	PDI-SC-S033-2to3	45	44	47	78	136	73	125 *	73
580-79019-2 - RA	PDI-SC-S033-2to3								
580-79019-3	PDI-SC-S033-3to4	45	42	40	66	102	67	97	67
580-79019-3 - RA	PDI-SC-S033-3to4								
580-79019-4	PDI-SC-S034-4to5.2	26	24 *	29	47	50	45	50	47
580-79019-5	PDI-SC-S034-0to1.8	41	40	35	60	62	60	60	62
580-79019-5 - RA	PDI-SC-S034-0to1.8								
580-79019-6	PDI-SC-S034-1.8to4	33	32	36	44	44	44	43	50
MB 320-236121/1-A	Method Blank	76	75	77	71	72	72	73	74

		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)	
580-79019-1	PDI-SC-S033-0to2	78	77	81	72	68		52	
580-79019-1 - RA	PDI-SC-S033-0to2						78		
580-79019-2	PDI-SC-S033-2to3	84	75	92	78	74		51	
580-79019-2 - RA	PDI-SC-S033-2to3						77		
580-79019-3	PDI-SC-S033-3to4	86	76	78	71	77		47	
580-79019-3 - RA	PDI-SC-S033-3to4						74		
580-79019-4	PDI-SC-S034-4to5.2	49	51	52	54	56	64	22	
580-79019-5	PDI-SC-S034-0to1.8	62	64	63	65	67		35	
580-79019-5 - RA	PDI-SC-S034-0to1.8						68		
580-79019-6	PDI-SC-S034-1.8to4	49	51	47	54	57	65	26	
MB 320-236121/1-A	Method Blank	69	70	74	69	72	72	72	

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

Isotope Dilution Summary

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

TestAmerica Job ID: 580-79019-2

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 (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-236121/2-A	Lab Control Sample	76	75	77	70	71	70	71	74
LCSD 320-236121/3-A	Lab Control Sample Dup	80	79	81	72	74	75	75	78

		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 320-236121/2-A	Lab Control Sample	68	70	74	69	71	72	73
LCSD 320-236121/3-A	Lab Control Sample Dup	72	74	77	72	75	77	77

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