TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-79057-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Authorized for release by:
8/3/2018 4:00:45 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: 580-79057-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-79057-2

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 7/23/2018 2:35 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.4º C and 2.6º C.

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

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

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Samples PDI-SC-S022- 0 to 1.8, PDI-SC-S022- 1.8 to 4, PDI-SC-S022- 4 to 5.2, PDI-SC-S033- 0 to 2, PDI-SC-S033- 2 to 3, PDI-SC-S033- 3 to 4 are documented on the COC, but we received no containers for these samples. These samples have not been logged in. The Client confirmed that these samples were received in an earlier shipment.

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-S036-0to1.4 (580-79057-1), PDI-SC-S036-1.4to3.4 (580-79057-2), PDI-SC-S036-3.4to5.2 (580-79057-3), PDI-SC-S022-0to2 (580-79057-4), PDI-SC-S022-2to4 (580-79057-5) and PDI-SC-S022-4to6 (580-79057-6) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 07/25/2018 and analyzed on 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.

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-S036-0to1.4 (580-79057-1), PDI-SC-S036-1.4to3.4 (580-79057-2), PDI-SC-S036-3.4to5.2 (580-79057-3) 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.

Job ID: 580-79057-2 (Continued)

Laboratory: TestAmerica Seattle (Continued)

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SC-S036-0to1.4 (580-79057-1), PDI-SC-S036-1.4to3.4 (580-79057-2), PDI-SC-S036-3.4to5.2 (580-79057-3), PDI-SC-S022-0to2 (580-79057-4), PDI-SC-S022-2to4 (580-79057-5) and PDI-SC-S022-4to6 (580-79057-6). 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: 580-79057-2

Qualifiers

Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
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.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Client Sample ID: PDI-SC-S036-0to1.4
Date Collected: 07/20/18 15:50
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-1
Matrix: Solid
Percent Solids: 52.1

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	0.067	B	0.0047	0.00033	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,4,6,7,8-HpCDF	0.012	q B	0.0047	0.00023	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,4,7,8,9-HpCDF	0.0017	J B	0.0047	0.00026	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,4,7,8-HxCDD	0.00084	J B	0.0047	0.000089	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,4,7,8-HxCDF	0.0066		0.0047	0.00019	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,6,7,8-HxCDD	0.0034	J B	0.0047	0.000084	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,6,7,8-HxCDF	0.0021	J B	0.0047	0.00019	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,7,8,9-HxCDD	0.0021	J B	0.0047	0.000079	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,7,8,9-HxCDF	0.00078	J B	0.0047	0.000083	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,7,8-PeCDD	0.00047	J B	0.0047	0.000074	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
1,2,3,7,8-PeCDF	0.0014	J B	0.0047	0.00011	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
2,3,4,6,7,8-HxCDF	0.00044	J B	0.0047	0.00011	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
2,3,4,7,8-PeCDF	0.00068	J	0.0047	0.00012	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
2,3,7,8-TCDD	0.00034	J q	0.00095	0.000063	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
OCDD	0.71	B	0.0095	0.00027	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1
OCDF	0.038	B	0.0095	0.000088	ug/Kg	☼	07/25/18 14:47	07/31/18 01:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*42*		*23 - 140*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*38*		*28 - 143*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*42*		*26 - 138*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,4,7,8-HxCDD	*50*		*32 - 141*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,4,7,8-HxCDF	*51*		*26 - 152*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,6,7,8-HxCDF	*50*		*26 - 123*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,7,8,9-HxCDF	*55*		*29 - 147*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,7,8-PeCDD	*55*		*25 - 181*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-1,2,3,7,8-PeCDF	*57*		*24 - 185*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-2,3,4,6,7,8-HxCDF	*52*		*28 - 136*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-2,3,4,7,8-PeCDF	*60*		*21 - 178*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-2,3,7,8-TCDD	*62*		*25 - 164*	*07/25/18 14:47*	*07/31/18 01:07*	*1*
13C-OCDD	*33*		*17 - 157*	*07/25/18 14:47*	*07/31/18 01:07*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*96*		*35 - 197*	*07/25/18 14:47*	*07/31/18 01:07*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.0014	B	0.00095	0.00012	ug/Kg	☼	07/25/18 14:47	08/01/18 03:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*73*		*24 - 169*	*07/25/18 14:47*	*08/01/18 03:37*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*90*		*35 - 197*	*07/25/18 14:47*	*08/01/18 03:37*	*1*

Client Sample ID: PDI-SC-S036-1.4to3.4
Date Collected: 07/20/18 15:55
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-2
Matrix: Solid
Percent Solids: 64.9

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.15	B	0.0037	0.00072	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,4,6,7,8-HpCDF	0.037	B	0.0037	0.00037	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,4,7,8,9-HpCDF	0.0024	J B	0.0037	0.00050	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,4,7,8-HxCDD	0.00093	J q B	0.0037	0.00013	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,4,7,8-HxCDF	0.0097		0.0037	0.00035	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,6,7,8-HxCDD	0.0060	B	0.0037	0.00013	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,6,7,8-HxCDF	0.0035	J B	0.0037	0.00034	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,7,8,9-HxCDD	0.0028	J B	0.0037	0.00012	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,7,8,9-HxCDF	0.00074	J B	0.0037	0.00016	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,7,8-PeCDD	0.00065	J B	0.0037	0.00015	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
1,2,3,7,8-PeCDF	0.0029	J B	0.0037	0.00016	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
2,3,4,6,7,8-HxCDF	0.00082	J B	0.0037	0.00020	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
2,3,4,7,8-PeCDF	0.0011	J	0.0037	0.00017	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
2,3,7,8-TCDD	0.00036	J q	0.00075	0.000033	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
OCDD	1.9	B	0.0075	0.00056	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1
OCDF	0.12	B	0.0075	0.000062	ug/Kg	☼	07/25/18 14:47	07/31/18 01:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*48*		*23 - 140*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*47*		*28 - 143*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*43*		*26 - 138*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,4,7,8-HxCDD	*53*		*32 - 141*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,4,7,8-HxCDF	*53*		*26 - 152*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,6,7,8-HxCDD	*51*		*28 - 130*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,6,7,8-HxCDF	*53*		*26 - 123*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,7,8,9-HxCDF	*55*		*29 - 147*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,7,8-PeCDD	*54*		*25 - 181*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-1,2,3,7,8-PeCDF	*55*		*24 - 185*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-2,3,4,6,7,8-HxCDF	*54*		*28 - 136*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-2,3,4,7,8-PeCDF	*55*		*21 - 178*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-2,3,7,8-TCDD	*56*		*25 - 164*	*07/25/18 14:47*	*07/31/18 01:53*	*1*
13C-OCDD	*43*		*17 - 157*	*07/25/18 14:47*	*07/31/18 01:53*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*95*		*35 - 197*	*07/25/18 14:47*	*07/31/18 01:53*	*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	0.0016	B	0.00075	0.00013	ug/Kg	☼	07/25/18 14:47	08/01/18 04:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*58*		*24 - 169*	*07/25/18 14:47*	*08/01/18 04:15*	*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 04:15*	*1*

Client Sample ID: PDI-SC-S036-3.4to5.2
Date Collected: 07/20/18 16:00
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-3
Matrix: Solid
Percent Solids: 63.1

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	0.17	B	0.0040	0.00042	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,4,6,7,8-HpCDF	0.26	B	0.0040	0.00069	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,4,7,8,9-HpCDF	0.0043	B	0.0040	0.0015	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,4,7,8-HxCDD	0.0013	J B	0.0040	0.00010	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,4,7,8-HxCDF	0.0086		0.0040	0.00073	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,6,7,8-HxCDD	0.0080	B	0.0040	0.00010	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,6,7,8-HxCDF	0.011	B	0.0040	0.00063	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,7,8,9-HxCDD	0.0031	J B	0.0040	0.000095	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,7,8,9-HxCDF	0.00074	J B	0.0040	0.00038	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,7,8-PeCDD	0.0012	J B	0.0040	0.00012	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
1,2,3,7,8-PeCDF	0.0028	J B	0.0040	0.00036	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
2,3,4,6,7,8-HxCDF	0.0028	J B	0.0040	0.00044	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
2,3,4,7,8-PeCDF	0.0028	J	0.0040	0.00039	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
2,3,7,8-TCDD	0.00040	J q	0.00080	0.000045	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
OCDD	2.0	B	0.0080	0.00053	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1
OCDF	0.27	B	0.0080	0.00011	ug/Kg	☼	07/25/18 14:47	07/31/18 02:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*53*		*23 - 140*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*49*		*28 - 143*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*34*		*26 - 138*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,4,7,8-HxCDD	*64*		*32 - 141*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,4,7,8-HxCDF	*77*		*26 - 152*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,6,7,8-HxCDD	*61*		*28 - 130*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,6,7,8-HxCDF	*74*		*26 - 123*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,7,8,9-HxCDF	*67*		*29 - 147*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,7,8-PeCDD	*72*		*25 - 181*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-1,2,3,7,8-PeCDF	*67*		*24 - 185*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-2,3,4,6,7,8-HxCDF	*66*		*28 - 136*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-2,3,7,8-TCDD	*68*		*25 - 164*	*07/25/18 14:47*	*07/31/18 02:39*	*1*
13C-OCDD	*46*		*17 - 157*	*07/25/18 14:47*	*07/31/18 02:39*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*107*		*35 - 197*	*07/25/18 14:47*	*07/31/18 02:39*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.0021	B	0.00080	0.00055	ug/Kg	☼	07/25/18 14:47	08/01/18 04:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*93*		*24 - 169*	*07/25/18 14:47*	*08/01/18 04:53*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*110*		*35 - 197*	*07/25/18 14:47*	*08/01/18 04:53*	*1*

Client Sample ID: PDI-SC-S022-0to2
Date Collected: 07/20/18 13:30
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-4
Matrix: Solid
Percent Solids: 67.4

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	0.0024	J B	0.0037	0.000051	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,4,6,7,8-HpCDF	0.00020	J q B	0.0037	0.000044	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,4,7,8,9-HpCDF	0.00014	J B	0.0037	0.000051	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,4,7,8-HxCDD	0.00011	J q B	0.0037	0.000038	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.000084	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,6,7,8-HxCDD	0.00012	J B	0.0037	0.000036	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.000082	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,7,8,9-HxCDD	0.00016	J B	0.0037	0.000034	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,7,8,9-HxCDF	0.00073	J B	0.0037	0.000038	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,7,8-PeCDD	ND		0.0037	0.000038	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
1,2,3,7,8-PeCDF	0.00029	J B	0.0037	0.000025	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.000046	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000026	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
2,3,7,8-TCDD	0.00036	J	0.00074	0.000032	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
2,3,7,8-TCDF	0.000036	J q B	0.00074	0.000018	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
OCDD	0.016	B	0.0074	0.000068	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1
OCDF	0.00065	J B	0.0074	0.000062	ug/Kg	☼	07/25/18 14:47	07/31/18 03:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*44*		*23 - 140*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*42*		*28 - 143*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*45*		*26 - 138*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,4,7,8-HxCDD	*50*		*32 - 141*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,4,7,8-HxCDF	*51*		*26 - 152*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,6,7,8-HxCDD	*49*		*28 - 130*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,6,7,8-HxCDF	*51*		*26 - 123*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,7,8,9-HxCDF	*54*		*29 - 147*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,7,8-PeCDD	*53*		*25 - 181*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-1,2,3,7,8-PeCDF	*55*		*24 - 185*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-2,3,4,6,7,8-HxCDF	*54*		*28 - 136*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-2,3,4,7,8-PeCDF	*56*		*21 - 178*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-2,3,7,8-TCDD	*59*		*25 - 164*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-2,3,7,8-TCDF	*64*		*24 - 169*	*07/25/18 14:47*	*07/31/18 03:25*	*1*
13C-OCDD	*36*		*17 - 157*	*07/25/18 14:47*	*07/31/18 03:25*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*96*		*35 - 197*	*07/25/18 14:47*	*07/31/18 03:25*	*1*

Client Sample ID: PDI-SC-S022-2to4
Date Collected: 07/20/18 13:35
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-5
Matrix: Solid
Percent Solids: 67.7

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	**0.00044**	**J q B**	0.0037	0.000037	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,4,6,7,8-HpCDF	ND		0.0037	0.000043	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,4,7,8,9-HpCDF	ND		0.0037	0.000048	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,4,7,8-HxCDD	**0.00011**	**J B**	0.0037	0.000028	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.000053	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,6,7,8-HxCDD	**0.000039**	**J q B**	0.0037	0.000027	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.000053	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,7,8,9-HxCDD	ND		0.0037	0.000025	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,7,8,9-HxCDF	**0.00050**	**J B**	0.0037	0.000023	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,7,8-PeCDD	ND		0.0037	0.000028	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
1,2,3,7,8-PeCDF	**0.00020**	**J B**	0.0037	0.000022	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.000029	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000023	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
2,3,7,8-TCDD	**0.00026**	**J q**	0.00074	0.000025	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
2,3,7,8-TCDF	ND		0.00074	0.000016	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
OCDD	**0.0047**	**J B**	0.0074	0.000041	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1
OCDF	ND		0.0074	0.000042	ug/Kg	☼	07/25/18 14:47	07/31/18 04:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*47*		*23 - 140*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*45*		*28 - 143*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*50*		*26 - 138*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,4,7,8-HxCDD	*51*		*32 - 141*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,4,7,8-HxCDF	*52*		*26 - 152*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,6,7,8-HxCDD	*51*		*28 - 130*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,6,7,8-HxCDF	*52*		*26 - 123*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,7,8,9-HxCDF	*56*		*29 - 147*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,7,8-PeCDD	*52*		*25 - 181*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-1,2,3,7,8-PeCDF	*55*		*24 - 185*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-2,3,4,6,7,8-HxCDF	*54*		*28 - 136*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-2,3,4,7,8-PeCDF	*57*		*21 - 178*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-2,3,7,8-TCDD	*59*		*25 - 164*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-2,3,7,8-TCDF	*63*		*24 - 169*	*07/25/18 14:47*	*07/31/18 04:11*	*1*
13C-OCDD	*39*		*17 - 157*	*07/25/18 14:47*	*07/31/18 04:11*	*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 04:11*	*1*

Client Sample ID: PDI-SC-S022-4to6
Date Collected: 07/20/18 13:40
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-6
Matrix: Solid
Percent Solids: 66.0

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	**0.00061**	**J B**	0.0037	0.000041	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,4,6,7,8-HpCDF	ND		0.0037	0.000037	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,4,7,8,9-HpCDF	ND		0.0037	0.000040	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,4,7,8-HxCDD	**0.000077**	**J q B**	0.0037	0.000028	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,4,7,8-HxCDF	ND		0.0037	0.000041	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,6,7,8-HxCDD	**0.000042**	**J q B**	0.0037	0.000028	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,6,7,8-HxCDF	ND		0.0037	0.000042	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,7,8,9-HxCDD	**0.00011**	**J q B**	0.0037	0.000025	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,7,8,9-HxCDF	**0.00057**	**J B**	0.0037	0.000018	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,7,8-PeCDD	ND		0.0037	0.000033	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
1,2,3,7,8-PeCDF	**0.00022**	**J B**	0.0037	0.000020	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
2,3,4,6,7,8-HxCDF	ND		0.0037	0.000023	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
2,3,4,7,8-PeCDF	ND		0.0037	0.000021	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
2,3,7,8-TCDD	ND		0.00075	0.000025	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
2,3,7,8-TCDF	**0.000021**	**J q B**	0.00075	0.000015	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
OCDD	**0.0054**	**J B**	0.0075	0.000044	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1
OCDF	ND		0.0075	0.000045	ug/Kg	☼	07/25/18 14:47	07/31/18 04:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*46*		*23 - 140*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*43*		*28 - 143*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*49*		*26 - 138*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,4,7,8-HxCDD	*49*		*32 - 141*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,4,7,8-HxCDF	*50*		*26 - 152*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,6,7,8-HxCDD	*49*		*28 - 130*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,6,7,8-HxCDF	*50*		*26 - 123*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,7,8,9-HxCDF	*54*		*29 - 147*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,7,8-PeCDD	*50*		*25 - 181*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-1,2,3,7,8-PeCDF	*52*		*24 - 185*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-2,3,4,6,7,8-HxCDF	*52*		*28 - 136*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-2,3,4,7,8-PeCDF	*53*		*21 - 178*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-2,3,7,8-TCDD	*57*		*25 - 164*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-2,3,7,8-TCDF	*60*		*24 - 169*	*07/25/18 14:47*	*07/31/18 04:57*	*1*
13C-OCDD	*37*		*17 - 157*	*07/25/18 14:47*	*07/31/18 04:57*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*92*		*35 - 197*	*07/25/18 14:47*	*07/31/18 04:57*	*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: 580-79057-2

Client Sample ID: PDI-SC-S036-0to1.4 — Lab Sample ID: 580-79057-1

Date Collected: 07/20/18 15:50 — **Matrix: Solid**
Date Received: 07/23/18 14:35 — **Percent Solids: 52.1**

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 01:07	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 03:37	KSS	TAL SAC

Client Sample ID: PDI-SC-S036-1.4to3.4 — Lab Sample ID: 580-79057-2

Date Collected: 07/20/18 15:55 — **Matrix: Solid**
Date Received: 07/23/18 14:35 — **Percent Solids: 64.9**

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	237074	07/31/18 01:53	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 04:15	KSS	TAL SAC

Client Sample ID: PDI-SC-S036-3.4to5.2 — Lab Sample ID: 580-79057-3

Date Collected: 07/20/18 16:00 — **Matrix: Solid**
Date Received: 07/23/18 14:35 — **Percent Solids: 63.1**

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 02:39	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 04:53	KSS	TAL SAC

Client Sample ID: PDI-SC-S022-0to2 — Lab Sample ID: 580-79057-4

Date Collected: 07/20/18 13:30 — **Matrix: Solid**
Date Received: 07/23/18 14:35 — **Percent Solids: 67.4**

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 03:25	SMA	TAL SAC

Client Sample ID: PDI-SC-S022-2to4 — Lab Sample ID: 580-79057-5

Date Collected: 07/20/18 13:35 — **Matrix: Solid**
Date Received: 07/23/18 14:35 — **Percent Solids: 67.7**

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 04:11	SMA	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-79057-2

Client Sample ID: PDI-SC-S022-4to6
Date Collected: 07/20/18 13:40
Date Received: 07/23/18 14:35

Lab Sample ID: 580-79057-6
Matrix: Solid
Percent Solids: 66.0

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 04:57	SMA	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: 580-79057-2
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: 580-79057-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79057-1	PDI-SC-S036-0to1.4	Solid	07/20/18 15:50	07/23/18 14:35
580-79057-2	PDI-SC-S036-1.4to3.4	Solid	07/20/18 15:55	07/23/18 14:35
580-79057-3	PDI-SC-S036-3.4to5.2	Solid	07/20/18 16:00	07/23/18 14:35
580-79057-4	PDI-SC-S022-0to2	Solid	07/20/18 13:30	07/23/18 14:35
580-79057-5	PDI-SC-S022-2to4	Solid	07/20/18 13:35	07/23/18 14:35
580-79057-6	PDI-SC-S022-4to6	Solid	07/20/18 13:40	07/23/18 14:35

SUBSURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047			
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:	Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) _W_ [x] 21 days [ ] Other _____	Site Contact: Jennifer Ray / Michaela McCoog Laboratory Contact: Elaine-Walker	Date: 7/23/18 Carrier: Courier

COC No: 3
1 of 1 pages

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-S036 - 0 to 1.4	7/20/2018	15:50	SC		ED	4		x	x	x	x		
PDI-SC-S036 - 1.4 to 3.4	7/20/2018	15:55	SC		ED	4		x	x	x	x		
PDI-SC-S036 - 3.4 to 5.2	7/20/2018	16:00	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 0 to 2	7/20/2018	13:30	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 2 to 4	7/20/2018	13:35	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 4 to 6	7/20/2018	13:40	SC		ED	4		x	x	x	x		
PDI-SC-S034 - 0 to 1.8	7/20/2018	11:45	SC		ED	4		x	x	x	x		
PDI-SC-S034 - 1.8 to 4	7/20/2018	11:50	SC		ED	5		x	x	x	x	x	
PDI-SC-S034 - 4 to 5.2	7/20/2018	11:55	SC		ED	4		x	x	x	x		
PDI-SC-S033 - 0 to 2	7/20/2018	17:40	SC		ED			x	x	x	x		
PDI-SC-S033 - 2 to 3	7/20/2018	17:45	SC		ED			x	x	x	x		
PDI-SC-S033 - 3 to 4	7/20/2018	17:50	SC		ED			x	x	x	x		
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Colu								AG	AG	WMG	WMG	AG	
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid													

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

580-79057 Chain of Custody

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

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

24, 2.6

Relinquished by:	Company: AECOM	Date/Time: 7-23-18 1410	Received by:	Company: M.E.	Date/Time: 7/23/18 1410
Relinquished by:	Company: M.E.	Date/Time: 7/23/18 1435	Received by:	Company: TXPOR	Date/Time: 7/23/18 1435
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

8/3/2018

SUBSURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle
5755-8th Street East
Tacoma, WA 98424-1317
Ph: 253-922-2310 Fax: 253-922-5047

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:

Project Contact: Amy Dahl / Chelsey Cook
Tel: (206) 438-2261 / (206) 438-2010
Analysis Turnaround Time
Calendar (C) or Work Days (W) W
[x] 21 days
[ ] Other

Site Contact: Jennifer Ray / Michaela McCoog
Laboratory Contact: Elaine-Walker
Date: 7/23/18
Carrier: Courier
COC No: 3
1 of 1 pages

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	Afterberg Limits ASTM D4318	Sample Specific Notes:
PDI-SC-S036 - 0 to 1.4	7/20/2018	15:50	SC		ED	4		x	x	x	x		
PDI-SC-S036 - 1.4 to 3.4	7/20/2018	15:55	SC		ED	4		x	x	x	x		
PDI-SC-S036 - 3.4 to 5.2	7/20/2018	16:00	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 0 to 2	7/20/2018	13:30	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 2 to 4	7/20/2018	13:35	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 4 to 6	7/20/2018	13:40	SC		ED	4		x	x	x	x		
PDI-SC-S034 - 0 to 1.8	7/20/2018	11:45	SC		ED	4		x	x	x	x		
PDI-SC-S034 - 1.8 to 4	7/20/2018	11:50	SC		ED	5		x	x	x	x	x	
PDI-SC-S034 - 4 to 5.2	7/20/2018	11:55	SC		ED	4		x	x	x	x		
PDI-SC-S033 - 0 to 2	7/20/2018	17:40	SC		ED			x	x	x	x		
PDI-SC-S033 - 2 to 3	7/20/2018	17:45	SC		ED			x	x	x	x		
PDI-SC-S033 - 3 to 4	7/20/2018	17:50	SC		ED			x	x	x	x		
								AG	AG	WMG	WMG	AG	

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Colu
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

580-79057 Chain of Custody

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

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

24, 2-6

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	AECOM	7-23-18 1410	[signature]	M.E.	7/23/18 1410
[signature]	M.E.	7/23/18 1435	[signature]	TAPOR	7/23/18 1435
[signature]	TAPOR	7/24/18 1700	B Gall	SEA TA	7/24/18 0950

DR5 = 1.1 / 1.1 w/c.s.

Revised

SUBSURFACE SEDIMENT
CHAIN OF CUSTODY

Test America Seattle
5755-8th-Street-East
Tacoma, WA 98424-1317
Ph: 253-922-2310 Fax: 253-922-5047

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:

Project Contact: [illegible]
Tel: (206) 438-2261 / (206) 438-2010

Analysis Turnaround Time
Calendar (C) or Work Days (W) W
[x] 21 days
[ ] Other

Site Contact: Jennifer Ray / Michaela McCoog
Laboratory Contact: Elaine-Walker

Date: 7/23/18
Carrier: Courier

COC No: 3
1 of 1 pages

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-S036 - 0 to 1.4	7/20/2018	15:50	SC		ED	4		x	x	x	x		
PDI-SC-S036 - 1.4 to 3.4	7/20/2018	15:55	SC		ED	4		x	x	x	x		
PDI-SC-S036 - 3.4 to 5.2	7/20/2018	16:00	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 0 to 2	7/20/2018	13:30	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 2 to 4	7/20/2018	13:35	SC		ED	4		x	x	x	x		
PDI-SC-S022 - 4 to 6	7/20/2018	13:40	SC		ED	4		x	x	x	x		
~~PDI-SC-S034 - 0 to 1.8~~	~~7/20/2018~~	~~11:45~~	~~SC~~		~~ED~~	~~4~~		~~x~~	~~x~~	~~x~~	~~x~~		
PDI-SC-S034 - 1.8 to 4	7/20/2018	11:50	SC		ED	5		x	x	x	x	x	
PDI-SC-S034 - 4 to 5.2	7/20/2018	11:55	SC		ED	4		x	x	x	x		
PDI-SC-S033 - 0 to 2	7/20/2018	17:40	SC		ED			x	x	x	x		
PDI-SC-S033 - 2 to 3	7/20/2018	17:45	SC		ED			x	x	x	x		
~~PDI-SC-S033 - 3 to 4~~	~~7/20/2018~~	~~17:50~~	~~SC~~		~~ED~~			~~x~~	~~x~~	~~x~~	~~x~~		
								AG	AG	WMG	WMG	AG	

Per Aecom Already Received in earlier SDG

EN 7/24/18

580-79057 Chain of Custody

Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Colu

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**

204, 206

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Michael [signature]	AECOM	7-23-18 1410	[signature]	M.E.	7/23/18 1410
[signature]	M.E.	7/23/18 1435	[signature]	TAPOR	7/23/18 1435
[signature]	TAPOR	7/23/18 1700	B. Gall B. Gall	SEA TA	7/24/18 0950

IR5 = 1.1 / 1.1 w/c.s.

8/3/2018

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: 580-57347.1
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 #: 580-79057-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 8/8/2018			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605	PO #:			
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	WO #:			
Email:	Project #: 58012120			
Project Name: Portland Harbor Pre-Remedial Design	SSOW#:			
Site:				

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	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)	18135/HRMS_Sox_P (MOD) Full List w/o Totals	Archive freezer 7/23/18	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
PDI-SC-S036- 0 to 1.4 (580-79057-1)	7/20/18	15:50 Pacific		Solid			X	X	2	
PDI-SC-S036- 1.4 to 3.4 (580-79057-2)	7/20/18	15:55 Pacific		Solid			X	X	2	
PDI-SC-S036- 3.4 to 5.2 (580-79057-3)	7/20/18	16:00 Pacific		Solid			X	X	2	
PDI-SC-S022- 0 to 2 (580-79057-4)	7/20/18	13:30 Pacific		Solid			X	X	2	
PDI-SC-S022- 2 to 4 (580-79057-5)	7/20/18	13:35 Pacific		Solid			X	X	2	
PDI-SC-S022- 4 to 6 (580-79057-6)	7/20/18	13:40 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 compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ 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:	Time:	Method of Shipment:			
Relinquished by:	Date/Time: 7/23/18 1700	Company TAOR	Received by:	Date/Time: 7/24/18 900	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: ☑ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.5

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79057-2

Login Number: 79057
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: 580-79057-2

Login Number: 79057
List Number: 2
Creator: Gooch, Mayce

List Source: TestAmerica Sacramento
List Creation: 07/24/18 12:59 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.	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	2.5c
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

580-79057 Field Sheet

Job: —

Tracking # 4423 0760 7362 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 Y Wet Y Gel _____ Other _____

Cooler Custody Seal: Seal

Sample Custody Seal: —

Cooler ID: —

Temp: Observed 2.5

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: MM Date: 7/24/18 Time 900

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

F2 shelf G @ 1305

Isotope Dilution Summary

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

TestAmerica Job ID: 580-79057-2

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)
580-79057-1	PDI-SC-S036-0to1.4	42	38	42	50	51	50	50	55
580-79057-1 - RA	PDI-SC-S036-0to1.4								
580-79057-2	PDI-SC-S036-1.4to3.4	48	47	43	53	53	51	53	55
580-79057-2 - RA	PDI-SC-S036-1.4to3.4								
580-79057-3	PDI-SC-S036-3.4to5.2	53	49	34	64	77	61	74	67
580-79057-3 - RA	PDI-SC-S036-3.4to5.2								
580-79057-4	PDI-SC-S022-0to2	44	42	45	50	51	49	51	54
580-79057-5	PDI-SC-S022-2to4	47	45	50	51	52	51	52	56
580-79057-6	PDI-SC-S022-4to6	46	43	49	49	50	49	50	54
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)	
580-79057-1	PDI-SC-S036-0to1.4	55	57	52	60	62		33	
580-79057-1 - RA	PDI-SC-S036-0to1.4						73		
580-79057-2	PDI-SC-S036-1.4to3.4	54	55	54	55	56		43	
580-79057-2 - RA	PDI-SC-S036-1.4to3.4						58		
580-79057-3	PDI-SC-S036-3.4to5.2	72	67	66	66	68		46	
580-79057-3 - RA	PDI-SC-S036-3.4to5.2						93		
580-79057-4	PDI-SC-S022-0to2	53	55	54	56	59	64	36	
580-79057-5	PDI-SC-S022-2to4	52	55	54	57	59	63	39	
580-79057-6	PDI-SC-S022-4to6	50	52	52	53	57	60	37	
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

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

Isotope Dilution Summary

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

TestAmerica Job ID: 580-79057-2

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

Matrix: Solid

Prep Type: Total/NA

		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