TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-77770-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Karen Mixon

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Authorized for release by:
6/25/2018 4:16:23 PM

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Table of Contents

Job ID: 580-77770-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-77770-2

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

Thirteen samples were received on 6/4/2018 2:25 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 0.9º C, 1.3º C, 3.0º C and 3.4º C.

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

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

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

DIOXIN/ FURAN

Samples PDI-SG-B186-BL1 (580-77770-1), PDI-SG-B182-BL1 (580-77770-2), PDI-SG-B187-BL1 (580-77770-3), PDI-SG-B179-BL1 (580-77770-4), PDI-SG-B110-BL1 (580-77770-5), PDI-SG-B181-BL1 (580-77770-6), PDI-SG-B189-BL1 (580-77770-7), PDI-SG-B189-BL1-D (580-77770-8), PDI-SG-B316-BL1 (580-77770-9), PDI-SG-B317-BL1 (580-77770-10) and PDI-SG-B255-BL1 (580-77770-11) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/13/2018 and 06/14/2018 and analyzed on 06/20/2018, 06/21/2018 and 06/22/2018.

1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDF and 2,3,7,8-TCDF were detected in method blank MB 320-228869/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Several analytes were detected in method blank MB 320-229025/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The automated resolution check scheduled to be performed after the following samples did not complete due to a blown filament. Analyst replaced the filament with a new one and without tuning the instrument performed a manual ending resolution check. The ending resolution indicated the instrument maintained greater than 10,000 resolution. The delay in printing the ending resolution check has no impact on the data.
(LCS 320-228869/2-A), (LCSD 320-228869/3-A), (MB 320-228869/1-A) and (WDM 320-229749/3)

Job ID: 580-77770-2 (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 and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SG-B182-BL1 (580-77770-2), PDI-SG-B179-BL1 (580-77770-4), PDI-SG-B110-BL1 (580-77770-5), PDI-SG-B181-BL1 (580-77770-6), PDI-SG-B189-BL1 (580-77770-7), PDI-SG-B316-BL1 (580-77770-9), PDI-SG-B255-BL1 (580-77770-11), (CCV 320-230070/27), (CCV 320-230503/27), (CCV 320-229932/2) and (WDM 320-229932/1). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit: PDI-SG-B179-BL1 (580-77770-4). 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(s). All detection limits are below the lower calibration.

The following sample was diluted due to the sample matrix causing severe shifting with Isotope DIlution Analytes (IDA) and target compounds: PDI-SG-B182-BL1 (580-77770-2). Elevated reporting limits (RLs) are provided.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-B186-BL1 (580-77770-1), PDI-SG-B182-BL1 (580-77770-2), PDI-SG-B187-BL1 (580-77770-3), PDI-SG-B179-BL1 (580-77770-4), PDI-SG-B110-BL1 (580-77770-5), PDI-SG-B181-BL1 (580-77770-6), PDI-SG-B189-BL1 (580-77770-7), PDI-SG-B189-BL1-D (580-77770-8), PDI-SG-B316-BL1 (580-77770-9), PDI-SG-B317-BL1 (580-77770-10) and PDI-SG-B255-BL1 (580-77770-11). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-228869.

Samples PDI-SG-B182-BL1 (580-77770-2)[10X] and PDI-SG-B179-BL1 (580-77770-4)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

DIOXIN/ FURAN - Rinse Blank

Samples PDI-RB-VV-180602 (580-77770-12) and PDI-RB-VV-180603 (580-77770-13) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/07/2018 and analyzed on 06/11/2018.

Several analytes were detected in method blank MB 320-227727/1-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.

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

Qualifiers

Dioxin

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.
*	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-SG-B186-BL1

Date Collected: 06/01/18 16:22
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-1

Matrix: Solid
Percent Solids: 69.9

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	0.046	B	0.0036	0.00016	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,4,6,7,8-HpCDF	0.0066	B	0.0036	0.000053	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,4,7,8,9-HpCDF	0.0014	J B	0.0036	0.000060	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,4,7,8-HxCDD	0.00039	J B	0.0036	0.000021	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,4,7,8-HxCDF	0.0041	B	0.0036	0.000026	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,6,7,8-HxCDD	0.0013	J B	0.0036	0.000023	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,6,7,8-HxCDF	0.0011	J B	0.0036	0.000026	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,7,8,9-HxCDD	0.00079	J B	0.0036	0.000020	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,7,8,9-HxCDF	0.00052	J B	0.0036	0.000019	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,7,8-PeCDD	0.00016	J	0.0036	0.000025	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
1,2,3,7,8-PeCDF	0.0027	J B	0.0036	0.000044	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
2,3,4,6,7,8-HxCDF	0.00028	J B	0.0036	0.000021	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
2,3,4,7,8-PeCDF	0.00099	J B	0.0036	0.000049	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
2,3,7,8-TCDD	0.00016	J q B	0.00072	0.000022	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
OCDD	0.38	B	0.0072	0.00012	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1
OCDF	0.015	B	0.0072	0.000037	ug/Kg	☼	06/14/18 09:34	06/20/18 05:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*55*		*23 - 140*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*45*		*28 - 143*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*53*		*26 - 138*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,4,7,8-HxCDD	*67*		*32 - 141*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,4,7,8-HxCDF	*71*		*26 - 152*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,6,7,8-HxCDF	*64*		*26 - 123*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,7,8,9-HxCDF	*68*		*29 - 147*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,7,8-PeCDD	*66*		*25 - 181*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-2,3,4,6,7,8-HxCDF	*68*		*28 - 136*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-2,3,4,7,8-PeCDF	*67*		*21 - 178*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-2,3,7,8-TCDD	*61*		*25 - 164*	*06/14/18 09:34*	*06/20/18 05:29*	*1*
13C-OCDD	*61*		*17 - 157*	*06/14/18 09:34*	*06/20/18 05:29*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*110*		*35 - 197*	*06/14/18 09:34*	*06/20/18 05:29*	*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	0.0021	B	0.00072	0.000080	ug/Kg	☼	06/14/18 09:34	06/21/18 01:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*71*		*24 - 169*	*06/14/18 09:34*	*06/21/18 01:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*106*		*35 - 197*	*06/14/18 09:34*	*06/21/18 01:08*	*1*

Client Sample ID: PDI-SG-B182-BL1
Date Collected: 06/01/18 14:26
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-2
Matrix: Solid
Percent Solids: 47.6

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	1.0	B	0.051	0.013	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,4,6,7,8-HpCDF	0.10	B	0.051	0.0014	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,4,7,8,9-HpCDF	0.030	J B	0.051	0.0016	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,4,7,8-HxCDD	0.0025	J B	0.051	0.00045	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,4,7,8-HxCDF	0.10	B	0.051	0.0010	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,6,7,8-HxCDD	0.015	J B	0.051	0.00047	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,6,7,8-HxCDF	0.032	J B	0.051	0.0011	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,7,8,9-HxCDD	0.0090	J B	0.051	0.00043	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,7,8,9-HxCDF	0.0029	J B	0.051	0.00048	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,7,8-PeCDD	0.0017	J q	0.051	0.00067	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
1,2,3,7,8-PeCDF	0.083	B	0.051	0.00069	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
2,3,4,6,7,8-HxCDF	0.0055	J B	0.051	0.00082	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
2,3,4,7,8-PeCDF	0.038	J B	0.051	0.00082	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
2,3,7,8-TCDD	0.0039	J B	0.010	0.00054	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
OCDD	8.9	B	0.10	0.015	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10
OCDF	0.48	B	0.10	0.0010	ug/Kg	☼	06/14/18 09:34	06/22/18 16:11	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*35*		*23 - 140*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,4,6,7,8-HpCDF	*43*		*28 - 143*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,4,7,8,9-HpCDF	*45*		*26 - 138*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,4,7,8-HxCDD	*52*		*32 - 141*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,4,7,8-HxCDF	*53*		*26 - 152*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,6,7,8-HxCDD	*49*		*28 - 130*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,6,7,8-HxCDF	*52*		*26 - 123*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,7,8,9-HxCDF	*59*		*29 - 147*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,7,8-PeCDD	*59*		*25 - 181*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-1,2,3,7,8-PeCDF	*70*		*24 - 185*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-2,3,4,6,7,8-HxCDF	*40*		*28 - 136*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-2,3,4,7,8-PeCDF	*68*		*21 - 178*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*06/14/18 09:34*	*06/22/18 16:11*	*10*
13C-OCDD	*20*		*17 - 157*	*06/14/18 09:34*	*06/22/18 16:11*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*126*		*35 - 197*	*06/14/18 09:34*	*06/22/18 16:11*	*10*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.077	B	0.010	0.0015	ug/Kg	☼	06/14/18 09:34	06/20/18 23:52	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*116*		*24 - 169*	*06/14/18 09:34*	*06/20/18 23:52*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*179*		*35 - 197*	*06/14/18 09:34*	*06/20/18 23:52*	*10*

Client Sample ID: PDI-SG-B187-BL1
Date Collected: 06/01/18 16:20
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-3
Matrix: Solid
Percent Solids: 44.0

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	0.12	B	0.0056	0.00024	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,4,6,7,8-HpCDF	0.025	B	0.0056	0.00015	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,4,7,8,9-HpCDF	0.0055	J B	0.0056	0.00020	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,4,7,8-HxCDD	0.0016	J B	0.0056	0.000084	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,4,7,8-HxCDF	0.025	B	0.0056	0.00016	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,6,7,8-HxCDD	0.0094	B	0.0056	0.000096	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,6,7,8-HxCDF	0.0071	B	0.0056	0.00016	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,7,8,9-HxCDD	0.0043	J B	0.0056	0.000081	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,7,8,9-HxCDF	0.0015	J B	0.0056	0.00013	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,7,8-PeCDD	0.0011	J	0.0056	0.00013	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
1,2,3,7,8-PeCDF	0.020	B	0.0056	0.00018	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
2,3,4,6,7,8-HxCDF	0.0013	J B	0.0056	0.00013	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
2,3,4,7,8-PeCDF	0.0073	B	0.0056	0.00021	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
2,3,7,8-TCDD	0.00079	J B	0.0011	0.000054	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
OCDD	1.0	B	0.011	0.00023	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1
OCDF	0.045	B	0.011	0.000073	ug/Kg	☼	06/14/18 09:34	06/20/18 07:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*52*		*23 - 140*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*45*		*28 - 143*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*46*		*26 - 138*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,4,7,8-HxCDD	*77*		*32 - 141*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,4,7,8-HxCDF	*85*		*26 - 152*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,6,7,8-HxCDD	*53*		*28 - 130*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,6,7,8-HxCDF	*66*		*26 - 123*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,7,8,9-HxCDF	*62*		*29 - 147*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*25 - 181*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-2,3,4,6,7,8-HxCDF	*66*		*28 - 136*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*06/14/18 09:34*	*06/20/18 07:06*	*1*
13C-OCDD	*61*		*17 - 157*	*06/14/18 09:34*	*06/20/18 07:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*117*		*35 - 197*	*06/14/18 09:34*	*06/20/18 07:06*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.017	B	0.0011	0.00020	ug/Kg	☼	06/14/18 09:34	06/21/18 01:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*122*		*24 - 169*	*06/14/18 09:34*	*06/21/18 01:46*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*185*		*35 - 197*	*06/14/18 09:34*	*06/21/18 01:46*	*1*

Client Sample ID: PDI-SG-B179-BL1

Date Collected: 06/01/18 14:20
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-4

Matrix: Solid
Percent Solids: 42.1

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	0.63		0.060	0.0062	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,4,6,7,8-HpCDF	0.071		0.060	0.00089	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,4,7,8,9-HpCDF	0.015	J B	0.060	0.0012	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,4,7,8-HxCDD	0.0020	J	0.060	0.00066	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,4,7,8-HxCDF	0.054	J B	0.060	0.0012	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,6,7,8-HxCDD	0.010	J	0.060	0.00067	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,6,7,8-HxCDF	0.019	J	0.060	0.0013	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,7,8,9-HxCDD	0.0057	J	0.060	0.00062	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,7,8,9-HxCDF	0.0023	J B	0.060	0.00059	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,7,8-PeCDD	0.0017	J q	0.060	0.00059	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
1,2,3,7,8-PeCDF	0.032	J	0.060	0.00061	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
2,3,4,6,7,8-HxCDF	0.0031	J	0.060	0.0010	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
2,3,4,7,8-PeCDF	0.013	J	0.060	0.00069	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
2,3,7,8-TCDD	0.0019	J	0.012	0.00049	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
OCDD	4.2		0.12	0.0072	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10
OCDF	0.21		0.12	0.0029	ug/Kg	☼	06/13/18 12:12	06/22/18 16:57	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*16*	*	*23 - 140*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,4,6,7,8-HpCDF	*26*	*	*28 - 143*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,4,7,8,9-HpCDF	*24*	*	*26 - 138*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,4,7,8-HxCDD	*42*		*32 - 141*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,4,7,8-HxCDF	*48*		*26 - 152*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,6,7,8-HxCDD	*39*		*28 - 130*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,6,7,8-HxCDF	*46*		*26 - 123*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,7,8,9-HxCDF	*51*		*29 - 147*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,7,8-PeCDD	*56*		*25 - 181*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-2,3,4,6,7,8-HxCDF	*36*		*28 - 136*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-2,3,4,7,8-PeCDF	*57*		*21 - 178*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*06/13/18 12:12*	*06/22/18 16:57*	*10*
13C-OCDD	*5*	*	*17 - 157*	*06/13/18 12:12*	*06/22/18 16:57*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*124*		*35 - 197*	*06/13/18 12:12*	*06/22/18 16:57*	*10*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.024	B	0.012	0.0023	ug/Kg	☼	06/13/18 12:12	06/21/18 14:18	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*60*		*24 - 169*	*06/13/18 12:12*	*06/21/18 14:18*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*101*		*35 - 197*	*06/13/18 12:12*	*06/21/18 14:18*	*10*

Client Sample ID: PDI-SG-B110-BL1

Date Collected: 06/02/18 14:45
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-5

Matrix: Solid
Percent Solids: 74.4

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	0.061		0.0034	0.00046	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,4,6,7,8-HpCDF	0.011		0.0034	0.00019	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,4,7,8,9-HpCDF	0.00098	J B	0.0034	0.00021	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,4,7,8-HxCDD	0.00038	J	0.0034	0.000083	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,4,7,8-HxCDF	0.00096	J B	0.0034	0.000088	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,6,7,8-HxCDD	0.0018	J	0.0034	0.000079	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,6,7,8-HxCDF	0.00031	J q	0.0034	0.000091	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,7,8,9-HxCDD	0.00082	J	0.0034	0.000076	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,7,8,9-HxCDF	0.00056	J B	0.0034	0.000041	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,7,8-PeCDD	0.00017	J	0.0034	0.000037	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
1,2,3,7,8-PeCDF	0.00032	J	0.0034	0.000040	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
2,3,4,6,7,8-HxCDF	0.00025	J	0.0034	0.000060	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
2,3,4,7,8-PeCDF	0.00017	J	0.0034	0.000045	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
2,3,7,8-TCDD	0.000079	J q	0.00067	0.000024	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
2,3,7,8-TCDF	0.00023	J B	0.00067	0.000020	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
OCDD	0.43		0.0067	0.00058	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1
OCDF	0.047		0.0067	0.000040	ug/Kg	☼	06/13/18 12:12	06/20/18 19:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*48*		*23 - 140*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*52*		*28 - 143*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*59*		*26 - 138*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,4,7,8-HxCDD	*52*		*32 - 141*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,4,7,8-HxCDF	*50*		*26 - 152*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,6,7,8-HxCDD	*52*		*28 - 130*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,6,7,8-HxCDF	*48*		*26 - 123*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,7,8,9-HxCDF	*57*		*29 - 147*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,7,8-PeCDD	*55*		*25 - 181*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-2,3,4,6,7,8-HxCDF	*50*		*28 - 136*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-2,3,4,7,8-PeCDF	*65*		*21 - 178*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-2,3,7,8-TCDD	*61*		*25 - 164*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-2,3,7,8-TCDF	*71*		*24 - 169*	*06/13/18 12:12*	*06/20/18 19:43*	*1*
13C-OCDD	*42*		*17 - 157*	*06/13/18 12:12*	*06/20/18 19:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*122*		*35 - 197*	*06/13/18 12:12*	*06/20/18 19:43*	*1*

Client Sample ID: PDI-SG-B181-BL1
Date Collected: 06/02/18 09:55
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-6
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	0.078		0.0048	0.00083	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,4,6,7,8-HpCDF	0.017		0.0048	0.00016	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,4,7,8,9-HpCDF	0.0047	J B	0.0048	0.00017	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,4,7,8-HxCDD	0.00058	J	0.0048	0.000057	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,4,7,8-HxCDF	0.021	B	0.0048	0.00013	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,6,7,8-HxCDD	0.0021	J	0.0048	0.000055	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,6,7,8-HxCDF	0.0036	J	0.0048	0.00015	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,7,8,9-HxCDD	0.0015	J	0.0048	0.000052	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,7,8,9-HxCDF	0.00080	J B	0.0048	0.000067	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,7,8-PeCDD	0.00040	J	0.0048	0.000089	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
1,2,3,7,8-PeCDF	0.0047	J	0.0048	0.00011	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
2,3,4,6,7,8-HxCDF	0.00050	J	0.0048	0.00010	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
2,3,4,7,8-PeCDF	0.0020	J	0.0048	0.00012	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
2,3,7,8-TCDD	0.00037	J	0.00096	0.00014	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
OCDD	0.65		0.0096	0.00052	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1
OCDF	0.045		0.0096	0.000036	ug/Kg	☼	06/13/18 12:12	06/20/18 20:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*62*		*23 - 140*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*68*		*28 - 143*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*76*		*26 - 138*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,4,7,8-HxCDD	*64*		*32 - 141*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,4,7,8-HxCDF	*62*		*26 - 152*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,6,7,8-HxCDD	*61*		*28 - 130*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,7,8,9-HxCDF	*68*		*29 - 147*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,7,8-PeCDD	*64*		*25 - 181*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-1,2,3,7,8-PeCDF	*77*		*24 - 185*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-2,3,4,6,7,8-HxCDF	*60*		*28 - 136*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-2,3,4,7,8-PeCDF	*75*		*21 - 178*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-2,3,7,8-TCDD	*70*		*25 - 164*	*06/13/18 12:12*	*06/20/18 20:29*	*1*
13C-OCDD	*60*		*17 - 157*	*06/13/18 12:12*	*06/20/18 20:29*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*120*		*35 - 197*	*06/13/18 12:12*	*06/20/18 20:29*	*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	0.0061	B	0.00096	0.00021	ug/Kg	☼	06/13/18 12:12	06/22/18 01:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*76*		*24 - 169*	*06/13/18 12:12*	*06/22/18 01:37*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*107*		*35 - 197*	*06/13/18 12:12*	*06/22/18 01:37*	*1*

Client Sample ID: PDI-SG-B189-BL1
Date Collected: 06/02/18 10:19
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-7
Matrix: Solid
Percent Solids: 46.2

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.24		0.0053	0.0021	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,4,6,7,8-HpCDF	0.035		0.0053	0.00031	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,4,7,8,9-HpCDF	0.0063	B	0.0053	0.00032	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,4,7,8-HxCDD	0.00096	J	0.0053	0.00010	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,4,7,8-HxCDF	0.031	B	0.0053	0.00016	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,6,7,8-HxCDD	0.0043	J	0.0053	0.000099	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,6,7,8-HxCDF	0.0069		0.0053	0.00017	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,7,8,9-HxCDD	0.0026	J	0.0053	0.000095	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,7,8,9-HxCDF	0.0014	J B	0.0053	0.000082	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,7,8-PeCDD	0.00050	J	0.0053	0.000071	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
1,2,3,7,8-PeCDF	0.014		0.0053	0.00018	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
2,3,4,6,7,8-HxCDF	0.0012	J	0.0053	0.00012	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
2,3,4,7,8-PeCDF	0.0084		0.0053	0.00021	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
2,3,7,8-TCDD	0.00023	J q	0.0011	0.000049	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
OCDD	1.8		0.011	0.0019	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1
OCDF	0.10		0.011	0.000059	ug/Kg	☼	06/13/18 12:12	06/20/18 21:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*53*		*23 - 140*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*55*		*28 - 143*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*66*		*26 - 138*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,4,7,8-HxCDD	*54*		*32 - 141*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,4,7,8-HxCDF	*52*		*26 - 152*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,6,7,8-HxCDD	*50*		*28 - 130*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,6,7,8-HxCDF	*48*		*26 - 123*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,7,8,9-HxCDF	*57*		*29 - 147*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,7,8-PeCDD	*54*		*25 - 181*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-2,3,4,6,7,8-HxCDF	*51*		*28 - 136*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-2,3,4,7,8-PeCDF	*63*		*21 - 178*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-2,3,7,8-TCDD	*59*		*25 - 164*	*06/13/18 12:12*	*06/20/18 21:15*	*1*
13C-OCDD	*51*		*17 - 157*	*06/13/18 12:12*	*06/20/18 21:15*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*120*		*35 - 197*	*06/13/18 12:12*	*06/20/18 21:15*	*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	0.0011	0.00032	ug/Kg	☼	06/13/18 12:12	06/22/18 02:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*06/13/18 12:12*	*06/22/18 02:15*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*108*		*35 - 197*	*06/13/18 12:12*	*06/22/18 02:15*	*1*

Client Sample ID: PDI-SG-B189-BL1-D
Date Collected: 06/02/18 10:20
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-8
Matrix: Solid
Percent Solids: 45.6

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.10	B	0.0054	0.00026	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,4,6,7,8-HpCDF	0.035	B	0.0054	0.00019	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,4,7,8,9-HpCDF	0.0097	B	0.0054	0.00018	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,4,7,8-HxCDD	0.00093	J B	0.0054	0.000043	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,4,7,8-HxCDF	0.060	B	0.0054	0.00012	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,6,7,8-HxCDD	0.0033	J B	0.0054	0.000043	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,6,7,8-HxCDF	0.013	B	0.0054	0.00011	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,7,8,9-HxCDD	0.0025	J B	0.0054	0.000038	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,7,8,9-HxCDF	0.0013	J B	0.0054	0.000080	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,7,8-PeCDD	0.00043	J	0.0054	0.000084	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
1,2,3,7,8-PeCDF	0.023	B	0.0054	0.00018	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
2,3,4,6,7,8-HxCDF	0.0020	J B	0.0054	0.000089	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
2,3,4,7,8-PeCDF	0.0091	B	0.0054	0.00021	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
2,3,7,8-TCDD	0.00034	J q B	0.0011	0.000042	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
OCDD	0.84	B	0.011	0.00019	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1
OCDF	0.063	B	0.011	0.000048	ug/Kg	☼	06/14/18 09:34	06/20/18 07:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*54*		*23 - 140*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*38*		*28 - 143*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*52*		*26 - 138*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,4,7,8-HxCDD	*70*		*32 - 141*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,4,7,8-HxCDF	*68*		*26 - 152*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,6,7,8-HxCDF	*61*		*26 - 123*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,7,8,9-HxCDF	*68*		*29 - 147*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,7,8-PeCDD	*66*		*25 - 181*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-1,2,3,7,8-PeCDF	*65*		*24 - 185*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-2,3,4,6,7,8-HxCDF	*67*		*28 - 136*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-2,3,4,7,8-PeCDF	*65*		*21 - 178*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-2,3,7,8-TCDD	*61*		*25 - 164*	*06/14/18 09:34*	*06/20/18 07:54*	*1*
13C-OCDD	*62*		*17 - 157*	*06/14/18 09:34*	*06/20/18 07:54*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*109*		*35 - 197*	*06/14/18 09:34*	*06/20/18 07:54*	*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	0.024	B	0.0011	0.00021	ug/Kg	☼	06/14/18 09:34	06/21/18 02:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*69*		*24 - 169*	*06/14/18 09:34*	*06/21/18 02:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*108*		*35 - 197*	*06/14/18 09:34*	*06/21/18 02:23*	*1*

Client Sample ID: PDI-SG-B316-BL1
Date Collected: 06/02/18 14:34
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-9
Matrix: Solid
Percent Solids: 40.4

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	0.10		0.0061	0.0013	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,4,6,7,8-HpCDF	0.011	q	0.0061	0.00049	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,4,7,8,9-HpCDF	0.0014	J B	0.0061	0.00048	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,4,7,8-HxCDD	0.00087	J	0.0061	0.00012	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,4,7,8-HxCDF	0.0013	J B	0.0061	0.00014	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,6,7,8-HxCDD	0.0024	J	0.0061	0.00011	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,6,7,8-HxCDF	0.00060	J	0.0061	0.00016	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,7,8,9-HxCDD	0.0019	J	0.0061	0.00011	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,7,8,9-HxCDF	0.0011	J B	0.0061	0.000072	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,7,8-PeCDD	0.00049	J	0.0061	0.000087	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
1,2,3,7,8-PeCDF	0.00054	J	0.0061	0.000067	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
2,3,4,6,7,8-HxCDF	0.00039	J q	0.0061	0.00011	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
2,3,4,7,8-PeCDF	0.00045	J	0.0061	0.000071	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
2,3,7,8-TCDD	0.00030	J q	0.0012	0.000056	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
2,3,7,8-TCDF	0.00089	J B	0.0012	0.000055	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
OCDD	0.74		0.012	0.00053	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1
OCDF	0.047		0.012	0.000071	ug/Kg	☼	06/13/18 12:12	06/20/18 22:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*52*		*23 - 140*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*55*		*28 - 143*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*65*		*26 - 138*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,4,7,8-HxCDD	*53*		*32 - 141*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,4,7,8-HxCDF	*53*		*26 - 152*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,6,7,8-HxCDD	*53*		*28 - 130*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,6,7,8-HxCDF	*50*		*26 - 123*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,7,8,9-HxCDF	*58*		*29 - 147*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,7,8-PeCDD	*56*		*25 - 181*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-1,2,3,7,8-PeCDF	*66*		*24 - 185*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-2,3,4,6,7,8-HxCDF	*51*		*28 - 136*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-2,3,7,8-TCDF	*75*		*24 - 169*	*06/13/18 12:12*	*06/20/18 22:01*	*1*
13C-OCDD	*49*		*17 - 157*	*06/13/18 12:12*	*06/20/18 22:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*122*		*35 - 197*	*06/13/18 12:12*	*06/20/18 22:01*	*1*

Client Sample ID: PDI-SG-B317-BL1

Date Collected: 06/03/18 09:05
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-10

Matrix: Solid
Percent Solids: 41.5

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	0.16	B	0.0060	0.00050	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,4,6,7,8-HpCDF	0.015	B	0.0060	0.00026	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,4,7,8,9-HpCDF	0.0016	J B	0.0060	0.00019	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,4,7,8-HxCDD	0.0011	J B q	0.0060	0.000042	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,4,7,8-HxCDF	0.0016	J B	0.0060	0.000098	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,6,7,8-HxCDD	0.0036	J B q	0.0060	0.000043	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,6,7,8-HxCDF	0.00072	J B	0.0060	0.000093	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,7,8,9-HxCDD	0.0028	J B	0.0060	0.000038	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,7,8,9-HxCDF	0.00064	J B	0.0060	0.000064	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,7,8-PeCDD	0.00050	J	0.0060	0.000073	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
1,2,3,7,8-PeCDF	0.00066	J B	0.0060	0.000079	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
2,3,4,6,7,8-HxCDF	0.00056	J B	0.0060	0.000066	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
2,3,4,7,8-PeCDF	0.00086	J B	0.0060	0.000090	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
2,3,7,8-TCDD	0.00046	J B	0.0012	0.000034	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
OCDD	1.1	B	0.012	0.00022	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1
OCDF	0.037	B	0.012	0.000048	ug/Kg	☼	06/14/18 09:34	06/20/18 08:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*54*		*23 - 140*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*34*		*28 - 143*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*54*		*26 - 138*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,4,7,8-HxCDD	*65*		*32 - 141*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,4,7,8-HxCDF	*65*		*26 - 152*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,6,7,8-HxCDD	*56*		*28 - 130*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,7,8,9-HxCDF	*65*		*29 - 147*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,7,8-PeCDD	*60*		*25 - 181*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-1,2,3,7,8-PeCDF	*60*		*24 - 185*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-2,3,4,6,7,8-HxCDF	*65*		*28 - 136*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-2,3,4,7,8-PeCDF	*61*		*21 - 178*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-2,3,7,8-TCDD	*57*		*25 - 164*	*06/14/18 09:34*	*06/20/18 08:42*	*1*
13C-OCDD	*58*		*17 - 157*	*06/14/18 09:34*	*06/20/18 08:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*106*		*35 - 197*	*06/14/18 09:34*	*06/20/18 08:42*	*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	0.0013	B	0.0012	0.00014	ug/Kg	☼	06/14/18 09:34	06/21/18 03:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*66*		*24 - 169*	*06/14/18 09:34*	*06/21/18 03:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*100*		*35 - 197*	*06/14/18 09:34*	*06/21/18 03:01*	*1*

Client Sample ID: PDI-SG-B255-BL1
Date Collected: 06/03/18 09:55
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-11
Matrix: Solid
Percent Solids: 42.2

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.23		0.0059	0.0015	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,4,6,7,8-HpCDF	0.036		0.0059	0.00049	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,4,7,8,9-HpCDF	0.0034	J B	0.0059	0.00052	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,4,7,8-HxCDD	0.0019	J	0.0059	0.00014	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,4,7,8-HxCDF	0.0031	J B	0.0059	0.00027	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,6,7,8-HxCDD	0.0071		0.0059	0.00013	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,6,7,8-HxCDF	0.0017	J	0.0059	0.00029	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,7,8,9-HxCDD	0.0047	J	0.0059	0.00013	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,7,8,9-HxCDF	0.0013	J B	0.0059	0.00013	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,7,8-PeCDD	0.0012	J	0.0059	0.00012	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
1,2,3,7,8-PeCDF	0.00076	J q	0.0059	0.00019	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
2,3,4,6,7,8-HxCDF	0.00075	J q	0.0059	0.00019	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
2,3,4,7,8-PeCDF	0.00066	J q	0.0059	0.00020	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
2,3,7,8-TCDD	0.00062	J q	0.0012	0.000065	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
OCDD	2.1		0.012	0.0012	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1
OCDF	0.16		0.012	0.000081	ug/Kg	☼	06/13/18 12:12	06/20/18 22:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*43*		*23 - 140*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*47*		*28 - 143*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*52*		*26 - 138*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,4,7,8-HxCDD	*47*		*32 - 141*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,4,7,8-HxCDF	*46*		*26 - 152*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,6,7,8-HxCDD	*46*		*28 - 130*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,6,7,8-HxCDF	*43*		*26 - 123*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,7,8,9-HxCDF	*52*		*29 - 147*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,7,8-PeCDD	*50*		*25 - 181*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-1,2,3,7,8-PeCDF	*59*		*24 - 185*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-2,3,4,6,7,8-HxCDF	*45*		*28 - 136*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-2,3,4,7,8-PeCDF	*61*		*21 - 178*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-2,3,7,8-TCDD	*57*		*25 - 164*	*06/13/18 12:12*	*06/20/18 22:47*	*1*
13C-OCDD	*39*		*17 - 157*	*06/13/18 12:12*	*06/20/18 22:47*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*119*		*35 - 197*	*06/13/18 12:12*	*06/20/18 22:47*	*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	0.0032	B	0.0012	0.00027	ug/Kg	☼	06/13/18 12:12	06/22/18 02:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*63*		*24 - 169*	*06/13/18 12:12*	*06/22/18 02:53*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*06/13/18 12:12*	*06/22/18 02:53*	*1*

Client Sample ID: PDI-RB-VV-180602

Date Collected: 06/02/18 15:30
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-12

Matrix: Water

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	2.4	J q B	48	0.14	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,4,6,7,8-HpCDF	1.2	J q B	48	0.21	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,4,7,8,9-HpCDF	1.6	J B	48	0.26	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,4,7,8-HxCDD	1.6	J B	48	0.30	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,4,7,8-HxCDF	0.41	J q	48	0.39	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,6,7,8-HxCDD	0.79	J q B	48	0.28	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,6,7,8-HxCDF	ND		48	0.40	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,7,8,9-HxCDD	0.65	J q B	48	0.27	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,7,8,9-HxCDF	2.8	J B	48	0.18	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,7,8-PeCDD	0.37	J q	48	0.32	pg/L		06/07/18 08:17	06/11/18 19:44	1
1,2,3,7,8-PeCDF	0.97	J	48	0.29	pg/L		06/07/18 08:17	06/11/18 19:44	1
2,3,4,6,7,8-HxCDF	0.36	J q B	48	0.22	pg/L		06/07/18 08:17	06/11/18 19:44	1
2,3,4,7,8-PeCDF	ND		48	0.35	pg/L		06/07/18 08:17	06/11/18 19:44	1
2,3,7,8-TCDD	0.42	J q	9.5	0.22	pg/L		06/07/18 08:17	06/11/18 19:44	1
2,3,7,8-TCDF	1.7	J B	9.5	0.13	pg/L		06/07/18 08:17	06/11/18 19:44	1
OCDD	20	J B	95	0.31	pg/L		06/07/18 08:17	06/11/18 19:44	1
OCDF	4.2	J B	95	0.23	pg/L		06/07/18 08:17	06/11/18 19:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*60*		*23 - 140*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*66*		*28 - 143*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*64*		*26 - 138*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,4,7,8-HxCDD	*60*		*32 - 141*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,4,7,8-HxCDF	*60*		*26 - 152*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,6,7,8-HxCDD	*65*		*28 - 130*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,6,7,8-HxCDF	*63*		*26 - 123*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,7,8,9-HxCDF	*70*		*29 - 147*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,7,8-PeCDD	*65*		*25 - 181*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-1,2,3,7,8-PeCDF	*73*		*24 - 185*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-2,3,4,6,7,8-HxCDF	*67*		*28 - 136*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-2,3,4,7,8-PeCDF	*67*		*21 - 178*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-2,3,7,8-TCDD	*76*		*25 - 164*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-2,3,7,8-TCDF	*81*		*24 - 169*	*06/07/18 08:17*	*06/11/18 19:44*	*1*
13C-OCDD	*48*		*17 - 157*	*06/07/18 08:17*	*06/11/18 19:44*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*113*		*35 - 197*	*06/07/18 08:17*	*06/11/18 19:44*	*1*

Client Sample ID: PDI-RB-VV-180603

Date Collected: 06/03/18 12:10
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-13

Matrix: Water

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	**3.0**	**J B**	50	0.19	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,4,6,7,8-HpCDF	**0.85**	**J q B**	50	0.27	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,4,7,8,9-HpCDF	**1.6**	**J B**	50	0.33	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,4,7,8-HxCDD	**1.2**	**J q B**	50	0.34	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,4,7,8-HxCDF	ND		50	0.43	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,6,7,8-HxCDD	ND		50	0.30	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,6,7,8-HxCDF	ND		50	0.44	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,7,8,9-HxCDD	ND		50	0.30	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,7,8,9-HxCDF	**2.6**	**J q B**	50	0.21	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,7,8-PeCDD	ND		50	0.31	pg/L		06/07/18 08:17	06/11/18 20:30	1
1,2,3,7,8-PeCDF	**0.98**	**J q**	50	0.29	pg/L		06/07/18 08:17	06/11/18 20:30	1
2,3,4,6,7,8-HxCDF	ND		50	0.23	pg/L		06/07/18 08:17	06/11/18 20:30	1
2,3,4,7,8-PeCDF	ND		50	0.35	pg/L		06/07/18 08:17	06/11/18 20:30	1
2,3,7,8-TCDD	**1.7**	**J q**	9.9	0.22	pg/L		06/07/18 08:17	06/11/18 20:30	1
2,3,7,8-TCDF	**1.2**	**J B**	9.9	0.15	pg/L		06/07/18 08:17	06/11/18 20:30	1
OCDD	**16**	**J B**	99	0.27	pg/L		06/07/18 08:17	06/11/18 20:30	1
OCDF	**3.0**	**J B**	99	0.24	pg/L		06/07/18 08:17	06/11/18 20:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*57*		*23 - 140*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*65*		*28 - 143*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*67*		*26 - 138*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,4,7,8-HxCDD	*56*		*32 - 141*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,4,7,8-HxCDF	*56*		*26 - 152*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,6,7,8-HxCDD	*64*		*28 - 130*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,6,7,8-HxCDF	*59*		*26 - 123*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,7,8,9-HxCDF	*68*		*29 - 147*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,7,8-PeCDD	*63*		*25 - 181*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-1,2,3,7,8-PeCDF	*73*		*24 - 185*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-2,3,4,6,7,8-HxCDF	*66*		*28 - 136*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-2,3,4,7,8-PeCDF	*64*		*21 - 178*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-2,3,7,8-TCDD	*76*		*25 - 164*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-2,3,7,8-TCDF	*80*		*24 - 169*	*06/07/18 08:17*	*06/11/18 20:30*	*1*
13C-OCDD	*45*		*17 - 157*	*06/07/18 08:17*	*06/11/18 20:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*06/07/18 08:17*	*06/11/18 20:30*	*1*

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

Lab Sample ID: MB 320-227727/1-A
Matrix: Water
Analysis Batch: 228657

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 227727

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	3.66	J	50	0.22	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,4,6,7,8-HpCDF	2.21	J q	50	0.24	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,4,7,8,9-HpCDF	3.35	J	50	0.30	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,4,7,8-HxCDD	1.61	J q	50	0.37	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,4,7,8-HxCDF	ND		50	0.46	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,6,7,8-HxCDD	0.920	J	50	0.35	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,6,7,8-HxCDF	ND		50	0.48	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,7,8,9-HxCDD	1.13	J q	50	0.34	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,7,8,9-HxCDF	3.12	J	50	0.25	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,7,8-PeCDD	ND		50	0.43	pg/L		06/07/18 08:17	06/11/18 13:36	1
1,2,3,7,8-PeCDF	ND		50	0.31	pg/L		06/07/18 08:17	06/11/18 13:36	1
2,3,4,6,7,8-HxCDF	0.889	J q	50	0.29	pg/L		06/07/18 08:17	06/11/18 13:36	1
2,3,4,7,8-PeCDF	ND		50	0.35	pg/L		06/07/18 08:17	06/11/18 13:36	1
2,3,7,8-TCDD	ND		10	0.29	pg/L		06/07/18 08:17	06/11/18 13:36	1
2,3,7,8-TCDF	0.976	J q	10	0.19	pg/L		06/07/18 08:17	06/11/18 13:36	1
OCDD	14.5	J	100	0.27	pg/L		06/07/18 08:17	06/11/18 13:36	1
OCDF	8.46	J	100	0.34	pg/L		06/07/18 08:17	06/11/18 13:36	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*65*		*23 - 140*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*73*		*28 - 143*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*67*		*26 - 138*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,4,7,8-HxCDD	*73*		*32 - 141*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,4,7,8-HxCDF	*70*		*26 - 152*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,6,7,8-HxCDD	*75*		*28 - 130*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,6,7,8-HxCDF	*72*		*26 - 123*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,7,8,9-HxCDF	*75*		*29 - 147*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,7,8-PeCDD	*71*		*25 - 181*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-1,2,3,7,8-PeCDF	*80*		*24 - 185*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-2,3,4,6,7,8-HxCDF	*73*		*28 - 136*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-2,3,4,7,8-PeCDF	*79*		*21 - 178*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-2,3,7,8-TCDD	*83*		*25 - 164*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-2,3,7,8-TCDF	*88*		*24 - 169*	*06/07/18 08:17*	*06/11/18 13:36*	*1*
13C-OCDD	*49*		*17 - 157*	*06/07/18 08:17*	*06/11/18 13:36*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*122*		*35 - 197*	*06/07/18 08:17*	*06/11/18 13:36*	*1*

Lab Sample ID: LCS 320-227727/2-A
Matrix: Water
Analysis Batch: 228657

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 227727

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	1000	1030		pg/L		103	70 - 140
1,2,3,4,6,7,8-HpCDF	1000	958		pg/L		96	82 - 122
1,2,3,4,7,8,9-HpCDF	1000	954		pg/L		95	78 - 138
1,2,3,4,7,8-HxCDD	1000	958		pg/L		96	70 - 164
1,2,3,4,7,8-HxCDF	1000	971		pg/L		97	72 - 134

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

Lab Sample ID: LCS 320-227727/2-A
Matrix: Water
Analysis Batch: 228657

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 227727

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2,3,6,7,8-HxCDD			1000	940		pg/L		94	76 - 134		
1,2,3,6,7,8-HxCDF			1000	1000		pg/L		100	84 - 130		
1,2,3,7,8,9-HxCDD			1000	1050		pg/L		105	64 - 162		
1,2,3,7,8,9-HxCDF			1000	990		pg/L		99	78 - 130		
1,2,3,7,8-PeCDD			1000	1090		pg/L		109	70 - 142		
1,2,3,7,8-PeCDF			1000	963		pg/L		96	80 - 134		
2,3,4,6,7,8-HxCDF			1000	970		pg/L		97	70 - 156		
2,3,4,7,8-PeCDF			1000	963		pg/L		96	68 - 160		
2,3,7,8-TCDD			200	196		pg/L		98	67 - 158		
2,3,7,8-TCDF			200	181		pg/L		91	75 - 158		
OCDD			2000	2090		pg/L		105	78 - 144		
OCDF			2000	2120		pg/L		106	63 - 170		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*61*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*67*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*67*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*65*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*65*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*69*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*66*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*71*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*69*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*80*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*69*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*75*		*13 - 328*
13C-2,3,7,8-TCDD	*82*		*20 - 175*
13C-2,3,7,8-TCDF	*87*		*22 - 152*
13C-OCDD	*48*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*112*		*31 - 191*

Lab Sample ID: LCSD 320-227727/3-A
Matrix: Water
Analysis Batch: 228657

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 227727

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD			1000	1060		pg/L		106	70 - 140	4	50
1,2,3,4,6,7,8-HpCDF			1000	965		pg/L		97	82 - 122	1	50
1,2,3,4,7,8,9-HpCDF			1000	961		pg/L		96	78 - 138	1	50
1,2,3,4,7,8-HxCDD			1000	965		pg/L		96	70 - 164	1	50
1,2,3,4,7,8-HxCDF			1000	984		pg/L		98	72 - 134	1	50
1,2,3,6,7,8-HxCDD			1000	960		pg/L		96	76 - 134	2	50
1,2,3,6,7,8-HxCDF			1000	1010		pg/L		101	84 - 130	1	50
1,2,3,7,8,9-HxCDD			1000	1080		pg/L		108	64 - 162	3	50
1,2,3,7,8,9-HxCDF			1000	982		pg/L		98	78 - 130	1	50
1,2,3,7,8-PeCDD			1000	1080		pg/L		108	70 - 142	0	50

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

Lab Sample ID: LCSD 320-227727/3-A
Matrix: Water
Analysis Batch: 228657

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 227727

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			1000	973		pg/L		97	80 - 134	1	50
2,3,4,6,7,8-HxCDF			1000	995		pg/L		100	70 - 156	3	50
2,3,4,7,8-PeCDF			1000	970		pg/L		97	68 - 160	1	50
2,3,7,8-TCDD			200	196		pg/L		98	67 - 158	0	50
2,3,7,8-TCDF			200	179		pg/L		89	75 - 158	1	50
OCDD			2000	2080		pg/L		104	78 - 144	1	50
OCDF			2000	2110		pg/L		105	63 - 170	1	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*52*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*61*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*60*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*57*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*56*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*59*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*58*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*64*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*61*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*70*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*61*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*66*		*13 - 328*
13C-2,3,7,8-TCDD	*75*		*20 - 175*
13C-2,3,7,8-TCDF	*80*		*22 - 152*
13C-OCDD	*43*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*107*		*31 - 191*

Lab Sample ID: MB 320-228869/1-A
Matrix: Solid
Analysis Batch: 229749

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 228869

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

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

Lab Sample ID: MB 320-228869/1-A
Matrix: Solid
Analysis Batch: 229749

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 228869

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
OCDD	ND		0.010	0.00013	ug/Kg		06/13/18 12:12	06/19/18 06:05	1
OCDF	ND		0.010	0.00021	ug/Kg		06/13/18 12:12	06/19/18 06:05	1

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

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

Lab Sample ID: LCS 320-228869/2-A
Matrix: Solid
Analysis Batch: 229749

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228869

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.112		ug/Kg		112	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.114		ug/Kg		114	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.113		ug/Kg		113	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.112		ug/Kg		112	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.113		ug/Kg		113	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.104		ug/Kg		104	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.116		ug/Kg		116	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.107		ug/Kg		107	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.110		ug/Kg		110	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0907		ug/Kg		91	70 - 142
1,2,3,7,8-PeCDF	0.100	0.118		ug/Kg		118	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.116		ug/Kg		116	70 - 156
2,3,4,7,8-PeCDF	0.100	0.118		ug/Kg		118	68 - 160
2,3,7,8-TCDD	0.0200	0.0235		ug/Kg		118	67 - 158
2,3,7,8-TCDF	0.0200	0.0230		ug/Kg		115	75 - 158
OCDD	0.200	0.187		ug/Kg		94	78 - 144
OCDF	0.200	0.205		ug/Kg		102	63 - 170

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*58*		*26 - 166*

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

Lab Sample ID: LCS 320-228869/2-A
Matrix: Solid
Analysis Batch: 229749

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228869

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

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

Lab Sample ID: LCSD 320-228869/3-A
Matrix: Solid
Analysis Batch: 229749

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228869

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,4,6,7,8-HpCDD			0.100	0.107		ug/Kg		107	70 - 140	5	50
1,2,3,4,6,7,8-HpCDF			0.100	0.110		ug/Kg		110	82 - 122	4	50
1,2,3,4,7,8,9-HpCDF			0.100	0.110		ug/Kg		110	78 - 138	2	50
1,2,3,4,7,8-HxCDD			0.100	0.107		ug/Kg		107	70 - 164	4	50
1,2,3,4,7,8-HxCDF			0.100	0.112		ug/Kg		112	72 - 134	2	50
1,2,3,6,7,8-HxCDD			0.100	0.103		ug/Kg		103	76 - 134	1	50
1,2,3,6,7,8-HxCDF			0.100	0.118		ug/Kg		118	84 - 130	2	50
1,2,3,7,8,9-HxCDD			0.100	0.106		ug/Kg		106	64 - 162	1	50
1,2,3,7,8,9-HxCDF			0.100	0.114		ug/Kg		114	78 - 130	4	50
1,2,3,7,8-PeCDD			0.100	0.0882		ug/Kg		88	70 - 142	3	50
1,2,3,7,8-PeCDF			0.100	0.115		ug/Kg		115	80 - 134	3	50
2,3,4,6,7,8-HxCDF			0.100	0.113		ug/Kg		113	70 - 156	3	50
2,3,4,7,8-PeCDF			0.100	0.118		ug/Kg		118	68 - 160	0	50
2,3,7,8-TCDD			0.0200	0.0237		ug/Kg		119	67 - 158	1	50
2,3,7,8-TCDF			0.0200	0.0227		ug/Kg		114	75 - 158	1	50
OCDD			0.200	0.186		ug/Kg		93	78 - 144	1	50
OCDF			0.200	0.206		ug/Kg		103	63 - 170	0	50

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	62		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	68		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	64		20 - 186
13C-1,2,3,4,7,8-HxCDD	68		21 - 193
13C-1,2,3,4,7,8-HxCDF	78		19 - 202
13C-1,2,3,6,7,8-HxCDD	72		25 - 163

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

Lab Sample ID: LCSD 320-228869/3-A
Matrix: Solid
Analysis Batch: 229749

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228869

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,6,7,8-HxCDF	76		21 - 159
13C-1,2,3,7,8,9-HxCDF	74		17 - 205
13C-1,2,3,7,8-PeCDD	76		21 - 227
13C-1,2,3,7,8-PeCDF	67		21 - 192
13C-2,3,4,6,7,8-HxCDF	78		22 - 176
13C-2,3,4,7,8-PeCDF	65		13 - 328
13C-2,3,7,8-TCDD	65		20 - 175
13C-2,3,7,8-TCDF	70		22 - 152
13C-OCDD	71		13 - 199

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

Lab Sample ID: MB 320-229025/1-A
Matrix: Solid
Analysis Batch: 229940

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 229025

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.0000946	J q	0.0050	0.000015	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,6,7,8-HpCDF	0.000140	J	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,7,8,9-HpCDF	0.000579	J	0.0050	0.000021	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,7,8-HxCDD	0.000140	J	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,4,7,8-HxCDF	0.000102	J	0.0050	0.000026	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,6,7,8-HxCDD	0.0000407	J	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,6,7,8-HxCDF	0.0000470	J q	0.0050	0.000024	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8,9-HxCDD	0.0000275	J q	0.0050	0.000016	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8,9-HxCDF	0.000599	J	0.0050	0.000017	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8-PeCDD	ND		0.0050	0.000025	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
1,2,3,7,8-PeCDF	0.0000769	J q	0.0050	0.000019	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,4,6,7,8-HxCDF	0.0000312	J q	0.0050	0.000018	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,4,7,8-PeCDF	0.0000360	J q	0.0050	0.000021	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,7,8-TCDD	0.0000987	J q	0.0010	0.000023	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
2,3,7,8-TCDF	0.000152	J	0.0010	0.000017	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
OCDD	0.000338	J q	0.010	0.000016	ug/Kg		06/14/18 09:34	06/20/18 01:27	1
OCDF	0.000280	J q	0.010	0.000024	ug/Kg		06/14/18 09:34	06/20/18 01:27	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	64		23 - 140	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,6,7,8-HpCDF	61		28 - 143	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,7,8,9-HpCDF	64		26 - 138	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,7,8-HxCDD	72		32 - 141	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,4,7,8-HxCDF	72		26 - 152	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,6,7,8-HxCDD	64		28 - 130	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,6,7,8-HxCDF	65		26 - 123	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,7,8,9-HxCDF	71		29 - 147	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,7,8-PeCDD	71		25 - 181	06/14/18 09:34	06/20/18 01:27	1
13C-1,2,3,7,8-PeCDF	70		24 - 185	06/14/18 09:34	06/20/18 01:27	1
13C-2,3,4,6,7,8-HxCDF	71		28 - 136	06/14/18 09:34	06/20/18 01:27	1

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

Lab Sample ID: MB 320-229025/1-A
Matrix: Solid
Analysis Batch: 229940

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 229025

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-2,3,4,7,8-PeCDF	68		21 - 178	06/14/18 09:34	06/20/18 01:27	1
13C-2,3,7,8-TCDD	65		25 - 164	06/14/18 09:34	06/20/18 01:27	1
13C-2,3,7,8-TCDF	73		24 - 169	06/14/18 09:34	06/20/18 01:27	1
13C-OCDD	67		17 - 157	06/14/18 09:34	06/20/18 01:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	109		35 - 197	06/14/18 09:34	06/20/18 01:27	1

Lab Sample ID: LCS 320-229025/2-A
Matrix: Solid
Analysis Batch: 229940

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 229025

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.101		ug/Kg		101	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.104		ug/Kg		104	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.102		ug/Kg		102	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.0995		ug/Kg		99	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.100		ug/Kg		100	72 - 134
1,2,3,6,7,8-HxCDD	0.100	0.0999		ug/Kg		100	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.102		ug/Kg		102	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.105		ug/Kg		105	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.100		ug/Kg		100	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0981		ug/Kg		98	70 - 142
1,2,3,7,8-PeCDF	0.100	0.101		ug/Kg		101	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.0996		ug/Kg		100	70 - 156
2,3,4,7,8-PeCDF	0.100	0.102		ug/Kg		102	68 - 160
2,3,7,8-TCDD	0.0200	0.0202		ug/Kg		101	67 - 158
2,3,7,8-TCDF	0.0200	0.0198		ug/Kg		99	75 - 158
OCDD	0.200	0.189		ug/Kg		94	78 - 144
OCDF	0.200	0.176		ug/Kg		88	63 - 170

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

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

Lab Sample ID: LCS 320-229025/2-A
Matrix: Solid
Analysis Batch: 229940

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 229025

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

Lab Sample ID: LCSD 320-229025/3-A
Matrix: Solid
Analysis Batch: 229940

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 229025

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

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	71		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	65		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	70		20 - 186
13C-1,2,3,4,7,8-HxCDD	74		21 - 193
13C-1,2,3,4,7,8-HxCDF	74		19 - 202
13C-1,2,3,6,7,8-HxCDD	63		25 - 163
13C-1,2,3,6,7,8-HxCDF	67		21 - 159
13C-1,2,3,7,8,9-HxCDF	73		17 - 205
13C-1,2,3,7,8-PeCDD	71		21 - 227
13C-1,2,3,7,8-PeCDF	69		21 - 192
13C-2,3,4,6,7,8-HxCDF	72		22 - 176
13C-2,3,4,7,8-PeCDF	67		13 - 328
13C-2,3,7,8-TCDD	65		20 - 175
13C-2,3,7,8-TCDF	73		22 - 152
13C-OCDD	76		13 - 199

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
37Cl4-2,3,7,8-TCDD	108		31 - 191

Client Sample ID: PDI-SG-B186-BL1
Date Collected: 06/01/18 16:22
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-1
Matrix: Solid
Percent Solids: 69.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230331	06/21/18 01:08	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229940	06/20/18 05:29	SMA	TAL SAC

Client Sample ID: PDI-SG-B182-BL1
Date Collected: 06/01/18 14:26
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-2
Matrix: Solid
Percent Solids: 47.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B		10	230503	06/22/18 16:11	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	10	230331	06/20/18 23:52	AS	TAL SAC

Client Sample ID: PDI-SG-B187-BL1
Date Collected: 06/01/18 16:20
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-3
Matrix: Solid
Percent Solids: 44.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230331	06/21/18 01:46	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229940	06/20/18 07:06	SMA	TAL SAC

Client Sample ID: PDI-SG-B179-BL1
Date Collected: 06/01/18 14:20
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-4
Matrix: Solid
Percent Solids: 42.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		10	230503	06/22/18 16:57	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	10	230338	06/21/18 14:18	ALM	TAL SAC

Client Sample ID: PDI-SG-B110-BL1
Date Collected: 06/02/18 14:45
Date Received: 06/04/18 14:25

Lab Sample ID: 580-77770-5
Matrix: Solid
Percent Solids: 74.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	230070	06/20/18 19:43	AS	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-77770-2

Client Sample ID: PDI-SG-B181-BL1
Lab Sample ID: 580-77770-6
Date Collected: 06/02/18 09:55
Matrix: Solid
Date Received: 06/04/18 14:25
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			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	230070	06/20/18 20:29	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230455	06/22/18 01:37	KSS	TAL SAC

Client Sample ID: PDI-SG-B189-BL1
Lab Sample ID: 580-77770-7
Date Collected: 06/02/18 10:19
Matrix: Solid
Date Received: 06/04/18 14:25
Percent Solids: 46.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	230070	06/20/18 21:15	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230455	06/22/18 02:15	KSS	TAL SAC

Client Sample ID: PDI-SG-B189-BL1-D
Lab Sample ID: 580-77770-8
Date Collected: 06/02/18 10:20
Matrix: Solid
Date Received: 06/04/18 14:25
Percent Solids: 45.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230331	06/21/18 02:23	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229940	06/20/18 07:54	SMA	TAL SAC

Client Sample ID: PDI-SG-B316-BL1
Lab Sample ID: 580-77770-9
Date Collected: 06/02/18 14:34
Matrix: Solid
Date Received: 06/04/18 14:25
Percent Solids: 40.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	230070	06/20/18 22:01	AS	TAL SAC

Client Sample ID: PDI-SG-B317-BL1
Lab Sample ID: 580-77770-10
Date Collected: 06/03/18 09:05
Matrix: Solid
Date Received: 06/04/18 14:25
Percent Solids: 41.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230331	06/21/18 03:01	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			229025	06/14/18 09:34	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229940	06/20/18 08:42	SMA	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-77770-2

Client Sample ID: PDI-SG-B255-BL1

Lab Sample ID: 580-77770-11
Date Collected: 06/03/18 09:55
Matrix: Solid
Date Received: 06/04/18 14:25
Percent Solids: 42.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B		1	230070	06/20/18 22:47	AS	TAL SAC
Total/NA	Prep	HRMS-Sox	RA		228869	06/13/18 12:12	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	230455	06/22/18 02:53	KSS	TAL SAC

Client Sample ID: PDI-RB-VV-180602

Lab Sample ID: 580-77770-12
Date Collected: 06/02/18 15:30
Matrix: Water
Date Received: 06/04/18 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			227727	06/07/18 08:17	A1A	TAL SAC
Total/NA	Analysis	1613B		1	228657	06/11/18 19:44	AS	TAL SAC

Client Sample ID: PDI-RB-VV-180603

Lab Sample ID: 580-77770-13
Date Collected: 06/03/18 12:10
Matrix: Water
Date Received: 06/04/18 14:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1613B			227727	06/07/18 08:17	A1A	TAL SAC
Total/NA	Analysis	1613B		1	228657	06/11/18 20:30	AS	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: 580-77770-2
Project/Site: Portland Harbor Pre-Remedial Design

Laboratory: TestAmerica Seattle

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

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

Laboratory: TestAmerica Sacramento

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

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

Sample Summary

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

TestAmerica Job ID: 580-77770-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77770-1	PDI-SG-B186-BL1	Solid	06/01/18 16:22	06/04/18 14:25
580-77770-2	PDI-SG-B182-BL1	Solid	06/01/18 14:26	06/04/18 14:25
580-77770-3	PDI-SG-B187-BL1	Solid	06/01/18 16:20	06/04/18 14:25
580-77770-4	PDI-SG-B179-BL1	Solid	06/01/18 14:20	06/04/18 14:25
580-77770-5	PDI-SG-B110-BL1	Solid	06/02/18 14:45	06/04/18 14:25
580-77770-6	PDI-SG-B181-BL1	Solid	06/02/18 09:55	06/04/18 14:25
580-77770-7	PDI-SG-B189-BL1	Solid	06/02/18 10:19	06/04/18 14:25
580-77770-8	PDI-SG-B189-BL1-D	Solid	06/02/18 10:20	06/04/18 14:25
580-77770-9	PDI-SG-B316-BL1	Solid	06/02/18 14:34	06/04/18 14:25
580-77770-10	PDI-SG-B317-BL1	Solid	06/03/18 09:05	06/04/18 14:25
580-77770-11	PDI-SG-B255-BL1	Solid	06/03/18 09:55	06/04/18 14:25
580-77770-12	PDI-RB-VV-180602	Water	06/02/18 15:30	06/04/18 14:25
580-77770-13	PDI-RB-VV-180603	Water	06/03/18 12:10	06/04/18 14:25

SURFACE 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** **Analysis Turnaround Time** Calendar (C) or Work Days (W) _____ [x] 21 days [ ] Other _____	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**6/4/2018** **Carrier: Courier**	COC No: 1 1 of 2 page(s)
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: Surface Sediment				

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon 9060, Total solids (104C & 70C)	Archive Archive -20 C	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	WQ - TPH Diesel NWTPH-Dx	WQ - Metals, Mercury 6020B, 7470	WQ - Total Organic Carbon SM5310B	Sample Specific Notes:
PDI-SG-B186-BL1	6/1/2018	16:22	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B182-BL1	6/1/2018	14:26	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B187-BL1	6/1/2018	16:20	SS		MT	6		x	x	x	x	x	x						
PDI-SG-B179-BL1	6/1/2018	14:20	SS		MT	6		x	x	x	x	x	x						
PDI-SG-B110-BL1	6/2/2018	14:45	SS		LS	6		x	x	x	x	x	x						
PDI-SG-B181-BL1	6/2/2018	9:55	SS		LS	6		x	x	x	x	x	x						
PDI-SG-B189-BL1	6/2/2018	10:19	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B189-BL1-D	6/2/2018	10:20	SS		MM	5		x	x	x		x	x						
PDI-SG-B316-BL1	6/2/2018	14:34	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B317-BL1	6/3/2018	9:05	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B255-BL1	6/3/2018	9:55	SS		MM	6		x	x	x	x	x	x						
PDI-RB-VV-180602	6/2/2018	15:30	W		MT	8								x	x	x	x	x	

580-77770 Chain of Custody

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

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

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

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

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

0.9, 3.0, 1.3, 3.4

Relinquished by:	Company: Geosyntec	Date/Time: 6/4/18 1350	Received by:	Company: M.E.	Date/Time: 6/4/18 1350
Relinquished by:	Company: M.E.	Date/Time: 6/4/18 1425	Received by:	Company: TAPOR	Date/Time: 6/4/18 1425
Relinquished by:	Company: TAPOR	Date/Time: 6/4/18 1700	Received by:	Company:	Date/Time:

SURFACE 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** **Laboratory Contact: Elaine-Walker**	**6/4/2018** **Carrier: Courier**	COC No: 1 2 of 2 page(s)

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: Surface Sediment

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

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	WQ - TPH Diesel NWTPH-Dx	WQ - Metals, Mercury 6020B, 7470	WQ - Total Organic Carbon SM5310B	Sample Specific Notes:
PDI-RB-VV-180603	6/3/2018	12:10	W			8		x	x	x	x	x	

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

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

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

	Company	Date/Time	Received by:	Company	Date/Time
Relinquished by:	GROSynTec	6/4/18 1350		M.E.	6/4/18 1350
Relinquished by:	M.E.	6/4/18 1425		TAPOR	6/4/18 1425
Relinquished by:	TAPOR	6/4/18 1700	Received by:	Company:	Date/Time:

SURFACE 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** **Analysis Turnaround Time** Calendar (C) or Work Days (W)	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	6/4/2018 **Carrier: Courier**	COC No. 1 1 of 2 page(s)
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: Surface Sediment	[x] 21 days [ ] Other _____			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D6913	Total organic carbon 9060, Total solids (104C & 70C)	Archive Archive -20 C	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	WQ - TPH Diesel NWTPH-Dx	WQ - Metals, Mercury 6020B, 7470	WQ - Total Organic Carbon SM5310B	Sample Specific Notes:
PDI-SG-B186-BL1	6/1/2018	16:22	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B182-BL1	6/1/2018	14:26	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B187-BL1	6/1/2018	16:20	SS		MT	6		x	x	x	x	x	x						
PDI-SG-B179-BL1	6/1/2018	14:20	SS		MT	6		x	x	x	x	x	x						
PDI-SG-B110-BL1	6/2/2018	14:45	SS		LS	6		x	x	x	x	x	x						
PDI-SG-B181-BL1	6/2/2018	9:55	SS		LS	6		x	x	x	x	x	x						
PDI-SG-B189-BL1	6/2/2018	10:19	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B189-BL1-D	6/2/2018	10:20	SS		MM	5		x	x	x		x	x						
PDI-SG-B316-BL1	6/2/2018	14:34	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B317-BL1	6/3/2018	9:05	SS		MM	6		x	x	x	x	x	x						
PDI-SG-B255-BL1	6/3/2018	9:55	SS		MM	6		x	x	x	x	x	x						
PDI-RB-VV-180602	6/2/2018	15:30	W		MT	8								x	x	x	x	x	

580-77770 Chain of Custody

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

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

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

Sample Disposal

[ ] Return To Client [X] Disposal By Lab [X] Archive For 12 Months

Special Instructions/QC Requirements & Comments:

Separate reports for each lab.

0.9, 3.0, 1.3, 3.4

	Company	Date/Time		Company	Date/Time
Relinquished by:	Geosyntec	6/4/18 1350	Received by:	M.E.	6/4/18 1350
Relinquished by:	M.E.	6/4/18 1425	Received by:	ARDR	6/4/18 1425
Relinquished by:	ARDR	6/4/18 1700	Received by:	ASEA	6-5-18 0930

SURFACE 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** **Analysis Turnaround Time** Calendar (C) or Work Days (W)	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**6/4/2018** **Carrier: Courier**	COC No: 1 2 of 2 page(s)
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: Surface Sediment	[x] 21 days [ ] Other _____			

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	Fraction	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	WQ - TPH Diesel NWTPH-Dx	WQ - Metals, Mercury 6020B, 7470	WQ - Total Organic Carbon SM5310B	Sample Specific Notes:
PDI-RB-VV-180603	6/3/2018	12:10	W			8		x	x	x	x	x	

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

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

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

Sample Disposal
[ ] *Return To Client* [X] *Disposal By Lab* [X] *Archive For 12 Months*

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

	Company	Date/Time		Company	Date/Time
Relinquished by:	GeoSyntec	6/4/18 1350	Received by:	M.E.	6/4/18 1350
Relinquished by:	M.E.	6/4/18 1425	Received by:	TAL-SEA	6/4/18 1425
Relinquished by:	TAL-SEA	6/4/18 1700	Received by:	TAL-SEA	6-5-18 0930

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: 580-55994.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77770-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 6/20/2018			
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.	1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
PDI-SG-B186-BL1 (580-77770-1)	6/1/18	16:22 Pacific		Solid			X	X		2	
PDI-SG-B182-BL1 (580-77770-2)	6/1/18	14:26 Pacific		Solid			X	X		2	
PDI-SG-B187-BL1 (580-77770-3)	6/1/18	16:20 Pacific		Solid			X	X		2	
PDI-SG-B179-BL1 (580-77770-4)	6/1/18	14:20 Pacific		Solid			X	X		2	
PDI-SG-B110-BL1 (580-77770-5)	6/2/18	14:45 Pacific		Solid			X	X		2	
PDI-SG-B181-BL1 (580-77770-6)	6/2/18	09:55 Pacific		Solid			X	X		2	
PDI-SG-B189-BL1 (580-77770-7)	6/2/18	10:19 Pacific		Solid			X	X		2	
PDI-SG-B189-BL1-D (580-77770-8)	6/2/18	10:20 Pacific		Solid			X	X		2	
PDI-SG-B316-BL1 (580-77770-9)	6/2/18	14:34 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:	Company	Received by:	Date/Time:	Company
1		6/4/18 1700	TAL-SAC		6-5-18 900	TASPAE
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	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: 1.4, 3.0

Ver: 09/20/2016

6/25/2018

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: 580-55994.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77770-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 6/20/2018			
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	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)	1613B/HRMS_Sox_P (MOD) Full List w/o Totals	AutoOP/ PH Frozen Archive Container billed @ $0.	1613B/1613B_Sox_Sep_P (MOD) Full List w/o Totals	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
PDI-SG-B317-BL1 (580-77770-10)	6/3/18	09:05 Pacific		Solid			X	X		2	
PDI-SG-B255-BL1 (580-77770-11)	6/3/18	09:55 Pacific		Solid			X	X		2	
PDI-RB-VV-180602 (580-77770-12)	6/2/18	15:30 Pacific		Water					X	2	
PDI-RB-VV-180603 (580-77770-13)	6/3/18	12:10 Pacific		Water					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. I

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:	Company	Received by:	Date/Time:	Company
	[signature]	6/4/18 1700	TAOR	[signature]	6-5-18 9:00	TASRC
	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: 1.4, 3.0

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77770-2

Login Number: 77770
List Number: 1
Creator: O'Connell, Jason I

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.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <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: 580-77770-2

Login Number: 77770
List Number: 2
Creator: Her, David A

List Source: TestAmerica Sacramento
List Creation: 06/05/18 01:59 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.4c 3.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <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: 580-77770-2

Login Number: 77770
List Number: 3
Creator: Her, David A

List Source: TestAmerica Sacramento
List Creation: 06/05/18 02:05 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	1.4c, 3.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <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

580-77770 Field Sheet

Job: _____

Tracking # 442307504378 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 X Gel _____ Other _____

Cooler Custody Seal: Seal

Sample Custody Seal: —

Cooler ID: 1 of 2

Temp: Observed 1.4

From: Temp Blank ☐ Sample ☑

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has 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: dk Date: 6-5-18 Time _____

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job:_____

Tracking #_____ 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 X Gel _____ Other _____

Cooler Custody Seal: Seal

Sample Custody Seal: —

Cooler ID: 2 of 2

Temp: Observed 3.0

From: Temp Blank ☐ Sample ☐

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has 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: AK Date: 6-5-18 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: 580-77770-2

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)
580-77770-1	PDI-SG-B186-BL1	55	45	53	67	71	59	64	68
580-77770-1 - RA	PDI-SG-B186-BL1								
580-77770-2 - RA	PDI-SG-B182-BL1								
580-77770-2	PDI-SG-B182-BL1	35	43	45	52	53	49	52	59
580-77770-3	PDI-SG-B187-BL1	52	45	46	77	85	53	66	62
580-77770-3 - RA	PDI-SG-B187-BL1								
580-77770-4 - RA	PDI-SG-B179-BL1								
580-77770-4	PDI-SG-B179-BL1	16 *	26 *	24 *	42	48	39	46	51
580-77770-5	PDI-SG-B110-BL1	48	52	59	52	50	52	48	57
580-77770-6	PDI-SG-B181-BL1	62	68	76	64	62	61	58	68
580-77770-6 - RA	PDI-SG-B181-BL1								
580-77770-7	PDI-SG-B189-BL1	53	55	66	54	52	50	48	57
580-77770-7 - RA	PDI-SG-B189-BL1								
580-77770-8	PDI-SG-B189-BL1-D	54	38	52	70	68	59	61	68
580-77770-8 - RA	PDI-SG-B189-BL1-D								
580-77770-9	PDI-SG-B316-BL1	52	55	65	53	53	53	50	58
580-77770-10	PDI-SG-B317-BL1	54	34	54	65	65	56	58	65
580-77770-10 - RA	PDI-SG-B317-BL1								
580-77770-11	PDI-SG-B255-BL1	43	47	52	47	46	46	43	52
580-77770-11 - RA	PDI-SG-B255-BL1								
MB 320-228869/1-A	Method Blank	62	64	62	59	76	70	78	72
MB 320-229025/1-A	Method Blank	64	61	64	72	72	64	65	71

		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)	
580-77770-1	PDI-SG-B186-BL1	66	65	68	67	61		61	
580-77770-1 - RA	PDI-SG-B186-BL1						71		
580-77770-2 - RA	PDI-SG-B182-BL1						116		
580-77770-2	PDI-SG-B182-BL1	59	70	40	68	64		20	
580-77770-3	PDI-SG-B187-BL1	71	64	66	66	63		61	
580-77770-3 - RA	PDI-SG-B187-BL1						122		
580-77770-4 - RA	PDI-SG-B179-BL1						60		
580-77770-4	PDI-SG-B179-BL1	56	65	36	57	63		5 *	
580-77770-5	PDI-SG-B110-BL1	55	65	50	65	61	71	42	
580-77770-6	PDI-SG-B181-BL1	64	77	60	75	70		60	
580-77770-6 - RA	PDI-SG-B181-BL1						76		
580-77770-7	PDI-SG-B189-BL1	54	64	51	63	59		51	
580-77770-7 - RA	PDI-SG-B189-BL1						66		
580-77770-8	PDI-SG-B189-BL1-D	66	65	67	65	61		62	
580-77770-8 - RA	PDI-SG-B189-BL1-D						69		
580-77770-9	PDI-SG-B316-BL1	56	66	51	66	63	75	49	
580-77770-10	PDI-SG-B317-BL1	60	60	65	61	57		58	
580-77770-10 - RA	PDI-SG-B317-BL1						66		
580-77770-11	PDI-SG-B255-BL1	50	59	45	61	57		39	
580-77770-11 - RA	PDI-SG-B255-BL1						63		
MB 320-228869/1-A	Method Blank	76	64	74	60	68	67	63	
MB 320-229025/1-A	Method Blank	71	70	71	68	65	73	67	

Surrogate Legend

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

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

Matrix: Solid **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-228869/2-A	Lab Control Sample	58	65	61	64	76	69	77	73
LCS 320-229025/2-A	Lab Control Sample	63	59	61	67	67	60	60	67
LCSD 320-228869/3-A	Lab Control Sample Dup	62	68	64	68	78	72	76	74
LCSD 320-229025/3-A	Lab Control Sample Dup	71	65	70	74	74	63	67	73

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)	
LCS 320-228869/2-A	Lab Control Sample	70	61	75	60	64	66	68	
LCS 320-229025/2-A	Lab Control Sample	64	63	66	63	60	64	68	
LCSD 320-228869/3-A	Lab Control Sample Dup	76	67	78	65	65	70	71	
LCSD 320-229025/3-A	Lab Control Sample Dup	71	69	72	67	65	73	76	

Surrogate Legend

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

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77770-2

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

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
580-77770-12	PDI-RB-VV-180602	60	66	64	60	60	65	63	70
580-77770-13	PDI-RB-VV-180603	57	65	67	56	56	64	59	68
MB 320-227727/1-A	Method Blank	65	73	67	73	70	75	72	75

		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)
580-77770-12	PDI-RB-VV-180602	65	73	67	67	76	81	48
580-77770-13	PDI-RB-VV-180603	63	73	66	64	76	80	45
MB 320-227727/1-A	Method Blank	71	80	73	79	83	88	49

Surrogate Legend

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

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

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-227727/2-A	Lab Control Sample	61	67	67	65	65	69	66	71
LCSD 320-227727/3-A	Lab Control Sample Dup	52	61	60	57	56	59	58	64

		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 320-227727/2-A	Lab Control Sample	69	80	69	75	82	87	48
LCSD 320-227727/3-A	Lab Control Sample Dup	61	70	61	66	75	80	43

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