TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-77656-2
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Karen Mixon

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Authorized for release by:
6/20/2018 4:38:04 PM

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Job ID: 580-77656-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-77656-2

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

Five samples were received on 5/30/2018 12:50 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º 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.

One or more containers for the following sample were received broken or leaking: PDI-SG-B207-BL1 (580-77656-4).One of two soil jars was received with a cracked lid. The lid was taped in the Sacramento lab, and the sample does not appear to be compromised.

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-B128-BL1 (580-77656-1), PDI-SG-B129-BL1 (580-77656-2), PDI-SG-B201-BL1 (580-77656-3), PDI-SG-B207-BL1 (580-77656-4) and PDI-SG-B290-BL1 (580-77656-5) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 06/13/2018 and analyzed on 06/18/2018 and 06/19/2018.

Several analytes were detected in method blank MB 320-228845/1-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.

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SG-B128-BL1 (580-77656-1), PDI-SG-B129-BL1 (580-77656-2), PDI-SG-B201-BL1 (580-77656-3), PDI-SG-B207-BL1 (580-77656-4) and PDI-SG-B290-BL1 (580-77656-5). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-228845.

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

Definitions/Glossary

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

TestAmerica Job ID: 580-77656-2

Qualifiers

Dioxin

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

Glossary

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

Client Sample ID: PDI-SG-B128-BL1

Date Collected: 05/29/18 09:45
Date Received: 05/30/18 12:50

Lab Sample ID: 580-77656-1

Matrix: Solid
Percent Solids: 41.0

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	0.068	B	0.0060	0.00026	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,4,6,7,8-HpCDF	0.019	q B	0.0060	0.00019	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,4,7,8,9-HpCDF	0.0026	J B	0.0060	0.00015	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,4,7,8-HxCDD	0.0012	J B	0.0060	0.000034	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,4,7,8-HxCDF	0.0052	J B	0.0060	0.000069	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,6,7,8-HxCDD	0.0034	J B	0.0060	0.000034	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,6,7,8-HxCDF	0.0016	J B	0.0060	0.000065	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,7,8,9-HxCDD	0.0026	J B	0.0060	0.000031	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,7,8,9-HxCDF	0.0011	J B	0.0060	0.000041	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,7,8-PeCDD	0.0012	J B	0.0060	0.000074	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
1,2,3,7,8-PeCDF	0.0032	J B	0.0060	0.00011	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
2,3,4,6,7,8-HxCDF	0.00078	J B	0.0060	0.000044	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
2,3,4,7,8-PeCDF	0.0016	J B	0.0060	0.00012	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
2,3,7,8-TCDD	0.0055	B	0.0012	0.000047	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
OCDD	0.61	B	0.012	0.00015	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1
OCDF	0.048	B	0.012	0.000027	ug/Kg	☼	06/13/18 10:32	06/18/18 06:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*68*		*23 - 140*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*45*		*28 - 143*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*70*		*26 - 138*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,4,7,8-HxCDD	*70*		*32 - 141*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,4,7,8-HxCDF	*73*		*26 - 152*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,6,7,8-HxCDD	*63*		*28 - 130*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,6,7,8-HxCDF	*63*		*26 - 123*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,7,8,9-HxCDF	*77*		*29 - 147*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,7,8-PeCDD	*34*		*25 - 181*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-1,2,3,7,8-PeCDF	*58*		*24 - 185*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-2,3,4,6,7,8-HxCDF	*76*		*28 - 136*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-2,3,4,7,8-PeCDF	*59*		*21 - 178*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-2,3,7,8-TCDD	*68*		*25 - 164*	*06/13/18 10:32*	*06/18/18 06:01*	*1*
13C-OCDD	*64*		*17 - 157*	*06/13/18 10:32*	*06/18/18 06:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*114*		*35 - 197*	*06/13/18 10:32*	*06/18/18 06:01*	*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	0.0058	B	0.0012	0.00014	ug/Kg	☼	06/13/18 10:32	06/19/18 13:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*74*		*24 - 169*	*06/13/18 10:32*	*06/19/18 13:54*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*103*		*35 - 197*	*06/13/18 10:32*	*06/19/18 13:54*	*1*

Client Sample ID: PDI-SG-B129-BL1
Date Collected: 05/29/18 10:30
Date Received: 05/30/18 12:50

Lab Sample ID: 580-77656-2
Matrix: Solid
Percent Solids: 47.2

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	0.059	B	0.0051	0.00026	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,4,6,7,8-HpCDF	0.014	B	0.0051	0.00017	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,4,7,8,9-HpCDF	0.0022	J B	0.0051	0.00016	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,4,7,8-HxCDD	0.00077	J B	0.0051	0.000047	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,4,7,8-HxCDF	0.0048	J B	0.0051	0.00012	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,6,7,8-HxCDD	0.0029	J B	0.0051	0.000049	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,6,7,8-HxCDF	0.0017	J B	0.0051	0.00011	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,7,8,9-HxCDD	0.0019	J B	0.0051	0.000043	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,7,8,9-HxCDF	0.00088	J B	0.0051	0.000078	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,7,8-PeCDD	0.00047	J q B	0.0051	0.000082	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
1,2,3,7,8-PeCDF	0.0027	J B	0.0051	0.000092	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
2,3,4,6,7,8-HxCDF	0.00053	J B	0.0051	0.000085	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
2,3,4,7,8-PeCDF	0.0010	J B	0.0051	0.00010	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
2,3,7,8-TCDD	0.00040	J q B	0.0010	0.000068	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
OCDD	0.54	B	0.010	0.00017	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1
OCDF	0.040	B	0.010	0.000083	ug/Kg	☼	06/13/18 10:32	06/18/18 06:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*58*		*23 - 140*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*43*		*28 - 143*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*59*		*26 - 138*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,4,7,8-HxCDD	*70*		*32 - 141*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,4,7,8-HxCDF	*72*		*26 - 152*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,6,7,8-HxCDD	*58*		*28 - 130*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,6,7,8-HxCDF	*67*		*26 - 123*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,7,8,9-HxCDF	*73*		*29 - 147*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,7,8-PeCDD	*61*		*25 - 181*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-2,3,4,6,7,8-HxCDF	*72*		*28 - 136*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-2,3,4,7,8-PeCDF	*66*		*21 - 178*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-2,3,7,8-TCDD	*63*		*25 - 164*	*06/13/18 10:32*	*06/18/18 06:49*	*1*
13C-OCDD	*57*		*17 - 157*	*06/13/18 10:32*	*06/18/18 06:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*116*		*35 - 197*	*06/13/18 10:32*	*06/18/18 06:49*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.0017	B	0.0010	0.00012	ug/Kg	☼	06/13/18 10:32	06/19/18 14:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*70*		*24 - 169*	*06/13/18 10:32*	*06/19/18 14:31*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*100*		*35 - 197*	*06/13/18 10:32*	*06/19/18 14:31*	*1*

Client Sample ID: PDI-SG-B201-BL1
Date Collected: 05/29/18 13:05
Date Received: 05/30/18 12:50

Lab Sample ID: 580-77656-3
Matrix: Solid
Percent Solids: 61.8

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	0.068	B	0.0039	0.00045	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,4,6,7,8-HpCDF	0.018	B	0.0039	0.00022	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,4,7,8,9-HpCDF	0.0031	J B	0.0039	0.00025	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,4,7,8-HxCDD	0.00056	J B	0.0039	0.000048	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,4,7,8-HxCDF	0.012	B	0.0039	0.00010	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,6,7,8-HxCDD	0.0025	J B	0.0039	0.000045	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,6,7,8-HxCDF	0.0035	J B	0.0039	0.000094	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,7,8,9-HxCDD	0.0014	J B	0.0039	0.000042	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,7,8,9-HxCDF	0.00083	J B	0.0039	0.000065	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,7,8-PeCDD	0.00029	J B	0.0039	0.000069	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
1,2,3,7,8-PeCDF	0.0058	B	0.0039	0.00011	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
2,3,4,6,7,8-HxCDF	0.00069	J B	0.0039	0.000075	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
2,3,4,7,8-PeCDF	0.0023	J B	0.0039	0.00012	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
2,3,7,8-TCDD	0.00039	J q B	0.00079	0.000044	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
OCDD	0.82	B	0.0079	0.00021	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1
OCDF	0.062	B	0.0079	0.000057	ug/Kg	☼	06/13/18 10:32	06/18/18 07:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*56*		*23 - 140*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*50*		*28 - 143*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*57*		*26 - 138*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,4,7,8-HxCDD	*66*		*32 - 141*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,4,7,8-HxCDF	*72*		*26 - 152*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,6,7,8-HxCDD	*56*		*28 - 130*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,6,7,8-HxCDF	*65*		*26 - 123*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,7,8,9-HxCDF	*72*		*29 - 147*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,7,8-PeCDD	*62*		*25 - 181*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-1,2,3,7,8-PeCDF	*64*		*24 - 185*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-2,3,4,6,7,8-HxCDF	*70*		*28 - 136*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-2,3,4,7,8-PeCDF	*65*		*21 - 178*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-2,3,7,8-TCDD	*64*		*25 - 164*	*06/13/18 10:32*	*06/18/18 07:37*	*1*
13C-OCDD	*54*		*17 - 157*	*06/13/18 10:32*	*06/18/18 07:37*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*118*		*35 - 197*	*06/13/18 10:32*	*06/18/18 07:37*	*1*

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,7,8-TCDF	0.0057	B	0.00079	0.00012	ug/Kg	☼	06/13/18 10:32	06/19/18 15:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*72*		*24 - 169*	*06/13/18 10:32*	*06/19/18 15:09*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*101*		*35 - 197*	*06/13/18 10:32*	*06/19/18 15:09*	*1*

Client Sample ID: PDI-SG-B207-BL1

Date Collected: 05/29/18 14:10
Date Received: 05/30/18 12:50

Lab Sample ID: 580-77656-4

Matrix: Solid
Percent Solids: 70.9

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	0.021	B	0.0035	0.00015	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,4,6,7,8-HpCDF	0.014	B	0.0035	0.00018	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,4,7,8,9-HpCDF	0.0040	B	0.0035	0.00027	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,4,7,8-HxCDD	0.00056	J B	0.0035	0.000042	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,4,7,8-HxCDF	0.019	B	0.0035	0.00018	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,6,7,8-HxCDD	0.0013	J B	0.0035	0.000041	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,6,7,8-HxCDF	0.0046	B	0.0035	0.00017	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,7,8,9-HxCDD	0.0011	J q B	0.0035	0.000037	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,7,8,9-HxCDF	0.00083	J B	0.0035	0.00011	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,7,8-PeCDD	0.00049	J B	0.0035	0.000069	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
1,2,3,7,8-PeCDF	0.0099	B	0.0035	0.00020	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
2,3,4,6,7,8-HxCDF	0.0014	J B	0.0035	0.00012	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
2,3,4,7,8-PeCDF	0.0046	B	0.0035	0.00022	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
2,3,7,8-TCDD	0.00024	J q B	0.00071	0.000079	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
OCDD	0.14	B	0.0071	0.000078	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	1
OCDF	0.025	B	0.0071	0.000057	ug/Kg	☼	06/13/18 10:32	06/18/18 08:26	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 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*46*		*28 - 143*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*45*		*26 - 138*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,4,7,8-HxCDD	*62*		*32 - 141*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,4,7,8-HxCDF	*64*		*26 - 152*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,6,7,8-HxCDD	*54*		*28 - 130*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,6,7,8-HxCDF	*58*		*26 - 123*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,7,8,9-HxCDF	*65*		*29 - 147*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,7,8-PeCDD	*55*		*25 - 181*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-1,2,3,7,8-PeCDF	*58*		*24 - 185*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-2,3,4,6,7,8-HxCDF	*65*		*28 - 136*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-2,3,4,7,8-PeCDF	*59*		*21 - 178*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-2,3,7,8-TCDD	*58*		*25 - 164*	*06/13/18 10:32*	*06/18/18 08:26*	*1*
13C-OCDD	*50*		*17 - 157*	*06/13/18 10:32*	*06/18/18 08:26*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*116*		*35 - 197*	*06/13/18 10:32*	*06/18/18 08:26*	*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	0.0084	B	0.00071	0.00018	ug/Kg	☼	06/13/18 10:32	06/19/18 15:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*69*		*24 - 169*	*06/13/18 10:32*	*06/19/18 15:47*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*101*		*35 - 197*	*06/13/18 10:32*	*06/19/18 15:47*	*1*

Client Sample ID: PDI-SG-B290-BL1

Date Collected: 05/29/18 15:15
Date Received: 05/30/18 12:50

Lab Sample ID: 580-77656-5

Matrix: Solid
Percent Solids: 47.1

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	0.099	B	0.0052	0.00060	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,4,6,7,8-HpCDF	0.016	B	0.0052	0.00023	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,4,7,8,9-HpCDF	0.0015	J B	0.0052	0.00025	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,4,7,8-HxCDD	0.00098	J B	0.0052	0.000059	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,4,7,8-HxCDF	0.0014	J B	0.0052	0.000094	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,6,7,8-HxCDD	0.0037	J B	0.0052	0.000060	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,6,7,8-HxCDF	0.00097	J B	0.0052	0.000089	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,7,8,9-HxCDD	0.0026	J B	0.0052	0.000053	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,7,8,9-HxCDF	0.00085	J B	0.0052	0.000064	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,7,8-PeCDD	0.00061	J B	0.0052	0.000080	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
1,2,3,7,8-PeCDF	0.00057	J B	0.0052	0.000077	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
2,3,4,6,7,8-HxCDF	0.00048	J B	0.0052	0.000068	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
2,3,4,7,8-PeCDF	0.00053	J B	0.0052	0.000081	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
2,3,7,8-TCDD	0.0015	B	0.0010	0.000052	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
OCDD	0.99	B	0.010	0.00033	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1
OCDF	0.059	B	0.010	0.000053	ug/Kg	☼	06/13/18 10:32	06/18/18 09:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*58*		*23 - 140*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*51*		*28 - 143*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*59*		*26 - 138*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,4,7,8-HxCDD	*69*		*32 - 141*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,4,7,8-HxCDF	*72*		*26 - 152*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,6,7,8-HxCDD	*59*		*28 - 130*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,6,7,8-HxCDF	*64*		*26 - 123*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,7,8,9-HxCDF	*69*		*29 - 147*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,7,8-PeCDD	*58*		*25 - 181*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-1,2,3,7,8-PeCDF	*61*		*24 - 185*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-2,3,4,6,7,8-HxCDF	*70*		*28 - 136*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-2,3,4,7,8-PeCDF	*62*		*21 - 178*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-2,3,7,8-TCDD	*61*		*25 - 164*	*06/13/18 10:32*	*06/18/18 09:14*	*1*
13C-OCDD	*58*		*17 - 157*	*06/13/18 10:32*	*06/18/18 09:14*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*117*		*35 - 197*	*06/13/18 10:32*	*06/18/18 09:14*	*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	0.00089	J B q	0.0010	0.000087	ug/Kg	☼	06/13/18 10:32	06/19/18 16:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-2,3,7,8-TCDF	*68*		*24 - 169*	*06/13/18 10:32*	*06/19/18 16:25*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*104*		*35 - 197*	*06/13/18 10:32*	*06/19/18 16:25*	*1*

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

Lab Sample ID: MB 320-228845/1-A
Matrix: Solid
Analysis Batch: 229417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 228845

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000207	J	0.0050	0.000011	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,4,6,7,8-HpCDF	0.000210	J	0.0050	0.000022	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,4,7,8,9-HpCDF	0.000642	J	0.0050	0.000028	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,4,7,8-HxCDD	0.000181	J	0.0050	0.000014	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,4,7,8-HxCDF	0.000170	J	0.0050	0.000023	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,6,7,8-HxCDD	0.000105	J q	0.0050	0.000014	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,6,7,8-HxCDF	0.0000830	J q	0.0050	0.000021	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,7,8,9-HxCDD	0.000123	J	0.0050	0.000013	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,7,8,9-HxCDF	0.000799	J	0.0050	0.000016	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,7,8-PeCDD	0.0000809	J q	0.0050	0.000019	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
1,2,3,7,8-PeCDF	0.000188	J	0.0050	0.000017	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
2,3,4,6,7,8-HxCDF	0.0000677	J q	0.0050	0.000016	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
2,3,4,7,8-PeCDF	0.0000902	J	0.0050	0.000019	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
2,3,7,8-TCDD	0.000145	J q	0.0010	0.000016	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
2,3,7,8-TCDF	0.000115	J q	0.0010	0.000013	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
OCDD	0.000817	J	0.010	0.000015	ug/Kg		06/13/18 10:32	06/17/18 16:36	1
OCDF	0.000378	J	0.010	0.000013	ug/Kg		06/13/18 10:32	06/17/18 16:36	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C-1,2,3,4,6,7,8-HpCDD	*71*		*23 - 140*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,4,6,7,8-HpCDF	*70*		*28 - 143*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,4,7,8,9-HpCDF	*73*		*26 - 138*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,4,7,8-HxCDD	*74*		*32 - 141*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,4,7,8-HxCDF	*79*		*26 - 152*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,6,7,8-HxCDD	*67*		*28 - 130*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,6,7,8-HxCDF	*72*		*26 - 123*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,7,8,9-HxCDF	*77*		*29 - 147*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,7,8-PeCDD	*65*		*25 - 181*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-1,2,3,7,8-PeCDF	*69*		*24 - 185*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-2,3,4,6,7,8-HxCDF	*79*		*28 - 136*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-2,3,4,7,8-PeCDF	*69*		*21 - 178*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-2,3,7,8-TCDD	*69*		*25 - 164*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-2,3,7,8-TCDF	*77*		*24 - 169*	*06/13/18 10:32*	*06/17/18 16:36*	*1*
13C-OCDD	*71*		*17 - 157*	*06/13/18 10:32*	*06/17/18 16:36*	*1*

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
37Cl4-2,3,7,8-TCDD	*115*		*35 - 197*	*06/13/18 10:32*	*06/17/18 16:36*	*1*

Lab Sample ID: LCS 320-228845/2-A
Matrix: Solid
Analysis Batch: 229417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228845

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.110		ug/Kg		110	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.110		ug/Kg		110	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.107		ug/Kg		107	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.110		ug/Kg		110	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.108		ug/Kg		108	72 - 134

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

Lab Sample ID: LCS 320-228845/2-A
Matrix: Solid
Analysis Batch: 229417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 228845

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3,6,7,8-HxCDD	0.100	0.107		ug/Kg		107	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.109		ug/Kg		109	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.155		ug/Kg		155	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.108		ug/Kg		108	78 - 130
1,2,3,7,8-PeCDD	0.100	0.109		ug/Kg		109	70 - 142
1,2,3,7,8-PeCDF	0.100	0.111		ug/Kg		111	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.107		ug/Kg		107	70 - 156
2,3,4,7,8-PeCDF	0.100	0.115		ug/Kg		115	68 - 160
2,3,7,8-TCDD	0.0200	0.0246		ug/Kg		123	67 - 158
2,3,7,8-TCDF	0.0200	0.0218		ug/Kg		109	75 - 158
OCDD	0.200	0.214		ug/Kg		107	78 - 144
OCDF	0.200	0.211		ug/Kg		105	63 - 170

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*71*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*60*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*74*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*50*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*56*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*52*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*55*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*78*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*65*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*69*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*74*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*50*		*13 - 328*
13C-2,3,7,8-TCDD	*66*		*20 - 175*
13C-2,3,7,8-TCDF	*76*		*22 - 152*
13C-OCDD	*73*		*13 - 199*

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*113*		*31 - 191*

Lab Sample ID: LCSD 320-228845/3-A
Matrix: Solid
Analysis Batch: 229417

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228845

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	0.109		ug/Kg		109	70 - 140	1	50
1,2,3,4,6,7,8-HpCDF	0.100	0.109		ug/Kg		109	82 - 122	1	50
1,2,3,4,7,8,9-HpCDF	0.100	0.106		ug/Kg		106	78 - 138	1	50
1,2,3,4,7,8-HxCDD	0.100	0.110		ug/Kg		110	70 - 164	0	50
1,2,3,4,7,8-HxCDF	0.100	0.105		ug/Kg		105	72 - 134	3	50
1,2,3,6,7,8-HxCDD	0.100	0.108		ug/Kg		108	76 - 134	1	50
1,2,3,6,7,8-HxCDF	0.100	0.107		ug/Kg		107	84 - 130	1	50
1,2,3,7,8,9-HxCDD	0.100	0.117		ug/Kg		117	64 - 162	28	50
1,2,3,7,8,9-HxCDF	0.100	0.108		ug/Kg		108	78 - 130	0	50
1,2,3,7,8-PeCDD	0.100	0.107		ug/Kg		107	70 - 142	2	50

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

Lab Sample ID: LCSD 320-228845/3-A
Matrix: Solid
Analysis Batch: 229417

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 228845

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF			0.100	0.111		ug/Kg		111	80 - 134	1	50
2,3,4,6,7,8-HxCDF			0.100	0.107		ug/Kg		107	70 - 156	0	50
2,3,4,7,8-PeCDF			0.100	0.109		ug/Kg		109	68 - 160	6	50
2,3,7,8-TCDD			0.0200	0.0230		ug/Kg		115	67 - 158	7	50
2,3,7,8-TCDF			0.0200	0.0217		ug/Kg		108	75 - 158	1	50
OCDD			0.200	0.212		ug/Kg		106	78 - 144	1	50
OCDF			0.200	0.205		ug/Kg		102	63 - 170	3	50

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C-1,2,3,4,6,7,8-HpCDD	*75*		*26 - 166*
13C-1,2,3,4,6,7,8-HpCDF	*75*		*21 - 158*
13C-1,2,3,4,7,8,9-HpCDF	*78*		*20 - 186*
13C-1,2,3,4,7,8-HxCDD	*79*		*21 - 193*
13C-1,2,3,4,7,8-HxCDF	*84*		*19 - 202*
13C-1,2,3,6,7,8-HxCDD	*67*		*25 - 163*
13C-1,2,3,6,7,8-HxCDF	*74*		*21 - 159*
13C-1,2,3,7,8,9-HxCDF	*81*		*17 - 205*
13C-1,2,3,7,8-PeCDD	*69*		*21 - 227*
13C-1,2,3,7,8-PeCDF	*72*		*21 - 192*
13C-2,3,4,6,7,8-HxCDF	*80*		*22 - 176*
13C-2,3,4,7,8-PeCDF	*73*		*13 - 328*
13C-2,3,7,8-TCDD	*70*		*20 - 175*
13C-2,3,7,8-TCDF	*81*		*22 - 152*
13C-OCDD	*78*		*13 - 199*

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
37Cl4-2,3,7,8-TCDD	*116*		*31 - 191*

Lab Chronicle

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

TestAmerica Job ID: 580-77656-2

Client Sample ID: PDI-SG-B128-BL1

Lab Sample ID: 580-77656-1
Date Collected: 05/29/18 09:45
Matrix: Solid
Date Received: 05/30/18 12:50
Percent Solids: 41.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229871	06/19/18 13:54	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox			228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229418	06/18/18 06:01	AS	TAL SAC

Client Sample ID: PDI-SG-B129-BL1

Lab Sample ID: 580-77656-2
Date Collected: 05/29/18 10:30
Matrix: Solid
Date Received: 05/30/18 12:50
Percent Solids: 47.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229871	06/19/18 14:31	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox			228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229418	06/18/18 06:49	AS	TAL SAC

Client Sample ID: PDI-SG-B201-BL1

Lab Sample ID: 580-77656-3
Date Collected: 05/29/18 13:05
Matrix: Solid
Date Received: 05/30/18 12:50
Percent Solids: 61.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229871	06/19/18 15:09	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox			228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229418	06/18/18 07:37	AS	TAL SAC

Client Sample ID: PDI-SG-B207-BL1

Lab Sample ID: 580-77656-4
Date Collected: 05/29/18 14:10
Matrix: Solid
Date Received: 05/30/18 12:50
Percent Solids: 70.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229871	06/19/18 15:47	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox			228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B		1	229418	06/18/18 08:26	AS	TAL SAC

Client Sample ID: PDI-SG-B290-BL1

Lab Sample ID: 580-77656-5
Date Collected: 05/29/18 15:15
Matrix: Solid
Date Received: 05/30/18 12:50
Percent Solids: 47.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		228845	06/13/18 10:32	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	229871	06/19/18 16:25	ALM	TAL SAC
Total/NA	Prep	HRMS-Sox			228845	06/13/18 10:32	SR1	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 580-77656-2

Client Sample ID: PDI-SG-B290-BL1
Date Collected: 05/29/18 15:15
Date Received: 05/30/18 12:50

Lab Sample ID: 580-77656-5
Matrix: Solid
Percent Solids: 47.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1613B		1	229418	06/18/18 09:14	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: 580-77656-2
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
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
L-A-B	DoD ELAP		L2468	01-20-21
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: 580-77656-2

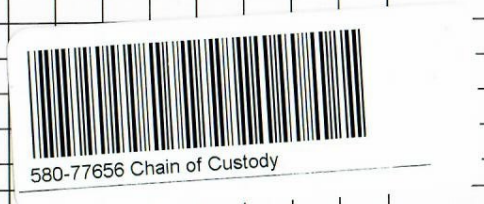
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-77656-1	PDI-SG-B128-BL1	Solid	05/29/18 09:45	05/30/18 12:50
580-77656-2	PDI-SG-B129-BL1	Solid	05/29/18 10:30	05/30/18 12:50
580-77656-3	PDI-SG-B201-BL1	Solid	05/29/18 13:05	05/30/18 12:50
580-77656-4	PDI-SG-B207-BL1	Solid	05/29/18 14:10	05/30/18 12:50
580-77656-5	PDI-SG-B290-BL1	Solid	05/29/18 15:15	05/30/18 12:50

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**	**5/29/2018** COC No: 1 **Carrier: Courier** _1_ of _1_ 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, Total solids 9060	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-B128-BL1	5/29/2018	9:45	SS		AM	6		x	x	x	x	x	x						
PDI-SG-B129-BL1	5/29/2018	10:30	SS	MS/MSD	AM	12		x	x	x	x	x	x						
PDI-SG-B201-BL1	5/29/2018	13:05	SS		AM	6		x	x	x	x	x	x						
PDI-SG-B207-BL1	5/29/2018	14:10	SS		AM	6		x	x	x	x	x	x						
PDI-SG-B290-BL1	5/29/2018	15:15	SS		AM	6		x	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] isposal By Lab [X] rchive For 12 Months

Special Instructions/QC Requirements & Comments:

Separate reports for each lab

13

Relinquished by:	Company: AECOM	Date/Time: 5/30/18 1215	Received by:	Company: M.E.	Date/Time: 5/30/18 1215
Relinquished by:	Company: M.E.	Date/Time: 5/30/18 1250	Received by:	Company: TABOR	Date/Time: 5/30/18 1250
Relinquished by:	Company:	Date/Time:	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**			
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	**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**	**5/29/2018** **Carrier: Courier**
			COC No: 1 1 of 1 page(s)

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, Total solids 9060	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-B128-BL1	5/29/2018	9:45	SS		AM	6		x	x	x	x	x	x						
PDI-SG-B129-BL1	5/29/2018	10:30	SS	MS/MSD	AM	12		x	x	x	x	x	x						
PDI-SG-B201-BL1	5/29/2018	13:05	SS		AM	6		x	x	x	x	x	x						
PDI-SG-B207-BL1	5/29/2018	14:10	SS		AM	6		x	x	x	x	x	x						
PDI-SG-B290-BL1	5/29/2018	15:15	SS		AM	6		x	x	x	x	x	x						

580-77656 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

1.3

Relinquished by:	Company: AECOM	Date/Time: 5/30/18 1215	Received by:	Company: M.E.	Date/Time: 5/30/18 1215
Relinquished by:	Company: M.E.	Date/Time: 5/30/18 1250	Received by:	Company: TAPER	Date/Time: 5/30/18 1250
Relinquished by:	Company: TAPER	Date/Time: 5/30/18 1700	Received by:	Company: SK A D	Date/Time: 5/31/18 0935

IRY = 1.3/1.1 w/C.S.

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: 580-55812.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: elaine.walker@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 580-77656-1
Address: 880 Riverside Parkway,	Due Date Requested: 6/15/2018			
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.	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
PDI-SG-B128-BL1 (580-77656-1)	5/29/18	09:45 Pacific		Solid			X	X	2	
PDI-SG-B129-BL1 (580-77656-2)	5/29/18	10:30 Pacific		Solid			X	X	2	
PDI-SG-B201-BL1 (580-77656-3)	5/29/18	13:05 Pacific		Solid			X	X	2	
PDI-SG-B207-BL1 (580-77656-4)	5/29/18	14:10 Pacific		Solid			X	X	2	
PDI-SG-B290-BL1 (580-77656-5)	5/29/18	15:15 Pacific		Solid			X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	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:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	5/30/18 1430	TAPOR		5/31/18 1000	TA Sac
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 15c

1/2 Recived with Cracked Lid. Taken in Lab 5/31/18

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-77656-2

Login Number: 77656
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	

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77656-2

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)
580-77656-1	PDI-SG-B128-BL1	68	45	70	70	73	63	63	77
580-77656-2	PDI-SG-B129-BL1	58	43	59	70	72	58	67	73
580-77656-3	PDI-SG-B201-BL1	56	50	57	66	72	56	65	72
580-77656-4	PDI-SG-B207-BL1	53	46	45	62	64	54	58	65
580-77656-5	PDI-SG-B290-BL1	58	51	59	69	72	59	64	69

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	OCDD (17-157)		
580-77656-1	PDI-SG-B128-BL1	34	58	76	59	68	64		
580-77656-2	PDI-SG-B129-BL1	61	64	72	66	63	57		
580-77656-3	PDI-SG-B201-BL1	62	64	70	65	64	54		
580-77656-4	PDI-SG-B207-BL1	55	58	65	59	58	50		
580-77656-5	PDI-SG-B290-BL1	58	61	70	62	61	58		

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
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	TCDF (24-169)							
580-77656-1 - RA	PDI-SG-B128-BL1	74							
580-77656-2 - RA	PDI-SG-B129-BL1	70							
580-77656-3 - RA	PDI-SG-B201-BL1	72							
580-77656-4 - RA	PDI-SG-B207-BL1	69							
580-77656-5 - RA	PDI-SG-B290-BL1	68							

Surrogate Legend

TCDF = 13C-2,3,7,8-TCDF

Isotope Dilution Summary

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

TestAmerica Job ID: 580-77656-2

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

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-228845/2-A	Lab Control Sample	71	60	74	50	56	52	55	78
LCSD 320-228845/3-A	Lab Control Sample Dup	75	75	78	79	84	67	74	81

		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 320-228845/2-A	Lab Control Sample	65	69	74	50	66	76	73	
LCSD 320-228845/3-A	Lab Control Sample Dup	69	72	80	73	70	81	78	

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 (23-140)	HpCDF (28-143)	HpCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxDD (28-130)	HxDF (26-123)	HxCF (29-147)
MB 320-228845/1-A	Method Blank	71	70	73	74	79	67	72	77

		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)	
MB 320-228845/1-A	Method Blank	65	69	79	69	69	77	71	

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