

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-79203-2

Client Project/Site: Portland Harbor Pre-Remedial Design

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Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page	1
Table of Contents	2
Case Narrative	3
Definitions	5
Client Sample Results	6
QC Sample Results	14
Chronicle	17
Certification Summary	19
Sample Summary	20
Chain of Custody	21
Receipt Checklists	24
Field Data Sheets	26
Isotope Dilution Summary	27

Case Narrative

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Job ID: 580-79203-2

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-79203-2

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

The samples were received on 07/30/2018; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.7 C.

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

DIOXIN/ FURAN

Samples PDI-SC-S163-0to2 (580-79203-1), PDI-SC-S163-2to4 (580-79203-2), PDI-SC-S163-4to6 (580-79203-3), PDI-SC-S163-6to8 (580-79203-4), PDI-SC-S163-8to10 (580-79203-5), PDI-SC-S163-10to12.7 (580-79203-6), PDI-SC-S163-12.7to13 (580-79203-7) and PDI-SC-S251-2to2.5 (580-79203-8) were analyzed for Dioxin/ Furan in accordance with 1613B. The samples were prepared on 08/13/2018 and analyzed on 08/15/2018 and 08/17/2018.

OCDD was detected in method blank MB 320-239564/1-A at a level that was above the method detection limit but below half the reporting limit (1/2 RL); therefore, the data have been .

Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: PDI-SC-S163-0to2 (580-79203-1), PDI-SC-S163-2to4 (580-79203-2), PDI-SC-S163-4to6 (580-79203-3), PDI-SC-S163-6to8 (580-79203-4), PDI-SC-S163-8to10 (580-79203-5), PDI-SC-S163-10to12.7 (580-79203-6), PDI-SC-S163-12.7to13 (580-79203-7) and PDI-SC-S251-2to2.5 (580-79203-8). The reporting limits (RLs) have been adjusted proportionately. Samples are associated with preparation batch 320-239564.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: PDI-SC-S163-2to4 (580-79203-2), PDI-SC-S163-4to6 (580-79203-3), PDI-SC-S163-6to8 (580-79203-4), PDI-SC-S163-8to10 (580-79203-5) and PDI-SC-S163-10to12.7 (580-79203-6). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

The following samples exhibited elevated noise or matrix interferences for one or more analytes causing elevation of the detection limit (EDL): PDI-SC-S163-10to12.7 (580-79203-6) .The reporting limit (RL) for the affected analytes has been raised to be equal to the EDL,

Case Narrative

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Job ID: 580-79203-2 (Continued)

Laboratory: TestAmerica Seattle (Continued)

and a "G" qualifier applied.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD associated with the following samples run on instrument 11D2 exceeded this criteria: PDI-SC-S163-0to2 (580-79203-1), PDI-SC-S163-2to4 (580-79203-2), PDI-SC-S163-4to6 (580-79203-3), PDI-SC-S163-6to8 (580-79203-4), PDI-SC-S163-8to10 (580-79203-5), PDI-SC-S163-10to12.7 (580-79203-6) and (CCV 320-240639/2). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

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: 580-79203-2

Qualifiers

Dioxin

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
q	The reported result is the estimated maximum possible concentration of this analyte, quantitated using the theoretical ion ratio. The measured ion ratio does not meet qualitative identification criteria and indicates a possible interference.
B	Compound was found in the blank and sample.
E	Result exceeded calibration range.
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference

Glossary

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

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-0to2

Date Collected: 07/27/18 12:50

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-1

Matrix: Solid

Percent Solids: 52.2

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	0.21		0.0047	0.0046	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,4,6,7,8-HpCDF	0.056		0.0047	0.0014	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,4,7,8,9-HpCDF	0.0031 J	J	0.0047	0.0018	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,4,7,8-HxCDD	0.0015 J	J	0.0047	0.00034	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,4,7,8-HxCDF	0.0035 J	J	0.0047	0.00062	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,6,7,8-HxCDD	0.0061		0.0047	0.00030	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,6,7,8-HxCDF	0.0068		0.0047	0.00059	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,7,8,9-HxCDD	0.0042 J	J	0.0047	0.00029	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,7,8,9-HxCDF	ND		0.0047	0.00046	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,7,8-PeCDD	0.00086 J	J	0.0047	0.00016	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
1,2,3,7,8-PeCDF	0.0015 J	J	0.0047	0.00021	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
2,3,4,6,7,8-HxCDF	0.0012 J	J	0.0047	0.00045	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
2,3,4,7,8-PeCDF	0.00083 J q	J q	0.0047	0.00025	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
2,3,7,8-TCDD	0.00073 J q	J q	0.00095	0.000098	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
OCDD	3.2 B	B	0.0095	0.0025	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
OCDF	0.17		0.0095	0.00022	ug/Kg	✉	08/13/18 10:41	08/15/18 15:11	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>		<i>Limits</i>			<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-1,2,3,4,6,7,8-HpCDD	58			23 - 140			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,4,6,7,8-HpCDF	45			28 - 143			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,4,7,8,9-HpCDF	55			26 - 138			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,4,7,8-HxCDD	51			32 - 141			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,4,7,8-HxCDF	48			26 - 152			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,6,7,8-HxCDD	55			28 - 130			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,6,7,8-HxCDF	45			26 - 123			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,7,8,9-HxCDF	55			29 - 147			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,7,8-PeCDD	63			25 - 181			08/13/18 10:41	08/15/18 15:11	1
13C-1,2,3,7,8-PeCDF	61			24 - 185			08/13/18 10:41	08/15/18 15:11	1
13C-2,3,4,6,7,8-HxCDF	50			28 - 136			08/13/18 10:41	08/15/18 15:11	1
13C-2,3,4,7,8-PeCDF	57			21 - 178			08/13/18 10:41	08/15/18 15:11	1
13C-2,3,7,8-TCDD	59			25 - 164			08/13/18 10:41	08/15/18 15:11	1
13C-OCDD	70			17 - 157			08/13/18 10:41	08/15/18 15:11	1
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>		<i>Limits</i>			<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
37Cl4-2,3,7,8-TCDD	100			35 - 197			08/13/18 10:41	08/15/18 15:11	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	0.0010		0.00095	0.00031	ug/Kg	✉	08/13/18 10:41	08/17/18 19:52	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>		<i>Limits</i>			<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C-2,3,7,8-TCDF	54			24 - 169			08/13/18 10:41	08/17/18 19:52	1
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>		<i>Limits</i>			<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
37Cl4-2,3,7,8-TCDD	87			35 - 197			08/13/18 10:41	08/17/18 19:52	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-2to4

Date Collected: 07/27/18 12:55

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-2

Matrix: Solid

Percent Solids: 52.4

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	0.24		0.0047	0.0031	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,4,6,7,8-HpCDF	0.092		0.0047	0.0015	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,4,7,8,9-HpCDF	0.0037 J	J	0.0047	0.0027	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,4,7,8-HxCDD	0.0019 J	J	0.0047	0.00033	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,4,7,8-HxCDF	0.0046 J	J	0.0047	0.00073	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,6,7,8-HxCDD	0.0088		0.0047	0.00030	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,6,7,8-HxCDF	0.011		0.0047	0.00065	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,7,8,9-HxCDD	0.0041 J	J	0.0047	0.00029	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,7,8,9-HxCDF	ND		0.0047	0.00048	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,7,8-PeCDD	0.0012 J	J	0.0047	0.00026	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
1,2,3,7,8-PeCDF	0.0022 J	J	0.0047	0.00045	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
2,3,4,6,7,8-HxCDF	0.0014 J	J	0.0047	0.00051	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
2,3,4,7,8-PeCDF	0.0016 J	J	0.0047	0.00052	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
2,3,7,8-TCDD	0.0013		0.00095	0.000092	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
OCDD	4.3 E B		0.0095	0.0028	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
OCDF	0.28		0.0095	0.00047	ug/Kg	✉	08/13/18 10:41	08/15/18 15:59	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	45		23 - 140				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,4,6,7,8-HpCDF	34		28 - 143				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,4,7,8,9-HpCDF	35		26 - 138				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,4,7,8-HxCDD	54		32 - 141				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,4,7,8-HxCDF	46		26 - 152				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,6,7,8-HxCDD	48		28 - 130				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,6,7,8-HxCDF	43		26 - 123				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,7,8,9-HxCDF	55		29 - 147				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,7,8-PeCDD	59		25 - 181				08/13/18 10:41	08/15/18 15:59	1
13C-1,2,3,7,8-PeCDF	55		24 - 185				08/13/18 10:41	08/15/18 15:59	1
13C-2,3,4,6,7,8-HxCDF	48		28 - 136				08/13/18 10:41	08/15/18 15:59	1
13C-2,3,4,7,8-PeCDF	53		21 - 178				08/13/18 10:41	08/15/18 15:59	1
13C-2,3,7,8-TCDD	54		25 - 164				08/13/18 10:41	08/15/18 15:59	1
13C-OCDD	46		17 - 157				08/13/18 10:41	08/15/18 15:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	97		35 - 197				08/13/18 10:41	08/15/18 15:59	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	0.0029		0.00095	0.00045	ug/Kg	✉	08/13/18 10:41	08/17/18 20:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	50		24 - 169				08/13/18 10:41	08/17/18 20:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	93		35 - 197				08/13/18 10:41	08/17/18 20:30	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-4to6

Date Collected: 07/27/18 13:00

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-3

Matrix: Solid

Percent Solids: 55.7

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HxCDD	0.22		0.0044	0.0029	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,4,6,7,8-HxCDF	0.099		0.0044	0.0017	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,4,7,8,9-HxCDF	0.0039 J	J	0.0044	0.0027	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,4,7,8-HxCDD	0.0017 J	J	0.0044	0.00037	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,4,7,8-HxCDF	0.0035 J	J	0.0044	0.00081	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,6,7,8-HxCDD	0.0075		0.0044	0.00034	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,6,7,8-HxCDF	0.011		0.0044	0.00073	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,7,8,9-HxCDD	0.0040 J	J	0.0044	0.00033	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,7,8,9-HxCDF	ND		0.0044	0.00050	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,7,8-PeCDD	0.00098 J	J	0.0044	0.00026	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
1,2,3,7,8-PeCDF	0.0014 J	J	0.0044	0.00037	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
2,3,4,6,7,8-HxCDF	0.0012 J	J	0.0044	0.00056	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
2,3,4,7,8-PeCDF	0.0012 J	J	0.0044	0.00043	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
2,3,7,8-TCDD	0.0013		0.00088	0.00013	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
OCDD	3.7 E B		0.0088	0.0021	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
OCDF	0.26		0.0088	0.00032	ug/Kg	✉	08/13/18 10:41	08/15/18 16:47	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HxCDD	47		23 - 140				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,4,6,7,8-HxCDF	38		28 - 143				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,4,7,8,9-HxCDF	42		26 - 138				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,4,7,8-HxCDD	51		32 - 141				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,4,7,8-HxCDF	46		26 - 152				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,6,7,8-HxCDD	46		28 - 130				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,6,7,8-HxCDF	40		26 - 123				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,7,8,9-HxCDF	56		29 - 147				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,7,8-PeCDD	68		25 - 181				08/13/18 10:41	08/15/18 16:47	1
13C-1,2,3,7,8-PeCDF	62		24 - 185				08/13/18 10:41	08/15/18 16:47	1
13C-2,3,4,6,7,8-HxCDF	46		28 - 136				08/13/18 10:41	08/15/18 16:47	1
13C-2,3,4,7,8-PeCDF	62		21 - 178				08/13/18 10:41	08/15/18 16:47	1
13C-2,3,7,8-TCDD	63		25 - 164				08/13/18 10:41	08/15/18 16:47	1
13C-OCDD	50		17 - 157				08/13/18 10:41	08/15/18 16:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	111		35 - 197				08/13/18 10:41	08/15/18 16:47	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	0.00087 J	J	0.00088	0.00041	ug/Kg	✉	08/13/18 10:41	08/17/18 21:08	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	55		24 - 169				08/13/18 10:41	08/17/18 21:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	94		35 - 197				08/13/18 10:41	08/17/18 21:08	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-6to8

Date Collected: 07/27/18 13:05

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-4

Matrix: Solid

Percent Solids: 56.0

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	0.32		0.0045	0.0031	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,4,6,7,8-HpCDF	0.089		0.0045	0.0015	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,4,7,8,9-HpCDF	0.0061		0.0045	0.0024	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,4,7,8-HxCDD	0.0030 J		0.0045	0.00040	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,4,7,8-HxCDF	0.015		0.0045	0.00082	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,6,7,8-HxCDD	0.012		0.0045	0.00037	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,6,7,8-HxCDF	0.011		0.0045	0.00072	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,7,8,9-HxCDD	0.0065		0.0045	0.00036	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,7,8,9-HxCDF	ND		0.0045	0.00066	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,7,8-PeCDD	0.0016 J		0.0045	0.00025	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
1,2,3,7,8-PeCDF	0.0075		0.0045	0.00038	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
2,3,4,6,7,8-HxCDF	0.0019 J		0.0045	0.00070	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
2,3,4,7,8-PeCDF	0.0036 J		0.0045	0.00040	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
2,3,7,8-TCDD	0.0017		0.00090	0.00016	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
OCDD	4.9 E B		0.0090	0.0023	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
OCDF	0.25		0.0090	0.00035	ug/Kg	✉	08/13/18 10:41	08/15/18 17:36	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	49		23 - 140				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,4,6,7,8-HpCDF	39		28 - 143				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,4,7,8,9-HpCDF	43		26 - 138				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,4,7,8-HxCDD	59		32 - 141				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,4,7,8-HxCDF	59		26 - 152				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,6,7,8-HxCDD	47		28 - 130				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,6,7,8-HxCDF	55		26 - 123				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,7,8,9-HxCDF	57		29 - 147				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,7,8-PeCDD	75		25 - 181				08/13/18 10:41	08/15/18 17:36	1
13C-1,2,3,7,8-PeCDF	72		24 - 185				08/13/18 10:41	08/15/18 17:36	1
13C-2,3,4,6,7,8-HxCDF	48		28 - 136				08/13/18 10:41	08/15/18 17:36	1
13C-2,3,4,7,8-PeCDF	73		21 - 178				08/13/18 10:41	08/15/18 17:36	1
13C-2,3,7,8-TCDD	58		25 - 164				08/13/18 10:41	08/15/18 17:36	1
13C-OCDD	65		17 - 157				08/13/18 10:41	08/15/18 17:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	99		35 - 197				08/13/18 10:41	08/15/18 17:36	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	0.0047		0.00090	0.00036	ug/Kg	✉	08/13/18 10:41	08/17/18 21:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	61		24 - 169				08/13/18 10:41	08/17/18 21:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	104		35 - 197				08/13/18 10:41	08/17/18 21:46	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-8to10

Date Collected: 07/27/18 13:10

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-5

Matrix: Solid

Percent Solids: 55.3

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

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.45		0.0044	0.0033	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,4,6,7,8-HpCDF	0.27		0.0044	0.0021	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,4,7,8,9-HpCDF	0.0084		0.0044	0.0034	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,4,7,8-HxCDD	0.0040 J		0.0044	0.00043	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,4,7,8-HxCDF	0.014		0.0044	0.0016	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,6,7,8-HxCDD	0.019		0.0044	0.00042	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,6,7,8-HxCDF	0.028		0.0044	0.0015	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,7,8,9-HxCDD	0.0080		0.0044	0.00039	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,7,8,9-HxCDF	ND		0.0044	0.0010	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,7,8-PeCDD	0.0019 J q		0.0044	0.00029	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
1,2,3,7,8-PeCDF	0.0063		0.0044	0.00056	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
2,3,4,6,7,8-HxCDF	0.0035 J		0.0044	0.0012	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
2,3,4,7,8-PeCDF	0.0043 J		0.0044	0.00084	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
2,3,7,8-TCDD	0.0011		0.00089	0.00013	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
OCDD	6.3 E B		0.0089	0.0033	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
OCDF	0.42		0.0089	0.00038	ug/Kg	✉	08/13/18 10:41	08/15/18 18:24	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	46		23 - 140				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,4,6,7,8-HpCDF	45		28 - 143				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,4,7,8,9-HpCDF	44		26 - 138				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,4,7,8-HxCDD	59		32 - 141				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,4,7,8-HxCDF	58		26 - 152				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,6,7,8-HxCDD	48		28 - 130				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,6,7,8-HxCDF	51		26 - 123				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,7,8,9-HxCDF	66		29 - 147				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,7,8-PeCDD	75		25 - 181				08/13/18 10:41	08/15/18 18:24	1
13C-1,2,3,7,8-PeCDF	71		24 - 185				08/13/18 10:41	08/15/18 18:24	1
13C-2,3,4,6,7,8-HxCDF	49		28 - 136				08/13/18 10:41	08/15/18 18:24	1
13C-2,3,4,7,8-PeCDF	60		21 - 178				08/13/18 10:41	08/15/18 18:24	1
13C-2,3,7,8-TCDD	58		25 - 164				08/13/18 10:41	08/15/18 18:24	1
13C-OCDD	64		17 - 157				08/13/18 10:41	08/15/18 18:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	96		35 - 197				08/13/18 10:41	08/15/18 18:24	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	0.0040		0.00089	0.00052	ug/Kg	✉	08/13/18 10:41	08/17/18 22:24	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	68		24 - 169				08/13/18 10:41	08/17/18 22:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	109		35 - 197				08/13/18 10:41	08/17/18 22:24	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-10to12.7

Date Collected: 07/27/18 13:15

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-6

Matrix: Solid

Percent Solids: 58.1

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	0.58		0.0042	0.0041	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,4,6,7,8-HpCDF	0.29	G	0.0044	0.0044	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,4,7,8,9-HpCDF	0.029		0.0042	0.0034	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,4,7,8-HxCDD	0.0053		0.0042	0.00069	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,4,7,8-HxCDF	0.10		0.0042	0.0015	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,6,7,8-HxCDD	0.022		0.0042	0.00074	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,6,7,8-HxCDF	0.032		0.0042	0.0014	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,7,8,9-HxCDD	0.0088		0.0042	0.00066	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,7,8,9-HxCDF	ND		0.0042	0.0018	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,7,8-PeCDD	0.0025	J	0.0042	0.00034	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
1,2,3,7,8-PeCDF	0.062		0.0042	0.0012	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
2,3,4,6,7,8-HxCDF	0.0068		0.0042	0.0013	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
2,3,4,7,8-PeCDF	0.027		0.0042	0.0013	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
2,3,7,8-TCDD	0.0023		0.00084	0.00017	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
OCDD	7.6	E B	0.0084	0.0033	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
OCDF	0.68		0.0084	0.00067	ug/Kg	✉	08/13/18 10:41	08/15/18 19:12	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	55		23 - 140				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,4,6,7,8-HpCDF	36		28 - 143				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,4,7,8,9-HpCDF	60		26 - 138				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,4,7,8-HxCDD	68		32 - 141				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,4,7,8-HxCDF	89		26 - 152				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,6,7,8-HxCDD	53		28 - 130				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,6,7,8-HxCDF	73		26 - 123				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,7,8,9-HxCDF	60		29 - 147				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,7,8-PeCDD	97		25 - 181				08/13/18 10:41	08/15/18 19:12	1
13C-1,2,3,7,8-PeCDF	76		24 - 185				08/13/18 10:41	08/15/18 19:12	1
13C-2,3,4,6,7,8-HxCDF	72		28 - 136				08/13/18 10:41	08/15/18 19:12	1
13C-2,3,4,7,8-PeCDF	86		21 - 178				08/13/18 10:41	08/15/18 19:12	1
13C-2,3,7,8-TCDD	59		25 - 164				08/13/18 10:41	08/15/18 19:12	1
13C-OCDD	67		17 - 157				08/13/18 10:41	08/15/18 19:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	103		35 - 197				08/13/18 10:41	08/15/18 19:12	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	0.037	G	0.0010	0.0010	ug/Kg	✉	08/13/18 10:41	08/17/18 23:02	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C-2,3,7,8-TCDF	73		24 - 169				08/13/18 10:41	08/17/18 23:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	113		35 - 197				08/13/18 10:41	08/17/18 23:02	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-12.7to13

Date Collected: 07/27/18 13:20

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-7

Matrix: Solid

Percent Solids: 71.8

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	0.0028	J	0.0034	0.00023	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,4,6,7,8-HpCDF	0.00034	J q	0.0034	0.00012	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,4,7,8,9-HpCDF	ND		0.0034	0.00017	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,4,7,8-HxCDD	0.00013	J	0.0034	0.000091	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,4,7,8-HxCDF	ND		0.0034	0.00010	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,6,7,8-HxCDD	0.00016	J q	0.0034	0.000096	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,6,7,8-HxCDF	ND		0.0034	0.00010	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,7,8,9-HxCDD	0.00035	J	0.0034	0.000087	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,7,8,9-HxCDF	ND		0.0034	0.000087	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,7,8-PeCDD	ND		0.0034	0.000092	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
1,2,3,7,8-PeCDF	ND		0.0034	0.000046	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
2,3,4,6,7,8-HxCDF	ND		0.0034	0.000080	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
2,3,4,7,8-PeCDF	ND		0.0034	0.000052	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
2,3,7,8-TCDD	ND		0.00068	0.000084	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
2,3,7,8-TCDF	0.00016	J q	0.00068	0.000057	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
OCDD	0.024	B	0.0068	0.00032	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
OCDF	0.00091	J q	0.0068	0.00024	ug/Kg	✉	08/13/18 10:41	08/15/18 20:01	1
Isotope Dilution	%Recovery	Qualifier		Limits			Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	31			23 - 140			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,4,6,7,8-HpCDF	28			28 - 143			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,4,7,8,9-HpCDF	36			26 - 138			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,4,7,8-HxCDD	69			32 - 141			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,4,7,8-HxCDF	69			26 - 152			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,6,7,8-HxCDD	45			28 - 130			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,6,7,8-HxCDF	55			26 - 123			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,7,8,9-HxCDF	60			29 - 147			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,7,8-PeCDD	84			25 - 181			08/13/18 10:41	08/15/18 20:01	1
13C-1,2,3,7,8-PeCDF	76			24 - 185			08/13/18 10:41	08/15/18 20:01	1
13C-2,3,4,6,7,8-HxCDF	58			28 - 136			08/13/18 10:41	08/15/18 20:01	1
13C-2,3,4,7,8-PeCDF	76			21 - 178			08/13/18 10:41	08/15/18 20:01	1
13C-2,3,7,8-TCDD	58			25 - 164			08/13/18 10:41	08/15/18 20:01	1
13C-2,3,7,8-TCDF	60			24 - 169			08/13/18 10:41	08/15/18 20:01	1
13C-OCDD	42			17 - 157			08/13/18 10:41	08/15/18 20:01	1
Surrogate	%Recovery	Qualifier		Limits			Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	96			35 - 197			08/13/18 10:41	08/15/18 20:01	1

TestAmerica Seattle

Client Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S251-2to2.5

Date Collected: 07/27/18 17:40

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-8

Matrix: Solid

Percent Solids: 72.9

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	0.065		0.0034	0.00050	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,4,6,7,8-HpCDF	0.0041		0.0034	0.00016	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,4,7,8,9-HpCDF	0.00027	J q	0.0034	0.00018	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,4,7,8-HxCDD	0.00077	J	0.0034	0.00024	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,4,7,8-HxCDF	0.00042	J	0.0034	0.00012	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,6,7,8-HxCDD	0.0079		0.0034	0.00022	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,6,7,8-HxCDF	0.00043	J	0.0034	0.00010	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,7,8,9-HxCDD	0.0021	J	0.0034	0.00021	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,7,8,9-HxCDF	ND		0.0034	0.000080	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,7,8-PeCDD	0.00028	J	0.0034	0.00013	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
1,2,3,7,8-PeCDF	ND		0.0034	0.000070	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
2,3,4,6,7,8-HxCDF	0.00018	J	0.0034	0.000075	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
2,3,4,7,8-PeCDD	ND		0.0034	0.000073	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
2,3,7,8-TCDD	ND		0.00067	0.00035	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
2,3,7,8-TCDF	0.00039	J q	0.00067	0.000047	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
OCDD	0.47	B	0.0067	0.00042	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
OCDF	0.013		0.0067	0.00023	ug/Kg	✉	08/13/18 10:41	08/15/18 20:49	1
Isotope Dilution	%Recovery	Qualifier		Limits			Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	37			23 - 140			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,4,6,7,8-HpCDF	28			28 - 143			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,4,7,8,9-HpCDF	40			26 - 138			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,4,7,8-HxCDD	59			32 - 141			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,4,7,8-HxCDF	50			26 - 152			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,6,7,8-HxCDD	47			28 - 130			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,6,7,8-HxCDF	45			26 - 123			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,7,8,9-HxCDF	54			29 - 147			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,7,8-PeCDD	70			25 - 181			08/13/18 10:41	08/15/18 20:49	1
13C-1,2,3,7,8-PeCDF	56			24 - 185			08/13/18 10:41	08/15/18 20:49	1
13C-2,3,4,6,7,8-HxCDF	52			28 - 136			08/13/18 10:41	08/15/18 20:49	1
13C-2,3,4,7,8-PeCDD	62			21 - 178			08/13/18 10:41	08/15/18 20:49	1
13C-2,3,7,8-TCDD	62			25 - 164			08/13/18 10:41	08/15/18 20:49	1
13C-2,3,7,8-TCDF	65			24 - 169			08/13/18 10:41	08/15/18 20:49	1
13C-OCDD	45			17 - 157			08/13/18 10:41	08/15/18 20:49	1
Surrogate	%Recovery	Qualifier		Limits			Prepared	Analyzed	Dil Fac
37Cl-2,3,7,8-TCDD	99			35 - 197			08/13/18 10:41	08/15/18 20:49	1

TestAmerica Seattle

QC Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

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

Lab Sample ID: MB 320-239564/1-A

Matrix: Solid

Analysis Batch: 240178

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 239564

Analyte	MB	MB	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac	
	Result	Qualifier								
1,2,3,4,6,7,8-HxCDD	ND		0.0050	0.00012	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,4,6,7,8-HxCDF	ND		0.0050	0.000069	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,4,7,8,9-HxCDF	ND		0.0050	0.000098	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,4,7,8-HxCDD	ND		0.0050	0.00011	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,4,7,8-HxCDF	ND		0.0050	0.00016	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,6,7,8-HxCDD	ND		0.0050	0.000096	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,6,7,8-HxCDF	ND		0.0050	0.00012	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,7,8,9-HxCDD	ND		0.0050	0.000095	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,7,8,9-HxCDF	ND		0.0050	0.000098	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,7,8-PeCDD	ND		0.0050	0.00016	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
1,2,3,7,8-PeCDF	ND		0.0050	0.00011	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
2,3,4,6,7,8-HxCDF	ND		0.0050	0.000095	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
2,3,4,7,8-PeCDF	ND		0.0050	0.00012	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
2,3,7,8-TCDD	ND		0.0010	0.000086	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
2,3,7,8-TCDF	ND		0.0010	0.000065	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
OCDD	0.000569	J	0.010	0.00013	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
OCDF	ND		0.010	0.00014	ug/Kg	08/13/18 10:41	08/15/18 12:45		1	
MB MB		MB MB		MB MB		MB MB		MB MB		
Isotope Dilution	%Recovery	Qualifier	Limits					Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HxCDD	65		23 - 140					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,4,6,7,8-HxCDF	65		28 - 143					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,4,7,8,9-HxCDF	72		26 - 138					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,4,7,8-HxCDD	67		32 - 141					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,4,7,8-HxCDF	57		26 - 152					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,6,7,8-HxCDD	72		28 - 130					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,6,7,8-HxCDF	56		26 - 123					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,7,8,9-HxCDF	70		29 - 147					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,7,8-PeCDD	73		25 - 181					08/13/18 10:41	08/15/18 12:45	1
13C-1,2,3,7,8-PeCDF	65		24 - 185					08/13/18 10:41	08/15/18 12:45	1
13C-2,3,4,6,7,8-HxCDF	64		28 - 136					08/13/18 10:41	08/15/18 12:45	1
13C-2,3,4,7,8-PeCDF	64		21 - 178					08/13/18 10:41	08/15/18 12:45	1
13C-2,3,7,8-TCDD	68		25 - 164					08/13/18 10:41	08/15/18 12:45	1
13C-2,3,7,8-TCDF	70		24 - 169					08/13/18 10:41	08/15/18 12:45	1
13C-OCDD	86		17 - 157					08/13/18 10:41	08/15/18 12:45	1
MB MB		MB MB		MB MB		MB MB		MB MB		
Surrogate	%Recovery	Qualifier	Limits					Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	101		35 - 197					08/13/18 10:41	08/15/18 12:45	1

Lab Sample ID: LCS 320-239564/2-A

Matrix: Solid

Analysis Batch: 240178

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 239564

Analyte	Spike	LCS	LCS	%Rec.			
	Added	Result	Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HxCDD	0.100	0.0987		ug/Kg	99	70 - 140	
1,2,3,4,6,7,8-HxCDF	0.100	0.100		ug/Kg	100	82 - 122	
1,2,3,4,7,8,9-HxCDF	0.100	0.100		ug/Kg	100	78 - 138	
1,2,3,4,7,8-HxCDD	0.100	0.108		ug/Kg	108	70 - 164	
1,2,3,4,7,8-HxCDF	0.100	0.100		ug/Kg	100	72 - 134	

TestAmerica Seattle

QC Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

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

Lab Sample ID: LCS 320-239564/2-A

Matrix: Solid

Analysis Batch: 240178

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 239564

%Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,6,7,8-HxCDD	0.100	0.0952		ug/Kg		95	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.100		ug/Kg		100	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.0995		ug/Kg		100	64 - 162
1,2,3,7,8,9-HxCDF	0.100	0.101		ug/Kg		101	78 - 130
1,2,3,7,8-PeCDD	0.100	0.0922		ug/Kg		92	70 - 142
1,2,3,7,8-PeCDF	0.100	0.100		ug/Kg		100	80 - 134
2,3,4,6,7,8-HxCDF	0.100	0.0998		ug/Kg		100	70 - 156
2,3,4,7,8-PeCDF	0.100	0.101		ug/Kg		101	68 - 160
2,3,7,8-TCDD	0.0200	0.0188		ug/Kg		94	67 - 158
2,3,7,8-TCDF	0.0200	0.0198		ug/Kg		99	75 - 158
OCDD	0.200	0.200		ug/Kg		100	78 - 144
OCDF	0.200	0.202		ug/Kg		101	63 - 170

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-1,2,3,4,6,7,8-HpCDD	68		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	63		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	74		20 - 186
13C-1,2,3,4,7,8-HxCDD	69		21 - 193
13C-1,2,3,4,7,8-HxCDF	62		19 - 202
13C-1,2,3,6,7,8-HxCDD	71		25 - 163
13C-1,2,3,6,7,8-HxCDF	59		21 - 159
13C-1,2,3,7,8,9-HxCDF	75		17 - 205
13C-1,2,3,7,8-PeCDD	84		21 - 227
13C-1,2,3,7,8-PeCDF	73		21 - 192
13C-2,3,4,6,7,8-HxCDF	71		22 - 176
13C-2,3,4,7,8-PeCDF	71		13 - 328
13C-2,3,7,8-TCDD	60		20 - 175
13C-2,3,7,8-TCDF	68		22 - 152
13C-OCDD	84		13 - 199

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

Lab Sample ID: LCSD 320-239564/3-A

Matrix: Solid

Analysis Batch: 240178

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 239564

%Rec.

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.0985		ug/Kg		98	70 - 140	0	50
1,2,3,4,6,7,8-HpCDF	0.100	0.101		ug/Kg		101	82 - 122	1	50
1,2,3,4,7,8,9-HpCDF	0.100	0.103		ug/Kg		103	78 - 138	2	50
1,2,3,4,7,8-HxCDD	0.100	0.101		ug/Kg		101	70 - 164	6	50
1,2,3,4,7,8-HxCDF	0.100	0.101		ug/Kg		101	72 - 134	1	50
1,2,3,6,7,8-HxCDD	0.100	0.104		ug/Kg		104	76 - 134	9	50
1,2,3,6,7,8-HxCDF	0.100	0.100		ug/Kg		100	84 - 130	0	50
1,2,3,7,8,9-HxCDD	0.100	0.105		ug/Kg		105	64 - 162	5	50
1,2,3,7,8,9-HxCDF	0.100	0.0975		ug/Kg		98	78 - 130	3	50
1,2,3,7,8-PeCDD	0.100	0.0891		ug/Kg		89	70 - 142	3	50

TestAmerica Seattle

QC Sample Results

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

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

Lab Sample ID: LCSD 320-239564/3-A

Matrix: Solid

Analysis Batch: 240178

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 239564

%Rec.

RPD

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,2,3,7,8-PeCDF	0.100	0.100		ug/Kg		100	80 - 134	0	50
2,3,4,6,7,8-HxCDF	0.100	0.100		ug/Kg		100	70 - 156	1	50
2,3,4,7,8-PeCDF	0.100	0.102		ug/Kg		102	68 - 160	1	50
2,3,7,8-TCDD	0.0200	0.0184		ug/Kg		92	67 - 158	2	50
2,3,7,8-TCDF	0.0200	0.0195		ug/Kg		98	75 - 158	1	50
OCDD	0.200	0.200		ug/Kg		100	78 - 144	0	50
OCDF	0.200	0.209		ug/Kg		104	63 - 170	3	50

Isotope Dilution	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	78		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	67		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	81		20 - 186
13C-1,2,3,4,7,8-HxCDD	68		21 - 193
13C-1,2,3,4,7,8-HxCDF	61		19 - 202
13C-1,2,3,6,7,8-HxCDD	67		25 - 163
13C-1,2,3,6,7,8-HxCDF	59		21 - 159
13C-1,2,3,7,8,9-HxCDF	73		17 - 205
13C-1,2,3,7,8-PeCDD	79		21 - 227
13C-1,2,3,7,8-PeCDF	75		21 - 192
13C-2,3,4,6,7,8-HxCDF	65		22 - 176
13C-2,3,4,7,8-PeCDF	66		13 - 328
13C-2,3,7,8-TCDD	68		20 - 175
13C-2,3,7,8-TCDF	68		22 - 152
13C-OCDD	96		13 - 199

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
37Cl-2,3,7,8-TCDD	98		31 - 191

TestAmerica Seattle

Lab Chronicle

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-0to2

Date Collected: 07/27/18 12:50

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-1

Matrix: Solid

Percent Solids: 52.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	240639	08/17/18 19:52	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 15:11	ALM	TAL SAC

Client Sample ID: PDI-SC-S163-2to4

Date Collected: 07/27/18 12:55

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-2

Matrix: Solid

Percent Solids: 52.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	240639	08/17/18 20:30	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 15:59	ALM	TAL SAC

Client Sample ID: PDI-SC-S163-4to6

Date Collected: 07/27/18 13:00

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-3

Matrix: Solid

Percent Solids: 55.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	240639	08/17/18 21:08	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 16:47	ALM	TAL SAC

Client Sample ID: PDI-SC-S163-6to8

Date Collected: 07/27/18 13:05

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-4

Matrix: Solid

Percent Solids: 56.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	240639	08/17/18 21:46	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 17:36	ALM	TAL SAC

Client Sample ID: PDI-SC-S163-8to10

Date Collected: 07/27/18 13:10

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-5

Matrix: Solid

Percent Solids: 55.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	240639	08/17/18 22:24	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC

TestAmerica Seattle

Lab Chronicle

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Client Sample ID: PDI-SC-S163-8to10

Date Collected: 07/27/18 13:10

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-5

Matrix: Solid

Percent Solids: 55.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	1613B		1	240178	08/15/18 18:24	ALM	TAL SAC

Client Sample ID: PDI-SC-S163-10to12.7

Date Collected: 07/27/18 13:15

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-6

Matrix: Solid

Percent Solids: 58.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox	RA		239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B	RA	1	240639	08/17/18 23:02	AS	TAL SAC
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 19:12	ALM	TAL SAC

Client Sample ID: PDI-SC-S163-12.7to13

Date Collected: 07/27/18 13:20

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-7

Matrix: Solid

Percent Solids: 71.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 20:01	ALM	TAL SAC

Client Sample ID: PDI-SC-S251-2to2.5

Date Collected: 07/27/18 17:40

Date Received: 07/30/18 13:40

Lab Sample ID: 580-79203-8

Matrix: Solid

Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			239564	08/13/18 10:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	240178	08/15/18 20:49	ALM	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

TestAmerica Seattle

Accreditation/Certification Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Laboratory: TestAmerica Seattle

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	11-06-18
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

TestAmerica Seattle

Sample Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79203-1	PDI-SC-S163-0to2	Solid	07/27/18 12:50	07/30/18 13:40
580-79203-2	PDI-SC-S163-2to4	Solid	07/27/18 12:55	07/30/18 13:40
580-79203-3	PDI-SC-S163-4to6	Solid	07/27/18 13:00	07/30/18 13:40
580-79203-4	PDI-SC-S163-6to8	Solid	07/27/18 13:05	07/30/18 13:40
580-79203-5	PDI-SC-S163-8to10	Solid	07/27/18 13:10	07/30/18 13:40
580-79203-6	PDI-SC-S163-10to12.7	Solid	07/27/18 13:15	07/30/18 13:40
580-79203-7	PDI-SC-S163-12.7to13	Solid	07/27/18 13:20	07/30/18 13:40
580-79203-8	PDI-SC-S251-2to2.5	Solid	07/27/18 17:40	07/30/18 13:40

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047		<h3 style="text-align: center;">SUBSURFACE SEDIMENT CHAIN OF CUSTODY</h3> <p>Client Contact</p> <p>Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010</p> <p>Analysis Turnaround Time</p> <p>Calendar (C) or Work Days (W) W</p> <p><input checked="" type="checkbox"/> 21 days</p> <p><input type="checkbox"/> Other _____</p> <p>Site Contact: Jennifer Ray / Michaela McCool Laboratory Contact: Elaine-Walker Date: 7/30/18 Carrier: Courier</p> <p>COC No: 1 1 of 1 pages</p> <p>Fraction: PCDDEPs 163B Archive: Grain size: ASTM D7920/D6913 PCB Analogs, PAHs, Total Organic Carbon, Total Solids 8087A, 82700-SIM, 9066, 160,3 Attarberg Limits ASTM D4318</p> <p>580-79203 Chain of Custody</p> <p>Sample Specific Notes:</p>																																																																								
<p>Sample Identification</p> <table border="1"> <thead> <tr> <th></th> <th>Sample Date</th> <th>Sample Time</th> <th>Matrix</th> <th>QC Sample</th> <th>Sampler's Initials</th> <th>Total No. of Cont.</th> </tr> </thead> <tbody> <tr> <td>PDI-SC-S163 - 0 to 2</td> <td>7/27/2018</td> <td>12:50</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>PDI-SC-S163 - 2 to 4</td> <td>7/27/2018</td> <td>12:55</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>PDI-SC-S163 - 4 to 6</td> <td>7/27/2018</td> <td>13:00</td> <td>SC</td> <td>MS/MSD</td> <td></td> <td>6</td> </tr> <tr> <td>PDI-SC-S163 - 6 to 8</td> <td>7/27/2018</td> <td>13:05</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>PDI-SC-S163 - 8 to 10</td> <td>7/27/2018</td> <td>13:10</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>PDI-SC-S163 - 10 to 12.7</td> <td>7/27/2018</td> <td>13:15</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>PDI-SC-S163 - 12.7 to 13</td> <td>7/27/2018</td> <td>13:20</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td>PDI-SC-S251 - 2 to 2.5</td> <td>7/27/2018</td> <td>17:40</td> <td>SC</td> <td></td> <td></td> <td>4</td> </tr> </tbody> </table>			Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	PDI-SC-S163 - 0 to 2	7/27/2018	12:50	SC			4	PDI-SC-S163 - 2 to 4	7/27/2018	12:55	SC			4	PDI-SC-S163 - 4 to 6	7/27/2018	13:00	SC	MS/MSD		6	PDI-SC-S163 - 6 to 8	7/27/2018	13:05	SC			4	PDI-SC-S163 - 8 to 10	7/27/2018	13:10	SC			4	PDI-SC-S163 - 10 to 12.7	7/27/2018	13:15	SC			4	PDI-SC-S163 - 12.7 to 13	7/27/2018	13:20	SC			4	PDI-SC-S251 - 2 to 2.5	7/27/2018	17:40	SC			4										
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PDI-SC-S163 - 6 to 8	7/27/2018	13:05	SC			4																																																																				
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PDI-SC-S163 - 10 to 12.7	7/27/2018	13:15	SC			4																																																																				
PDI-SC-S163 - 12.7 to 13	7/27/2018	13:20	SC			4																																																																				
PDI-SC-S251 - 2 to 2.5	7/27/2018	17:40	SC			4																																																																				
<p>Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Container Preservative: HCl = Hydrochloric Acid, H₃PO₄ = Phosphoric Acid, HNO₃ = Nitric Acid Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered)</p> <p>Sample Disposal</p> <p><input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input checked="" type="checkbox"/> Archive For 12 Months</p>																																																																										
<p>Special Instructions/QC Requirements & Comments: Separate reports for each lab</p> <p style="text-align: right;">2.7</p>																																																																										
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:																																																																					
		7/30/18 / 1305			7-30-18 / 1305																																																																					
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Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:																																																																					
		7/30/18 1702			7/31/18 0930																																																																					

$$TK5 = 1.4 / 1.4 \text{ N/C-S}$$



Chain of Custody Record

uctions will be provided. Any changes to accreditation status should be brought to TestAmerica Inc.

Return To Client Disposal By Lab Archive For _____
Special Instructions/LOC Requirements:

Time:	Received by:	Method of Shipment:
<u>any</u>	<u>Melinda</u>	Date/Tim <u>7/1</u>
any	Received by:	Date/Tim
	<u>any</u>	Date/Tim

Custody Seal No.:
Custody Seals Intact:
 Yes No

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79203-2

Login Number: 79203

List Source: TestAmerica Seattle

List Number: 1

Creator: O'Connell, Jason I

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: 580-79203-2

Login Number: 79203

List Source: TestAmerica Sacramento

List Number: 2

List Creation: 07/31/18 11:15 AM

Creator: Gooch, Mayce

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	3.7c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



THE LEADER IN ENVIRONMENTAL TESTING

Sacramento Sample Receiving Notes



580-79203 Field Sheet

Jot

Tracking # 4423 0750 7811

SO / PO / FO / 2-Day / Ground / UPS / Courier / GSO /

OnTrac / Goldstreak / USPS / Other

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

WF1K @ 11:25

**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: 580-79203-2

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

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HxCDD (23-140)	HxCDF (28-143)	HxCDF2 (26-138)	HxCDD (32-141)	HxCDF (26-152)	HxD (28-130)	HxDF (26-123)	HxCF (29-147)
580-79203-1	PDI-SC-S163-0to2	58	45	55	51	48	55	45	55
580-79203-1 - RA	PDI-SC-S163-0to2								
580-79203-2	PDI-SC-S163-2to4	45	34	35	54	46	48	43	55
580-79203-2 - RA	PDI-SC-S163-2to4								
580-79203-3	PDI-SC-S163-4to6	47	38	42	51	46	46	40	56
580-79203-3 - RA	PDI-SC-S163-4to6								
580-79203-4	PDI-SC-S163-6to8	49	39	43	59	59	47	55	57
580-79203-4 - RA	PDI-SC-S163-6to8								
580-79203-5	PDI-SC-S163-8to10	46	45	44	59	58	48	51	66
580-79203-5 - RA	PDI-SC-S163-8to10								
580-79203-6	PDI-SC-S163-10to12.7	55	36	60	68	89	53	73	60
580-79203-6 - RA	PDI-SC-S163-10to12.7								
580-79203-7	PDI-SC-S163-12.7to13	31	28	36	69	69	45	55	60
580-79203-8	PDI-SC-S251-2to2.5	37	28	40	59	50	47	45	54
MB 320-239564/1-A	Method Blank	65	65	72	67	57	72	56	70
Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)	
580-79203-1	PDI-SC-S163-0to2	63	61	50	57	59	70		
580-79203-1 - RA	PDI-SC-S163-0to2							54	
580-79203-2	PDI-SC-S163-2to4	59	55	48	53	54		46	
580-79203-2 - RA	PDI-SC-S163-2to4							50	
580-79203-3	PDI-SC-S163-4to6	68	62	46	62	63		50	
580-79203-3 - RA	PDI-SC-S163-4to6							55	
580-79203-4	PDI-SC-S163-6to8	75	72	48	73	58		65	
580-79203-4 - RA	PDI-SC-S163-6to8							61	
580-79203-5	PDI-SC-S163-8to10	75	71	49	60	58		64	
580-79203-5 - RA	PDI-SC-S163-8to10							68	
580-79203-6	PDI-SC-S163-10to12.7	97	76	72	86	59		67	
580-79203-6 - RA	PDI-SC-S163-10to12.7							73	
580-79203-7	PDI-SC-S163-12.7to13	84	76	58	76	58	60	42	
580-79203-8	PDI-SC-S251-2to2.5	70	56	52	62	62	65	45	
MB 320-239564/1-A	Method Blank	73	65	64	64	68	70	86	

Surrogate Legend

HxCDD = 13C-1,2,3,4,6,7,8-HxCDD

HxCDF = 13C-1,2,3,4,6,7,8-HxCDF

HxCDF2 = 13C-1,2,3,4,7,8,9-HxCDF2

HxCDD = 13C-1,2,3,4,7,8-HxCDD

HxCDF = 13C-1,2,3,4,7,8-HxCDF

HxD = 13C-1,2,3,6,7,8-HxD

HxD = 13C-1,2,3,6,7,8-HxD

HxCF = 13C-1,2,3,7,8-HxCF

PeCDD = 13C-1,2,3,7,8-PeCDD

PeCDF = 13C-1,2,3,7,8-PeCDF

13CHxCF = 13C-2,3,4,6,7,8-13CHxCF

PeCF = 13C-2,3,4,7,8-PeCF

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

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

TestAmerica Seattle

Isotope Dilution Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-79203-2

OCDD = 13C-OCDD

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

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		HxCDD (26-166)	HxCDF (21-158)	HxCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxD (25-163)	HxD (21-159)	HxCF (17-205)
LCS 320-239564/2-A	Lab Control Sample	68	63	74	69	62	71	59	75
LCSD 320-239564/3-A	Lab Control Sample Dup	78	67	81	68	61	67	59	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)	
		84	73	71	71	60	68	84	
LCS 320-239564/2-A	Lab Control Sample	79	75	65	66	68	68	96	
Surrogate Legend									
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD									
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF									
HxCDF2 = 13C-1,2,3,4,7,8,9-HxCDF2									
HxCDD = 13C-1,2,3,4,7,8-HxCDD									
HxD = 13C-1,2,3,6,7,8-HxD									
HxF = 13C-1,2,3,6,7,8-HxF									
HxCF = 13C-1,2,3,7,8,9-HxCF									
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-PeCF									
TCDD = 13C-2,3,7,8-TCDD									
TCDF = 13C-2,3,7,8-TCDF									
OCDD = 13C-OCDD									

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