

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-78854-8

Client Project/Site: Portland Harbor Pre-Remedial Design

For:

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M. Elaine Walker

Authorized for release by:
10/26/2018 12:09:12 PM

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

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Case Narrative

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

TestAmerica Job ID: 580-78854-8

Job ID: 580-78854-8

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Portland Harbor Pre-Remedial Design

Report Number: 580-78854-8

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

Two samples were received on 7/16/2018 12:50 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

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

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

The following sample was activated for the remaining on hold analysis by the client on 10/11/18: PDI-SG-S266 (580-78854-2).

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

Sample PDI-SG-S266 (580-78854-2) was analyzed for Dioxin/ Furan in accordance with 1613B. The sample was prepared on 10/12/2018 and analyzed on 10/24/2018.

Several analytes were detected in method blank MB 320-251687/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

EPA Method 1613B specifies a +/- 15 second retention time difference between the recovery standard in the initial calibration (ICAL) and the continuing calibration verification (CCV). The 13C-1,2,3,4-TCDD and 13C-1,2,3,7,8,9-HxCDD associated with the following samples run on instrument 10D5 exceeded this criteria: PDI-SG-S266 (580-78854-2), (CCV 320-254637/14), (LCS 320-251687/2-A), (LCSD 320-251687/3-A) and (MB 320-251687/1-A). This retention time shift is due to normal and reasonable column maintenance and does not affect the instrument chromatography resolution, sensitivity, or identification of target analytes. System retention times have been updated for proper analyte identification.

Due to the matrix, the initial volume used for the following sample deviated from the standard procedure: PDI-SG-S266 (580-78854-2). The reporting limits (RLs) have been adjusted proportionately. The sample is associated with preparation batch 320-251687.

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: 580-78854-8

Qualifiers

Dioxin

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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: 580-78854-8

Client Sample ID: PDI-SG-S266

Lab Sample ID: 580-78854-2

Date Collected: 07/13/18 12:10

Matrix: Solid

Date Received: 07/16/18 12:50

Percent Solids: 68.9

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	0.010	B	0.0036	0.00014	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,4,6,7,8-HpCDF	0.0022	J B	0.0036	0.000069	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,4,7,8,9-HpCDF	0.00036	J B	0.0036	0.000088	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,4,7,8-HxCDD	0.00032	J B	0.0036	0.000036	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,4,7,8-HxCDF	ND		0.0036	0.000089	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,6,7,8-HxCDD	0.00055	J B	0.0036	0.000034	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,6,7,8-HxCDF	ND		0.0036	0.000089	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,7,8,9-HxCDD	0.00056	J B	0.0036	0.000033	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,7,8,9-HxCDF	0.00084	J B	0.0036	0.000048	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,7,8-PeCDD	0.00016	J q B	0.0036	0.000027	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
1,2,3,7,8-PeCDF	0.00024	J B	0.0036	0.000034	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
2,3,4,6,7,8-HxCDF	0.00012	J B	0.0036	0.000051	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
2,3,4,7,8-PeCDF	0.00013	J B	0.0036	0.000034	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
2,3,7,8-TCDD	0.00015	J q	0.00072	0.000023	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
2,3,7,8-TCDF	0.00023	J q B	0.00072	0.000011	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
OCDD	0.081	B	0.0072	0.00011	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1
OCDF	0.0066	J B	0.0072	0.000031	ug/Kg	☼	10/12/18 11:41	10/24/18 11:53	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	52		23 - 140	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,4,6,7,8-HpCDF	47		28 - 143	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,4,7,8,9-HpCDF	54		26 - 138	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,4,7,8-HxCDD	49		32 - 141	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,4,7,8-HxCDF	46		26 - 152	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,6,7,8-HxCDD	54		28 - 130	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,6,7,8-HxCDF	47		26 - 123	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,7,8,9-HxCDF	55		29 - 147	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,7,8-PeCDD	57		25 - 181	10/12/18 11:41	10/24/18 11:53	1
13C-1,2,3,7,8-PeCDF	58		24 - 185	10/12/18 11:41	10/24/18 11:53	1
13C-2,3,4,6,7,8-HxCDF	50		28 - 136	10/12/18 11:41	10/24/18 11:53	1
13C-2,3,4,7,8-PeCDF	61		21 - 178	10/12/18 11:41	10/24/18 11:53	1
13C-2,3,7,8-TCDD	61		25 - 164	10/12/18 11:41	10/24/18 11:53	1
13C-2,3,7,8-TCDF	65		24 - 169	10/12/18 11:41	10/24/18 11:53	1
13C-OCDD	50		17 - 157	10/12/18 11:41	10/24/18 11:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	97		35 - 197	10/12/18 11:41	10/24/18 11:53	1

QC Sample Results

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

TestAmerica Job ID: 580-78854-8

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

Lab Sample ID: MB 320-251687/1-A

Matrix: Solid

Analysis Batch: 254637

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 251687

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000273	J	0.0050	0.000025	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,4,6,7,8-HpCDF	0.000177	J	0.0050	0.000016	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,4,7,8,9-HpCDF	0.000265	J	0.0050	0.000023	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,4,7,8-HxCDD	0.000145	J q	0.0050	0.000016	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,4,7,8-HxCDF	0.0000804	J	0.0050	0.000050	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,6,7,8-HxCDD	0.0000289	J q	0.0050	0.000015	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,6,7,8-HxCDF	ND		0.0050	0.000049	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,7,8,9-HxCDD	0.0000550	J q	0.0050	0.000015	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,7,8,9-HxCDF	0.00110	J	0.0050	0.000029	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,7,8-PeCDD	0.0000409	J	0.0050	0.000022	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
1,2,3,7,8-PeCDF	0.000214	J	0.0050	0.000022	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
2,3,4,6,7,8-HxCDF	0.0000812	J	0.0050	0.000030	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
2,3,4,7,8-PeCDF	0.000107	J	0.0050	0.000024	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
2,3,7,8-TCDD	ND		0.0010	0.000021	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
2,3,7,8-TCDF	0.000266	J	0.0010	0.0000096	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
OCDD	0.00473	J	0.010	0.000045	ug/Kg		10/12/18 11:41	10/24/18 09:35	1
OCDF	0.000520	J	0.010	0.000021	ug/Kg		10/12/18 11:41	10/24/18 09:35	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-1,2,3,4,6,7,8-HpCDD	85		23 - 140	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,4,6,7,8-HpCDF	85		28 - 143	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,4,7,8,9-HpCDF	85		26 - 138	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,4,7,8-HxCDD	70		32 - 141	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,4,7,8-HxCDF	68		26 - 152	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,6,7,8-HxCDD	80		28 - 130	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,6,7,8-HxCDF	71		26 - 123	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,7,8,9-HxCDF	80		29 - 147	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,7,8-PeCDD	78		25 - 181	10/12/18 11:41	10/24/18 09:35	1
13C-1,2,3,7,8-PeCDF	78		24 - 185	10/12/18 11:41	10/24/18 09:35	1
13C-2,3,4,6,7,8-HxCDF	72		28 - 136	10/12/18 11:41	10/24/18 09:35	1
13C-2,3,4,7,8-PeCDF	78		21 - 178	10/12/18 11:41	10/24/18 09:35	1
13C-2,3,7,8-TCDD	77		25 - 164	10/12/18 11:41	10/24/18 09:35	1
13C-2,3,7,8-TCDF	78		24 - 169	10/12/18 11:41	10/24/18 09:35	1
13C-OCDD	97		17 - 157	10/12/18 11:41	10/24/18 09:35	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
37Cl4-2,3,7,8-TCDD	100		35 - 197	10/12/18 11:41	10/24/18 09:35	1

Lab Sample ID: LCS 320-251687/2-A

Matrix: Solid

Analysis Batch: 254637

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 251687

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,4,6,7,8-HpCDD	0.100	0.102		ug/Kg		102	70 - 140
1,2,3,4,6,7,8-HpCDF	0.100	0.0991		ug/Kg		99	82 - 122
1,2,3,4,7,8,9-HpCDF	0.100	0.0990		ug/Kg		99	78 - 138
1,2,3,4,7,8-HxCDD	0.100	0.0970		ug/Kg		97	70 - 164
1,2,3,4,7,8-HxCDF	0.100	0.0966		ug/Kg		97	72 - 134

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-78854-8

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

Lab Sample ID: LCS 320-251687/2-A
Matrix: Solid
Analysis Batch: 254637

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251687

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
1,2,3,6,7,8-HxCDD	0.100	0.102		ug/Kg		102	76 - 134
1,2,3,6,7,8-HxCDF	0.100	0.0965		ug/Kg		96	84 - 130
1,2,3,7,8,9-HxCDD	0.100	0.103		ug/Kg		103	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	0.0999		ug/Kg		100	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	0.0963		ug/Kg		96	70 - 156
2,3,4,7,8-PeCDF	0.100	0.101		ug/Kg		101	68 - 160
2,3,7,8-TCDD	0.0200	0.0197		ug/Kg		98	67 - 158
2,3,7,8-TCDF	0.0200	0.0189		ug/Kg		94	75 - 158
OCDD	0.200	0.196		ug/Kg		98	78 - 144
OCDF	0.200	0.185		ug/Kg		93	63 - 170

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	83		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	83		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	84		20 - 186
13C-1,2,3,4,7,8-HxCDD	72		21 - 193
13C-1,2,3,4,7,8-HxCDF	67		19 - 202
13C-1,2,3,6,7,8-HxCDD	75		25 - 163
13C-1,2,3,6,7,8-HxCDF	68		21 - 159
13C-1,2,3,7,8,9-HxCDF	78		17 - 205
13C-1,2,3,7,8-PeCDD	77		21 - 227
13C-1,2,3,7,8-PeCDF	77		21 - 192
13C-2,3,4,6,7,8-HxCDF	70		22 - 176
13C-2,3,4,7,8-PeCDF	77		13 - 328
13C-2,3,7,8-TCDD	76		20 - 175
13C-2,3,7,8-TCDF	77		22 - 152
13C-OCDD	93		13 - 199

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	96		31 - 191

Lab Sample ID: LCSD 320-251687/3-A
Matrix: Solid
Analysis Batch: 254637

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 251687

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	
								RPD	Limit
1,2,3,4,6,7,8-HpCDD	0.100	0.101		ug/Kg		101	70 - 140	0	50
1,2,3,4,6,7,8-HpCDF	0.100	0.102		ug/Kg		102	82 - 122	3	50
1,2,3,4,7,8,9-HpCDF	0.100	0.102		ug/Kg		102	78 - 138	3	50
1,2,3,4,7,8-HxCDD	0.100	0.0997		ug/Kg		100	70 - 164	3	50
1,2,3,4,7,8-HxCDF	0.100	0.0991		ug/Kg		99	72 - 134	3	50
1,2,3,6,7,8-HxCDD	0.100	0.103		ug/Kg		103	76 - 134	1	50
1,2,3,6,7,8-HxCDF	0.100	0.0987		ug/Kg		99	84 - 130	2	50
1,2,3,7,8,9-HxCDD	0.100	0.106		ug/Kg		106	64 - 162	3	50
1,2,3,7,8,9-HxCDF	0.100	0.103		ug/Kg		103	78 - 130	2	50
1,2,3,7,8-PeCDD	0.100	0.100		ug/Kg		100	70 - 142	0	50

TestAmerica Seattle

QC Sample Results

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

TestAmerica Job ID: 580-78854-8

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

Lab Sample ID: LCSD 320-251687/3-A
Matrix: Solid
Analysis Batch: 254637

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 251687

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2,3,7,8-PeCDF	0.100	0.105		ug/Kg		105	80 - 134	4	50
2,3,4,6,7,8-HxCDF	0.100	0.0973		ug/Kg		97	70 - 156	1	50
2,3,4,7,8-PeCDF	0.100	0.103		ug/Kg		103	68 - 160	2	50
2,3,7,8-TCDD	0.0200	0.0201		ug/Kg		101	67 - 158	2	50
2,3,7,8-TCDF	0.0200	0.0193		ug/Kg		96	75 - 158	2	50
OCDD	0.200	0.200		ug/Kg		100	78 - 144	2	50
OCDF	0.200	0.187		ug/Kg		93	63 - 170	1	50

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C-1,2,3,4,6,7,8-HpCDD	83		26 - 166
13C-1,2,3,4,6,7,8-HpCDF	81		21 - 158
13C-1,2,3,4,7,8,9-HpCDF	82		20 - 186
13C-1,2,3,4,7,8-HxCDD	70		21 - 193
13C-1,2,3,4,7,8-HxCDF	66		19 - 202
13C-1,2,3,6,7,8-HxCDD	74		25 - 163
13C-1,2,3,6,7,8-HxCDF	66		21 - 159
13C-1,2,3,7,8,9-HxCDF	78		17 - 205
13C-1,2,3,7,8-PeCDD	77		21 - 227
13C-1,2,3,7,8-PeCDF	73		21 - 192
13C-2,3,4,6,7,8-HxCDF	70		22 - 176
13C-2,3,4,7,8-PeCDF	73		13 - 328
13C-2,3,7,8-TCDD	74		20 - 175
13C-2,3,7,8-TCDF	74		22 - 152
13C-OCDD	90		13 - 199

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
37Cl4-2,3,7,8-TCDD	95		31 - 191

Lab Chronicle

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

TestAmerica Job ID: 580-78854-8

Client Sample ID: PDI-SG-S266

Lab Sample ID: 580-78854-2

Date Collected: 07/13/18 12:10

Matrix: Solid

Date Received: 07/16/18 12:50

Percent Solids: 68.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	HRMS-Sox			251687	10/12/18 11:41	SR1	TAL SAC
Total/NA	Analysis	1613B		1	254637	10/24/18 11:53	AS	TAL SAC

Laboratory References:

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

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Accreditation/Certification Summary

Client: AECOM

TestAmerica Job ID: 580-78854-8

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
Nevada	State Program	9	WA000502019-1	07-31-19
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	12-31-20
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

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

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

TestAmerica Job ID: 580-78854-8

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78854-2	PDI-SG-S266	Solid	07/13/18 12:10	07/16/18 12:50

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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
 Sample Type: D/U

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

Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.
7/13/2018	14:50	SS		LS	8
7/13/2018	12:10	SS		LS	7

Fracton	PCB Congeners 168A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx	Grain Size ASTM D7928/D6913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LI, Kron/Unger	Airberg Limits ASTM D4318	WQ - PCB Congeners 168A	WQ - PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx	WQ - Total Organic Carbon SMS310B	WQ - PAHs 8270-SIM	WQ - BEHP EPA 8270D-LI	WQ - Tributyltin Kron/Unger
	H	H	x*	x*	x*	H	H	H							

Carrier: Courier
 7/16/2018
 1 of 1 pages

Site Contact: Jennifer Ray
Laboratory Contact: Elaine-Walker

Sample Disposal
 Return To Client Disposal By Lab Archive For 12 Months

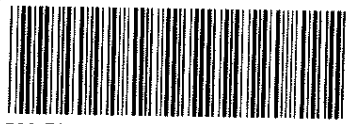
Container Type: WMG=Wide Mouth Glass Jar, P=HDPE, PP=Polypropylene, AG=amber glass, G=glass, RC=Resin Column
Preservative: HCl = Hydrochloric Acid, H3PO4 = Phosphoric Acid, HNO3 = Nitric Acid
Fracton: D = Dissolved, PRT = Particulate, T = Total (unfiltered)

Special Instructions/QC Requirements & Comments:
 Separate reports for each lab.
 x* - Analyze for grain size, metals (6020B analytes only), Mn, and TOC (9060 @ 104C & 70C) ASAP.
 H - Hold analyses pending further instruction.

Relinquished by:	Relinquished by:	Relinquished by:
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
Company: AECOM	Company: M.E.	Company: M.E.
Date/Time: 7/16/18 12:10	Date/Time: 7/16/18 12:50	Date/Time: 7/16/18 12:10



TestAmerica-Seattle		SURFACE SEDIMENT CHAIN OF CUSTODY																						
5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047		Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010					Site Contact: Jennifer Ray Laboratory Contact: Elaine-Walker					7/16/2018	COC No: 1											
Client Contact		Analysis Turnaround Time																						
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 Type: D/U		Calendar (C) or Work Days (W) <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> Other ASAP _____																						
Carrier: Courier		1 of 1 pages																						
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 (104C & 70C)	Archive Archive -20 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Kron/Unger	Alterberg Limits ASTM D4318	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	WQ - Total Organic Carbon SMO310B	WQ - PAHs 8270-SIM	WQ - BEHP EPA 8270D-LL	WQ - Tributyltin Kron/Unger	Sample Specific Notes:	
PDI-SG-B483	7/13/2018	14:50	SS		LS	8		H	H	x*	x*	x*	H	H	H									
PDI-SG-B487	7/13/2018	12:10	SS		LS	17		H	H	x*	x*	x*	H	H										



580-78854 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 Disposal By Lab Archive For 12 Months

Special Instructions/QC Requirements & Comments:

Separate reports for each lab.
x* - Analyze for grain size, metals (6020B analytes only), Mn, and TOC (9060 @ 104C & 70C) ASAP.
H - Hold analyses pending further instruction.

125

Relinquished by: <i>[Signature]</i>	Company: AECOM	Date/Time: 7/16/18 1210	Received by: <i>[Signature]</i>	Company: M.E.	Date/Time: 7/16/18 1210
Relinquished by: <i>[Signature]</i>	Company: M.E.	Date/Time: 7/16/18 1250	Received by: <i>[Signature]</i>	Company: TACOR	Date/Time: 7/16/18 1250
Relinquished by: <i>[Signature]</i>	Company: TACOR	Date/Time: 7/16/18 1700	Received by: <i>[Signature]</i>	Company: SEA TA	Date/Time: 7/17/18 0930

PKS = 0.710.7 w/c.s.

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78854-8

Login Number: 78854

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: 580-78854-8

Login Number: 78854

List Number: 3

Creator: Her, David A

List Source: TestAmerica Sacramento

List Creation: 07/17/18 12:23 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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	4.5c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
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: 580-78854-8

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)
580-78854-2	PDI-SG-S266	52	47	54	49	46	54	47	55
MB 320-251687/1-A	Method Blank	85	85	85	70	68	80	71	80

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCDD (25-181)	PeCDF (24-185)	13CHxCF (28-136)	PeCF (21-178)	TCDD (25-164)	TCDF (24-169)	OCDD (17-157)
580-78854-2	PDI-SG-S266	57	58	50	61	61	65	50
MB 320-251687/1-A	Method Blank	78	78	72	78	77	78	97

Surrogate Legend

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

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

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HpCDD (26-166)	HpCDF (21-158)	HpCDF2 (20-186)	HxCDD (21-193)	HxCDF (19-202)	HxDD (25-163)	HxDF (21-159)	HxCF (17-205)
LCS 320-251687/2-A	Lab Control Sample	83	83	84	72	67	75	68	78
LCS 320-251687/3-A	Lab Control Sample Dup	83	81	82	70	66	74	66	78

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCDD (21-227)	PeCDF (21-192)	13CHxCF (22-176)	PeCF (13-328)	TCDD (20-175)	TCDF (22-152)	OCDD (13-199)
LCS 320-251687/2-A	Lab Control Sample	77	77	70	77	76	77	93
LCS 320-251687/3-A	Lab Control Sample Dup	77	73	70	73	74	74	90

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

TestAmerica Seattle

Isotope Dilution Summary

Client: AECOM

Project/Site: Portland Harbor Pre-Remedial Design

TestAmerica Job ID: 580-78854-8

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

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