TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-79670-1
Client Project/Site: Portland Harbor Pre-Remedial Design
Revision: 1

For:
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Authorized for release by:
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Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-79670-1

REVISION 1: NOVEMBER 7, 2018
This revision was required to add missing method blank and LCS results for Acenaphthylene for the 8270D SIM PAH analysis.

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
One sample was received on 8/17/2018 3:30 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

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

This report contains results of all analyses performed by TestAmerica Seattle.

The sample was frozen to preserve the holding times. The samples were placed in the freezer in Seattle on 8/28/18.

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.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)
Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for semivolatile organic compounds (GC-MS) in accordance with 8270D. The sample was prepared on 09/08/2018 and analyzed on 10/08/2018.

Bis(2-ethylhexyl) phthalate was detected in method blank MB 580-283557/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. This target analyte concentration was less than half the reporting limit (1/2RL); therefore, re-extraction and re-analysis of samples were not performed.

The CCVIS failed 11% above %D limits for surrogate Terphenyl-d14 (Surr). Since the affected sample is both well within acceptance criteria (both are above 80%R with a lower recovery limit of 58%), the data is qualified and reported. PDI-SG-B307-BL1 (580-79670-1).

Sample PDI-SG-B307-BL1 (580-79670-1) was frozen to preserve holding time. The sample was thawed on 9/7/18 for extraction on 9/8/18.

The following sample was diluted due to the nature of the sample matrix: PDI-SG-B307-BL1 (580-79670-1). Elevated reporting limits

Job ID: 580-79670-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

(RLs) are provided.

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

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with SW846 8270D_SIM. The sample was prepared on 10/03/2018 and analyzed on 10/04/2018 and 10/06/2018.

The following samples and batch QC were re-analyzed due to a failing CCVIS for the reported analytes. PDI-SG-B307-BL1 (580-79670-1), (LCS 580-285535/2-A), and (MB 580-285535/1-A).

The %D of surrogate in CCV associated with batch 580-285645 were outside the lower control limits. All associated sample surrogate fell within acceptance criteria; therefore, the data have been reported. (CCVIS 580-285645/3).

Sample PDI-SG-B307-BL1 (580-79670-1) was frozen in hold. The sample was removed from freezer on 10/02/18.

The following sample was diluted due to the nature of the sample matrix: PDI-SG-B307-BL1 (580-79670-1). Elevated reporting limits (RLs) are provided.

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

ORGANOTINS BY GC/MS

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for organotins by GC/MS in accordance with the Krone Method. The sample was prepared on 09/19/2018 and 09/26/2018 and analyzed on 09/25/2018 and 10/9/2018.

Sample PDI-SG-B307-BL1 (580-79670-1) was frozen upon receipt. The sample was thawed on the evening of 09/18/2018 and needed re-prep so was removed from the freezer again on 9/25/18.

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

DIESEL AND EXTENDED RANGE ORGANICS

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for diesel and extended range organics in accordance with Method NWTPH-Dx. The sample was prepared on 09/19/2018 and analyzed on 09/22/2018.

The following sample contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: PDI-SG-B307-BL1 (580-79670-1.

Sample PDI-SG-B307-BL1 (580-79670-1) was frozen upon receipt. The sample was thawed on the evening of 09/18/2018.

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

METALS (ICPMS)

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for Metals (ICPMS) in accordance with 6020A_LL. The sample was prepared and analyzed on 09/06/2018.

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

TOTAL MERCURY

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for total mercury in accordance with EPA SW-846 Method 7471A. The sample was prepared and analyzed on 08/31/2018.

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

TOTAL ORGANIC CARBON

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for total organic carbon in accordance with EPA SW-846 Method 9060. The

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Laboratory: TestAmerica Seattle (Continued)

sample was analyzed on 08/30/2018.

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

GRAIN SIZE

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for grain size in accordance with ASTM D7928/D6913. The sample was analyzed on 09/04/2018.

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

PERCENT SOLIDS

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for percent solids in accordance with ASTM D2216. The sample was analyzed on 09/07/2018.

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

TOTAL SOLIDS @ 70C

Sample PDI-SG-B307-BL1 (580-79670-1) was analyzed for Total Solids @ 70C. The sample was analyzed on 09/04/2018.

No 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: 580-79670-1

Qualifiers

GC/MS Semi VOA

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.
B	Compound was found in the blank and sample.

GC Semi VOA

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.

Metals

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.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

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-B307-BL1

Date Collected: 08/16/18 16:06
Date Received: 08/17/18 15:30

Lab Sample ID: 580-79670-1

Matrix: Solid
Percent Solids: 61.6

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	15		15	1.4	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Acenaphthylene	5.2	J	15	1.5	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Anthracene	53		15	1.8	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Benzo[a]anthracene	83		15	2.3	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Benzo[a]pyrene	73		15	1.2	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Benzo[g,h,i]perylene	57		15	1.5	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Chrysene	93		15	4.6	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Dibenz(a,h)anthracene	13	J	15	2.2	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Indeno[1,2,3-cd]pyrene	53		15	1.8	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Naphthalene	14	J	15	2.4	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Phenanthrene	180		15	2.1	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10
Pyrene	200		15	2.9	ug/Kg	☼	10/03/18 09:05	10/04/18 19:10	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*69*		*57 - 120*	*10/03/18 09:05*	*10/04/18 19:10*	*10*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	21		15	1.8	ug/Kg	☼	10/03/18 09:05	10/06/18 16:00	10
Benzo[b]fluoranthene	85		15	1.8	ug/Kg	☼	10/03/18 09:05	10/06/18 16:00	10
Benzo[k]fluoranthene	25		15	1.8	ug/Kg	☼	10/03/18 09:05	10/06/18 16:00	10
Fluoranthene	130		15	4.3	ug/Kg	☼	10/03/18 09:05	10/06/18 16:00	10
Fluorene	20		15	1.5	ug/Kg	☼	10/03/18 09:05	10/06/18 16:00	10

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	57	J B	470	55	ug/Kg	☼	09/08/18 14:48	10/08/18 15:58	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*85*		*58 - 120*	*09/08/18 14:48*	*10/08/18 15:58*	*10*

Method: Organotins - Organotins, PSEP (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		120	30	ug/Kg	☼	09/26/18 09:35	10/09/18 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tripentyltin	*11*		*10 - 113*	*09/26/18 09:35*	*10/09/18 21:52*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	76	J	79	20	mg/Kg	☼	09/19/18 16:08	09/22/18 19:45	1
Motor Oil (>C24-C36)	530		79	28	mg/Kg	☼	09/19/18 16:08	09/22/18 19:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*96*		*50 - 150*	*09/19/18 16:08*	*09/22/18 19:45*	*1*

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.8		0.20	0.041	mg/Kg	☼	09/06/18 09:57	09/06/18 16:12	5
Cadmium	0.15	J	0.16	0.032	mg/Kg	☼	09/06/18 09:57	09/06/18 16:12	5
Copper	31		0.41	0.090	mg/Kg	☼	09/06/18 09:57	09/06/18 16:12	5

Client Sample ID: PDI-SG-B307-BL1
Date Collected: 08/16/18 16:06
Date Received: 08/17/18 15:30

Lab Sample ID: 580-79670-1
Matrix: Solid
Percent Solids: 61.6

Method: 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	15		0.20	0.020	mg/Kg	☼	09/06/18 09:57	09/06/18 16:12	5
Zinc	88		2.0	0.66	mg/Kg	☼	09/06/18 09:57	09/06/18 16:12	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.061		0.042	0.013	mg/Kg	☼	08/31/18 11:25	08/31/18 17:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	42000		2000	44	mg/Kg			08/30/18 18:45	1
Total Solids	61.6		0.1	0.1	%			09/07/18 16:11	1
Total Solids @ 70°C	59	H	0.10	0.10	%			09/04/18 13:37	1

Method: D7928/D6913 - ASTM D7928/D6913

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Clay	4.4				%			09/04/18 13:37	1
Coarse Sand	0.9				%			09/04/18 13:37	1
Fine Sand	53.4				%			09/04/18 13:37	1
Gravel	0.0				%			09/04/18 13:37	1
Medium Sand	11.3				%			09/04/18 13:37	1
Silt	30.0				%			09/04/18 13:37	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-283557/1-A
Matrix: Solid
Analysis Batch: 283620

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 283557

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	5.12	J	30	3.6	ug/Kg		09/08/18 14:48	09/10/18 15:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*90*		*58 - 120*	*09/08/18 14:48*	*09/10/18 15:32*	*1*

Lab Sample ID: LCS 580-283557/2-A
Matrix: Solid
Analysis Batch: 283620

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 283557

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bis(2-ethylhexyl) phthalate	50.0	42.3		ug/Kg		85	59 - 123

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*88*		*58 - 120*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-285535/1-A
Matrix: Solid
Analysis Batch: 285645

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 285535

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND		1.0	0.090	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Acenaphthylene	ND		1.0	0.10	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Anthracene	ND		1.0	0.12	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Benzo[a]anthracene	ND		1.0	0.15	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Benzo[a]pyrene	ND		1.0	0.080	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Benzo[g,h,i]perylene	ND		1.0	0.10	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Chrysene	ND		1.0	0.30	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Dibenz(a,h)anthracene	ND		1.0	0.14	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Indeno[1,2,3-cd]pyrene	ND		1.0	0.12	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Naphthalene	ND		1.0	0.16	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Phenanthrene	ND		1.0	0.14	ug/Kg		10/03/18 09:05	10/04/18 10:55	1
Pyrene	ND		1.0	0.19	ug/Kg		10/03/18 09:05	10/04/18 10:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*83*		*57 - 120*	*10/03/18 09:05*	*10/04/18 10:55*	*1*

Lab Sample ID: LCS 580-285535/2-A
Matrix: Solid
Analysis Batch: 285645

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 285535

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylnaphthalene	200	170		ug/Kg		85	68 - 120
Acenaphthylene	200	209		ug/Kg		104	68 - 120
Anthracene	200	196		ug/Kg		98	73 - 125
Benzo[a]anthracene	200	184		ug/Kg		92	66 - 120

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-285535/2-A
Matrix: Solid
Analysis Batch: 285645

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 285535

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzo[a]pyrene	200	181		ug/Kg		91	72 - 124
Benzo[g,h,i]perylene	200	195		ug/Kg		97	63 - 120
Chrysene	200	175		ug/Kg		88	69 - 120
Dibenz(a,h)anthracene	200	188		ug/Kg		94	70 - 125
Indeno[1,2,3-cd]pyrene	200	190		ug/Kg		95	65 - 121
Naphthalene	200	173		ug/Kg		86	70 - 120
Phenanthrene	200	189		ug/Kg		95	73 - 120
Pyrene	200	183		ug/Kg		92	70 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14	*70*		*57 - 120*

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - RA

Lab Sample ID: MB 580-285535/1-A
Matrix: Solid
Analysis Batch: 285848

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 285535

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene - RA	ND		1.0	0.12	ug/Kg		10/03/18 09:05	10/06/18 11:29	1
Benzo[b]fluoranthene - RA	ND		1.0	0.12	ug/Kg		10/03/18 09:05	10/06/18 11:29	1
Benzo[k]fluoranthene - RA	ND		1.0	0.12	ug/Kg		10/03/18 09:05	10/06/18 11:29	1
Fluoranthene - RA	ND		1.0	0.28	ug/Kg		10/03/18 09:05	10/06/18 11:29	1
Fluorene - RA	ND		1.0	0.10	ug/Kg		10/03/18 09:05	10/06/18 11:29	1
Phenanthrene - RA	ND		1.0	0.14	ug/Kg		10/03/18 09:05	10/06/18 11:29	1
Pyrene - RA	ND		1.0	0.19	ug/Kg		10/03/18 09:05	10/06/18 11:29	1

Lab Sample ID: LCS 580-285535/2-A
Matrix: Solid
Analysis Batch: 285848

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 285535

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene - RA	200	178		ug/Kg		89	68 - 120
Benzo[b]fluoranthene - RA	200	195		ug/Kg		97	63 - 121
Benzo[k]fluoranthene - RA	200	190		ug/Kg		95	63 - 123
Fluoranthene - RA	200	181		ug/Kg		91	74 - 125
Fluorene - RA	200	187		ug/Kg		93	73 - 120
Phenanthrene - RA	200	180		ug/Kg		90	73 - 120
Pyrene - RA	200	175		ug/Kg		87	70 - 120

Method: Organotins - Organotins, PSEP (GC/MS)

Lab Sample ID: MB 580-284918/1-A
Matrix: Solid
Analysis Batch: 285981

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 284918

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		75	20	ug/Kg		09/26/18 09:35	10/09/18 16:44	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	54		10 - 113	09/26/18 09:35	10/09/18 16:44	1

Lab Sample ID: LCS 580-284918/2-A
Matrix: Solid
Analysis Batch: 285981

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 284918

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Tributyltin	178	95.2		ug/Kg		53	14 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tripentyltin	52		10 - 113

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-284396/1-A
Matrix: Solid
Analysis Batch: 284670

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 284396

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		50	12	mg/Kg		09/19/18 16:08	09/22/18 14:52	1
Motor Oil (>C24-C36)	ND		50	18	mg/Kg		09/19/18 16:08	09/22/18 14:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	104		50 - 150	09/19/18 16:08	09/22/18 14:52	1

Lab Sample ID: LCS 580-284396/2-A
Matrix: Solid
Analysis Batch: 284670

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 284396

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
#2 Diesel (C10-C24)	500	471		mg/Kg		94	70 - 125
Motor Oil (>C24-C36)	500	484		mg/Kg		97	70 - 129

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	97		50 - 150

Lab Sample ID: LCSD 580-284396/3-A
Matrix: Solid
Analysis Batch: 284670

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 284396

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	500	476		mg/Kg		95	70 - 125	1	16
Motor Oil (>C24-C36)	500	495		mg/Kg		99	70 - 129	2	16

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	96		50 - 150

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-283345/22-A
Matrix: Solid
Analysis Batch: 283437

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 283345

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25	0.050	mg/Kg		09/06/18 09:57	09/06/18 13:47	5
Cadmium	ND		0.20	0.039	mg/Kg		09/06/18 09:57	09/06/18 13:47	5
Copper	ND		0.50	0.11	mg/Kg		09/06/18 09:57	09/06/18 13:47	5
Lead	ND		0.25	0.024	mg/Kg		09/06/18 09:57	09/06/18 13:47	5
Zinc	ND		2.5	0.81	mg/Kg		09/06/18 09:57	09/06/18 13:47	5

Lab Sample ID: LCS 580-283345/23-A
Matrix: Solid
Analysis Batch: 283437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 283345

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	200	196		mg/Kg		98	80 - 120
Cadmium	5.00	4.95		mg/Kg		99	80 - 120
Copper	25.0	25.1		mg/Kg		100	80 - 120
Lead	50.0	48.6		mg/Kg		97	80 - 120
Zinc	200	195		mg/Kg		98	80 - 120

Lab Sample ID: LCSD 580-283345/24-A
Matrix: Solid
Analysis Batch: 283437

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 283345

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	200	200		mg/Kg		100	80 - 120	2	20
Cadmium	5.00	4.95		mg/Kg		99	80 - 120	0	20
Copper	25.0	25.4		mg/Kg		102	80 - 120	1	20
Lead	50.0	48.8		mg/Kg		98	80 - 120	0	20
Zinc	200	197		mg/Kg		99	80 - 120	1	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-282985/22-A
Matrix: Solid
Analysis Batch: 283108

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 282985

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.0090	mg/Kg		08/31/18 11:25	08/31/18 17:04	1

Lab Sample ID: LCS 580-282985/23-A
Matrix: Solid
Analysis Batch: 283108

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 282985

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.167	0.187		mg/Kg		112	80 - 120

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 580-282985/24-A
Matrix: Solid
Analysis Batch: 283108

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 282985

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			0.167	0.170		mg/Kg		102	80 - 120	10	20

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-282945/5
Matrix: Solid
Analysis Batch: 282945

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	44	mg/Kg			08/30/18 17:08	1

Lab Sample ID: LCS 580-282945/6
Matrix: Solid
Analysis Batch: 282945

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon - Duplicates			4270	6190		mg/Kg		145	68 - 149

Lab Sample ID: LCSD 580-282945/7
Matrix: Solid
Analysis Batch: 282945

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates			4270	6210		mg/Kg		145	68 - 149	0	32

Lab Chronicle

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

TestAmerica Job ID: 580-79670-1

Client Sample ID: PDI-SG-B307-BL1

Lab Sample ID: 580-79670-1
Date Collected: 08/16/18 16:06
Matrix: Solid
Date Received: 08/17/18 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	282945	08/30/18 18:45	SPP	TAL SEA
Total/NA	Analysis	D 2216		1	283499	09/07/18 16:11	JCM	TAL SEA
Total/NA	Analysis	Moisture 70C		1	283856	09/04/18 13:37	HJM	TAL SEA
Total/NA	Analysis	D7928/D6913		1	283164	09/04/18 13:37	A1K	TAL SEA

Client Sample ID: PDI-SG-B307-BL1

Lab Sample ID: 580-79670-1
Date Collected: 08/16/18 16:06
Matrix: Solid
Date Received: 08/17/18 15:30
Percent Solids: 61.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3550B			283557	09/08/18 14:48	KMS	TAL SEA
Total/NA	Analysis	8270D		10	285903	10/08/18 15:58	W1T	TAL SEA
Total/NA	Prep	3546			285535	10/03/18 09:05	BAH	TAL SEA
Total/NA	Analysis	8270D SIM		10	285696	10/04/18 19:10	W1T	TAL SEA
Total/NA	Prep	3546	RA		285535	10/03/18 09:05	BAH	TAL SEA
Total/NA	Analysis	8270D SIM	RA	10	285848	10/06/18 16:00	ERZ	TAL SEA
Total/NA	Prep	Organotin Prep			284918	09/26/18 09:35	APR	TAL SEA
Total/NA	Analysis	Organotins		1	285981	10/09/18 21:52	ERZ	TAL SEA
Total/NA	Prep	3546			284396	09/19/18 16:08	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	284670	09/22/18 19:45	JCM	TAL SEA
Total/NA	Prep	3050B			283345	09/06/18 09:57	T1H	TAL SEA
Total/NA	Analysis	6020B		5	283437	09/06/18 16:12	FCW	TAL SEA
Total/NA	Prep	7471A			282985	08/31/18 11:25	T1H	TAL SEA
Total/NA	Analysis	7471A		1	283108	08/31/18 17:44	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
TestAmerica Job ID: 580-79670-1
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	11-05-19
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

Sample Summary

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

TestAmerica Job ID: 580-79670-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79670-1	PDI-SG-B307-BL1	Solid	08/16/18 16:06	08/17/18 15:30

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	**Project Contact: Amy Dahl / Chelsey Cook**
AECOM	**Tel: (206) 438-2261 / (206) 438-2010**
1111 3rd Ave Suite 1600	**Analysis Turnaround Time**
Seattle, WA 98101	Calendar (C) or Work Days (W) _____
Phone: (206) 438-2700 Fax: 1+(866) 495-5288	[x] 21 days
Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	[ ] Other _____
Portland, OR	
Project #: 60566335 Study: Surface Sediment	
Sample Type: SRS	

Site Contact: Jennifer Ray
Laboratory Contact: Elaine-Walker

Date:8/17/18
Carrier: Courier

COC No: 1
__1__ of __1__ COCs

580-79670 Chain of Custody

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	Sample Specific Notes:
PDI-SG-B307-BL1	8/16/18	16:06	SS		MM	7		x	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] Disposal By Lab [X] Archive For 12 Months

Special Instructions/QC Requirements & Comments:

Separate reports for each lab.

1.7

Relinquished by:	Company: AECOM	Date/Time: 1500 8/17/18	Received by:	Company: M.E.	Date/Time: 8/17/18 1500
Relinquished by:	Company: M.E.	Date/Time: 8/17/18 1530	Received by:	Company: 8/17/18 1530	Date/Time: TAPOR
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**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010**	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**Date:8/17/18** **Carrier: Courier**	COC No: 1 1 of 1 COCs

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: **SRS**	Calendar (C) or Work Days (W) _____ [x] 21 days [ ] Other _____

580-79670 Chain of Custody

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	Sample Specific Notes:
PDI-SG-B307-BL1	8/16/18	16:06	SS		MM	7 0		x	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] Disposal By Lab [X] Archive For **12** Months

Special Instructions/QC Requirements & Comments:

Separate reports for each lab.

1.7

Relinquished by:	Company: AECOM	Date/Time: 1500 8/17/18	Received by:	Company: M.E	Date/Time: 8/17/18 1500
Relinquished by:	Company: M.E.	Date/Time: 8/17/18 1530	Received by:	Company: 8/17/18 1530	Date/Time: TAPOL
Relinquished by:	Company: TAPOL	Date/Time: 8/17/18 1800	Received by: B. Zuer	Company: SCH TD	Date/Time: 8.18.18 0950

E125 = 1.6/1.6 w/C.S.

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-79670-1

Login Number: 79670
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	