TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 580-78604-1
Client Project/Site: Portland Harbor Pre-Remedial Design

For:
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Attn: Amy Dahl

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Authorized for release by:
7/31/2018 6:16:28 PM

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Job ID: 580-78604-1

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Portland Harbor Pre-Remedial Design
Report Number: 580-78604-1

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 7/5/2018 3:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.3º C, 0.7º C and 2.2º C.

The following sample was activated for Manganese by 6020BLL analysis by the client on 7/10/2018: PDI-SG-B466 (580-78604-8). This analysis was not originally requested on the chain-of-custody (COC).

The following samples were activated by the client for TOC, Metals + Mn and Solids on 7/19/2018: PDI-SG-B458 (580-78604-1), PDI-SG-B470 (580-78604-2), PDI-SG-B469 (580-78604-3), PDI-SG-B456 (580-78604-4), PDI-SG-B462 (580-78604-5), PDI-SG-B463 (580-78604-6), PDI-SG-B463 (580-78604-6[MS]), PDI-SG-B463 (580-78604-6[MSD]), PDI-SG-B464 (580-78604-7), PDI-SG-B466 (580-78604-8), PDI-SG-B468 (580-78604-9), PDI-SG-B429 (580-78604-10) and PDI-RB-VV-180703 (580-78604-11). These analyses were previously on hold.

The Client changed the sample ID for the RB from RB-VV-180703-1720 should be PDI-RB-VV-180703

This report contains results of the rinse blank sample only. All other analyses are currently on hold.

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-RB-VV-180703 (580-78604-11) was analyzed for semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8270D. The sample was prepared on 07/08/2018 and analyzed on 07/12/2018.

Bis(2-ethylhexyl) phthalate failed the recovery criteria high for LCS 580-278382/2-A. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

The continuing calibration verification (CCV) associated with batch 580-278847 recovered above the upper control limit for Bis(2-ethylhexyl) phthalate. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: PDI-RB-VV-180703 (580-78604-11) and (CCVIS 580-278847/3).

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

Job ID: 580-78604-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Sample PDI-RB-VV-180703 (580-78604-11) was analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270D SIM. The sample was prepared on 07/08/2018 and analyzed on 07/12/2018.

The following sample ran outside the 12 hour tune window established by the injection of DFTPP. The clock exceedance was 24 minutes, but a closing CCV was evaluated after the sample injection which passed 20%D recovery criteria for all reporting targets and surrogates. Because the instrument run was verified to still be in tune by the passing CCVC, data is qualified and reported as secondary data. PDI-RB-VV-180703 (580-78604-11) and (CCVC 580-278760/29).

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-RB-VV-180703 (580-78604-11) was analyzed for organotins by GC/MS in accordance with the Krone Method. The sample was prepared on 07/08/2018 and analyzed on 07/12/2018.

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

DIESEL AND MOTOR OIL RANGE ORGANICS

Sample PDI-RB-VV-180703 (580-78604-11) was analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The sample was prepared on 07/16/2018 and analyzed on 07/18/2018.

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

METALS (ICPMS)

Sample PDI-RB-VV-180703 (580-78604-11) was analyzed for Metals (ICPMS) in accordance with 6020A_LL. The sample was prepared on 07/09/2018 and analyzed on 07/10/2018.

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

TOTAL MERCURY

Sample PDI-RB-VV-180703 (580-78604-11) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared and analyzed on 07/09/2018.

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

TOTAL ORGANIC CARBON

Sample PDI-RB-VV-180703 (580-78604-11) was analyzed for total organic carbon in accordance with SM 5310B. The sample was analyzed on 07/11/2018.

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

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.

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
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Client Sample ID: PDI-RB-VV-180703

Date Collected: 07/03/18 17:20
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-11

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.096	0.017	ug/L		07/08/18 13:07	07/12/18 03:04	1
2-Methylnaphthalene	ND		0.096	0.019	ug/L		07/08/18 13:07	07/12/18 03:04	1
Acenaphthylene	ND		0.19	0.042	ug/L		07/08/18 13:07	07/12/18 03:04	1
Acenaphthene	ND		0.096	0.0058	ug/L		07/08/18 13:07	07/12/18 03:04	1
Fluorene	ND		0.096	0.012	ug/L		07/08/18 13:07	07/12/18 03:04	1
Phenanthrene	ND		0.096	0.018	ug/L		07/08/18 13:07	07/12/18 03:04	1
Anthracene	ND		0.096	0.0067	ug/L		07/08/18 13:07	07/12/18 03:04	1
Fluoranthene	ND		0.096	0.012	ug/L		07/08/18 13:07	07/12/18 03:04	1
Pyrene	ND		0.096	0.0086	ug/L		07/08/18 13:07	07/12/18 03:04	1
Benzo[a]anthracene	ND		0.096	0.0058	ug/L		07/08/18 13:07	07/12/18 03:04	1
Chrysene	ND		0.096	0.0058	ug/L		07/08/18 13:07	07/12/18 03:04	1
Benzo[b]fluoranthene	ND		0.096	0.0058	ug/L		07/08/18 13:07	07/12/18 03:04	1
Benzo[k]fluoranthene	ND		0.096	0.012	ug/L		07/08/18 13:07	07/12/18 03:04	1
Benzo[a]pyrene	ND		0.096	0.034	ug/L		07/08/18 13:07	07/12/18 03:04	1
Indeno[1,2,3-cd]pyrene	ND		0.096	0.0058	ug/L		07/08/18 13:07	07/12/18 03:04	1
Dibenz(a,h)anthracene	ND		0.096	0.0058	ug/L		07/08/18 13:07	07/12/18 03:04	1
Benzo[g,h,i]perylene	ND		0.19	0.073	ug/L		07/08/18 13:07	07/12/18 03:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*95*		*54 - 120*	*07/08/18 13:07*	*07/12/18 03:04*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND	*	14	6.0	ug/L		07/08/18 13:07	07/12/18 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*96*		*55 - 126*	*07/08/18 13:07*	*07/12/18 17:49*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		0.35	0.053	ug/L		07/08/18 15:32	07/12/18 23:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tripentyltin	*128*		*10 - 142*	*07/08/18 15:32*	*07/12/18 23:22*	*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)	ND		0.11	0.066	mg/L		07/16/18 13:31	07/18/18 19:53	1
Motor Oil (>C24-C36)	ND		0.36	0.098	mg/L		07/16/18 13:31	07/18/18 19:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*07/16/18 13:31*	*07/18/18 19:53*	*1*

Method: 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00021**	**J**	0.0010	0.00020	mg/L		07/09/18 14:21	07/10/18 14:52	1
Cadmium	ND		0.00040	0.00010	mg/L		07/09/18 14:21	07/10/18 14:52	1
Copper	ND		0.0020	0.00060	mg/L		07/09/18 14:21	07/10/18 14:52	1
Lead	ND		0.00080	0.00020	mg/L		07/09/18 14:21	07/10/18 14:52	1
Zinc	ND		0.0070	0.0019	mg/L		07/09/18 14:21	07/10/18 14:52	1
Manganese	**0.0011**	**J**	0.0020	0.00046	mg/L		07/09/18 14:21	07/10/18 14:52	1

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

TestAmerica Job ID: 580-78604-1

Client Sample ID: PDI-RB-VV-180703
Date Collected: 07/03/18 17:20
Date Received: 07/05/18 14:59

Lab Sample ID: 580-78604-11
Matrix: Water

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		07/09/18 11:46	07/09/18 16:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.37	J	1.0	0.19	mg/L			07/11/18 19:13	1

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

Lab Sample ID: MB 580-278382/1-A
Matrix: Water
Analysis Batch: 278847

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278382

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND		15	6.3	ug/L		07/08/18 13:07	07/12/18 16:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14 (Surr)	*101*		*55 - 126*	*07/08/18 13:07*	*07/12/18 16:34*	*1*

Lab Sample ID: LCS 580-278382/2-A
Matrix: Water
Analysis Batch: 278847

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 278382

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Bis(2-ethylhexyl) phthalate			2.00	ND	*	ug/L		163	20 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*97*		*55 - 126*

Lab Sample ID: LCSD 580-278382/3-A
Matrix: Water
Analysis Batch: 278847

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 278382

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Bis(2-ethylhexyl) phthalate			2.00	ND		ug/L		149	20 - 150	9	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14 (Surr)	*100*		*55 - 126*

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

Lab Sample ID: MB 580-278382/1-A
Matrix: Water
Analysis Batch: 278760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278382

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.10	0.018	ug/L		07/08/18 13:07	07/12/18 01:50	1
2-Methylnaphthalene	ND		0.10	0.020	ug/L		07/08/18 13:07	07/12/18 01:50	1
Acenaphthylene	ND		0.20	0.044	ug/L		07/08/18 13:07	07/12/18 01:50	1
Acenaphthene	ND		0.10	0.0060	ug/L		07/08/18 13:07	07/12/18 01:50	1
Fluorene	ND		0.10	0.013	ug/L		07/08/18 13:07	07/12/18 01:50	1
Phenanthrene	ND		0.10	0.019	ug/L		07/08/18 13:07	07/12/18 01:50	1
Anthracene	ND		0.10	0.0070	ug/L		07/08/18 13:07	07/12/18 01:50	1
Fluoranthene	ND		0.10	0.013	ug/L		07/08/18 13:07	07/12/18 01:50	1
Pyrene	ND		0.10	0.0090	ug/L		07/08/18 13:07	07/12/18 01:50	1
Benzo[a]anthracene	ND		0.10	0.0060	ug/L		07/08/18 13:07	07/12/18 01:50	1
Chrysene	ND		0.10	0.0060	ug/L		07/08/18 13:07	07/12/18 01:50	1
Benzo[b]fluoranthene	ND		0.10	0.0060	ug/L		07/08/18 13:07	07/12/18 01:50	1
Benzo[k]fluoranthene	ND		0.10	0.013	ug/L		07/08/18 13:07	07/12/18 01:50	1
Benzo[a]pyrene	ND		0.10	0.035	ug/L		07/08/18 13:07	07/12/18 01:50	1
Indeno[1,2,3-cd]pyrene	ND		0.10	0.0060	ug/L		07/08/18 13:07	07/12/18 01:50	1

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

Lab Sample ID: MB 580-278382/1-A
Matrix: Water
Analysis Batch: 278760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278382

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		0.10	0.0060	ug/L		07/08/18 13:07	07/12/18 01:50	1
Benzo[g,h,i]perylene	ND		0.20	0.076	ug/L		07/08/18 13:07	07/12/18 01:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Terphenyl-d14	*97*		*54 - 120*	*07/08/18 13:07*	*07/12/18 01:50*	*1*

Lab Sample ID: LCS 580-278382/2-A
Matrix: Water
Analysis Batch: 278760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 278382

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	2.00	1.63		ug/L		81	58 - 120
2-Methylnaphthalene	2.00	1.54		ug/L		77	53 - 120
Acenaphthylene	2.00	1.75		ug/L		88	33 - 130
Acenaphthene	2.00	1.63		ug/L		81	64 - 120
Fluorene	2.00	1.80		ug/L		90	67 - 120
Phenanthrene	2.00	1.71		ug/L		86	69 - 120
Anthracene	2.00	1.81		ug/L		91	46 - 127
Fluoranthene	2.00	2.09		ug/L		105	72 - 120
Pyrene	2.00	2.06		ug/L		103	57 - 133
Benzo[a]anthracene	2.00	2.14		ug/L		107	70 - 120
Chrysene	2.00	1.93		ug/L		97	65 - 120
Benzo[b]fluoranthene	2.00	2.18		ug/L		109	57 - 132
Benzo[k]fluoranthene	2.00	1.80		ug/L		90	61 - 132
Benzo[a]pyrene	2.00	1.80		ug/L		90	23 - 141
Indeno[1,2,3-cd]pyrene	2.00	2.09		ug/L		104	53 - 133
Dibenz(a,h)anthracene	2.00	2.06		ug/L		103	57 - 132
Benzo[g,h,i]perylene	2.00	1.97		ug/L		98	52 - 129

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Terphenyl-d14	*98*		*54 - 120*

Lab Sample ID: LCSD 580-278382/3-A
Matrix: Water
Analysis Batch: 278760

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 278382

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Naphthalene	2.00	1.65		ug/L		82	58 - 120	1	23
2-Methylnaphthalene	2.00	1.55		ug/L		78	53 - 120	1	23
Acenaphthylene	2.00	1.77		ug/L		88	33 - 130	1	34
Acenaphthene	2.00	1.64		ug/L		82	64 - 120	0	20
Fluorene	2.00	1.77		ug/L		89	67 - 120	1	20
Phenanthrene	2.00	1.78		ug/L		89	69 - 120	4	21
Anthracene	2.00	1.83		ug/L		92	46 - 127	1	19
Fluoranthene	2.00	2.14		ug/L		107	72 - 120	2	21
Pyrene	2.00	2.10		ug/L		105	57 - 133	2	21
Benzo[a]anthracene	2.00	2.18		ug/L		109	70 - 120	2	17
Chrysene	2.00	1.97		ug/L		99	65 - 120	2	19

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

Lab Sample ID: LCSD 580-278382/3-A
Matrix: Water
Analysis Batch: 278760

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 278382

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[b]fluoranthene			2.00	2.22		ug/L		111	57 - 132	2	25
Benzo[k]fluoranthene			2.00	1.90		ug/L		95	61 - 132	5	22
Benzo[a]pyrene			2.00	1.83		ug/L		91	23 - 141	1	35
Indeno[1,2,3-cd]pyrene			2.00	2.14		ug/L		107	53 - 133	2	25
Dibenz(a,h)anthracene			2.00	2.10		ug/L		105	57 - 132	2	24
Benzo[g,h,i]perylene			2.00	2.03		ug/L		101	52 - 129	3	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Terphenyl-d14	*96*		*54 - 120*

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

Lab Sample ID: MB 580-278385/1-A
Matrix: Water
Analysis Batch: 278838

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278385

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		0.30	0.046	ug/L		07/08/18 15:32	07/12/18 13:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tripentyltin	*121*		*10 - 142*	*07/08/18 15:32*	*07/12/18 13:18*	*1*

Lab Sample ID: LCS 580-278385/2-A
Matrix: Water
Analysis Batch: 278838

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 278385

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Tributyltin			0.898	0.978		ug/L		109	11 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tripentyltin	*103*		*10 - 142*

Lab Sample ID: LCSD 580-278385/3-A
Matrix: Water
Analysis Batch: 278838

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 278385

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Tributyltin			0.898	0.948		ug/L		106	11 - 150	3	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tripentyltin	*103*		*10 - 142*

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

Lab Sample ID: MB 580-279132/1-A
Matrix: Water
Analysis Batch: 279315

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 279132

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11	0.065	mg/L		07/16/18 13:31	07/18/18 14:31	1
Motor Oil (>C24-C36)	ND		0.35	0.096	mg/L		07/16/18 13:31	07/18/18 14:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*109*		*50 - 150*	*07/16/18 13:31*	*07/18/18 14:31*	*1*

Lab Sample ID: LCS 580-279132/2-A
Matrix: Water
Analysis Batch: 279315

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 279132

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			2.00	1.79		mg/L		89	50 - 120		
Motor Oil (>C24-C36)			2.00	1.91		mg/L		96	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*94*		*50 - 150*

Lab Sample ID: LCSD 580-279132/3-A
Matrix: Water
Analysis Batch: 279315

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 279132

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			2.00	1.95		mg/L		97	50 - 120	9	26
Motor Oil (>C24-C36)			2.00	2.10		mg/L		105	64 - 120	10	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*103*		*50 - 150*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-278448/14-A
Matrix: Water
Analysis Batch: 278636

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 278448

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00020	mg/L		07/09/18 14:21	07/10/18 13:41	1
Cadmium	ND		0.00040	0.00010	mg/L		07/09/18 14:21	07/10/18 13:41	1
Copper	ND		0.0020	0.00060	mg/L		07/09/18 14:21	07/10/18 13:41	1
Lead	ND		0.00080	0.00020	mg/L		07/09/18 14:21	07/10/18 13:41	1
Zinc	ND		0.0070	0.0019	mg/L		07/09/18 14:21	07/10/18 13:41	1
Manganese	ND		0.0020	0.00046	mg/L		07/09/18 14:21	07/10/18 13:41	1

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

Lab Sample ID: LCS 580-278448/15-A
Matrix: Water
Analysis Batch: 278636

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 278448

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.00		mg/L		100	80 - 120
Cadmium	0.100	0.0928		mg/L		93	80 - 120
Copper	0.500	0.510		mg/L		102	80 - 120
Lead	1.00	0.994		mg/L		99	80 - 120
Zinc	4.00	3.85		mg/L		96	80 - 120
Manganese	1.00	0.968		mg/L		97	80 - 120

Lab Sample ID: LCSD 580-278448/16-A
Matrix: Water
Analysis Batch: 278636

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 278448

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.00	3.99		mg/L		100	80 - 120	0	20
Cadmium	0.100	0.103		mg/L		103	80 - 120	11	20
Copper	0.500	0.514		mg/L		103	80 - 120	1	20
Lead	1.00	0.992		mg/L		99	80 - 120	0	20
Zinc	4.00	3.94		mg/L		99	80 - 120	2	20
Manganese	1.00	0.995		mg/L		99	80 - 120	3	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-278419/6-A
Matrix: Water
Analysis Batch: 278507

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278419

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00030	0.00015	mg/L		07/09/18 11:46	07/09/18 16:33	1

Lab Sample ID: LCS 580-278419/7-A
Matrix: Water
Analysis Batch: 278507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 278419

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00178		mg/L		89	80 - 120

Lab Sample ID: LCSD 580-278419/8-A
Matrix: Water
Analysis Batch: 278507

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 278419

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.00200	0.00176		mg/L		88	80 - 120	1	20

Lab Sample ID: 580-78604-11 MS
Matrix: Water
Analysis Batch: 278507

Client Sample ID: PDI-RB-VV-180703
Prep Type: Total/NA
Prep Batch: 278419

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		0.00200	0.00187		mg/L		93	80 - 120

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 580-78604-11 MSD
Matrix: Water
Analysis Batch: 278507

Client Sample ID: PDI-RB-VV-180703
Prep Type: Total/NA
Prep Batch: 278419

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.00200	0.00179		mg/L		90	80 - 120	4	20

Lab Sample ID: 580-78604-11 DU
Matrix: Water
Analysis Batch: 278507

Client Sample ID: PDI-RB-VV-180703
Prep Type: Total/NA
Prep Batch: 278419

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	ND		ND		mg/L		NC	20

Method: SM 5310B - Organic Carbon, Total (TOC)

Lab Sample ID: MB 580-278801/3
Matrix: Water
Analysis Batch: 278801

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	ND		1.0	0.19	mg/L			07/11/18 19:13	1

Lab Sample ID: LCS 580-278801/4
Matrix: Water
Analysis Batch: 278801

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	10.0	9.47		mg/L		95	85 - 115

Lab Chronicle

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

TestAmerica Job ID: 580-78604-1

Client Sample ID: PDI-RB-VV-180703

Lab Sample ID: 580-78604-11

Date Collected: 07/03/18 17:20

Matrix: Water

Date Received: 07/05/18 14:59

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			278382	07/08/18 13:07	JSM	TAL SEA
Total/NA	Analysis	8270D		1	278847	07/12/18 17:49	T1W	TAL SEA
Total/NA	Prep	3520C			278382	07/08/18 13:07	JSM	TAL SEA
Total/NA	Analysis	8270D SIM		1	278760	07/12/18 03:04	ERB	TAL SEA
Total/NA	Prep	Organotin			278385	07/08/18 15:32	JSM	TAL SEA
Total/NA	Analysis	Organotins		1	278838	07/12/18 23:22	TL1	TAL SEA
Total/NA	Prep	3510C			279132	07/16/18 13:31	JCM	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	279315	07/18/18 19:53	W1T	TAL SEA
Total Recoverable	Prep	3005A			278448	07/09/18 14:21	CJB	TAL SEA
Total Recoverable	Analysis	6020B		1	278636	07/10/18 14:52	FCW	TAL SEA
Total/NA	Prep	7470A			278419	07/09/18 11:46	CJB	TAL SEA
Total/NA	Analysis	7470A		1	278507	07/09/18 16:40	FCW	TAL SEA
Total/NA	Analysis	SM 5310B		1	278801	07/11/18 19:13	ASJ	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: 580-78604-1
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
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

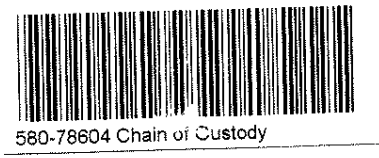
Sample Summary

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

TestAmerica Job ID: 580-78604-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78604-11	PDI-RB-VV-180703	Water	07/03/18 17:20	07/05/18 14:59

580-78604



SURFACE SEDIMENT
CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 **Ph: 253-922-2310 Fax: 253-922-5047**	**Project Contact: Amy Dahl / Chelsey Cook** **Tel: (206) 438-2261 / (206) 438-2010** **Analysis Turnaround Time** Calendar (C) or Work Days (W)	**Site Contact: Jennifer Ray** **Laboratory Contact: Elaine-Walker**	**7/5/2018** **Carrier: Courier**	COC No: 1 1 of 1 pages
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**	☐ 21 days ☒ Other _ASAP_(sediments only)_____			

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, Krone/Unger	Atterberg Limits ASTM D4318	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	WQ - Total Organic Carbon SM5310B	WQ - PAHs 8270-SIM	WQ - BEHP EPA 8270D-LL	WQ - Tributyltin Krone/Unger	Sample Specific Notes:
PDI-SG-B458	7/2/2018	11:00	SS		AC	7		H	H	H	x	H	H	H									
PDI-SG-B470	7/2/2018	15:20	SS		AC	B		H	H	H	x	H	H	H	H								
PDI-SG-B469	7/2/2018	16:30	SS		AC	B		H	H	H	x	H	H	H	H								
PDI-SG-B456	7/2/2018	10:19	SS		SH	7		H	H	H	x	H	H	H									
PDI-SG-B462	7/2/2018	11:56	SS		SH	B		H	H	H	x	H	H	H	H								
PDI-SG-B463	7/2/2018	12:58	SS	MS/MSD	SH	14		H	H	H	x	H	H	H	H								
PDI-SG-B464	7/2/2018	14:39	SS		SH	8		H	H	H	x	H	H	H	H								
PDI-SG-B466	7/2/2018	15:34	SS		SH	8		H	H	x*	x*	x*	H	H	H								
PDI-SG-B468	7/2/2018	14:02 16:35	SS		SH	8		H	H	H	x	H	H	H	H								
PDI-SG-B429	7/3/2018	10:15	SS		SH	7		H	H	H	x	H	H	H									
RB-VV-180703-1720	7/3/2018	17:20	W		SH	14										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 ☒ 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), and TOC (9060 @ 104C & 70C) ASAP. Rush TAT for these take precedent over remaining rush grain size analyses requested ASAP.

H - Hold analyses pending further instruction.

0.7, 20, 0.3

Relinquished by:	Company: AECOM	Date/Time: 7/5/18 1234	Received by:	Company: M.E.	Date/Time: 7/5/18 1235
Relinquished by:	Company: M.E.	Date/Time: 7/5/18 1500	Received by:	Company: TAPOR	Date/Time: 7/5/18 1500
Relinquished by:	Company: TAPOR	Date/Time: 7/5/18 1700	Received by:	Company: SFA TA	Date/Time: 7/6/18 0930

= 0.8 / 0.8 w/cs

IRS = 0.7 / 0.7 w/cs.

= -1.9 / -1.9 w/cs

Revised COC

580-78604

580-78604 Chain of Custody

SURFACE SEDIMENT CHAIN OF CUSTODY

TestAmerica-Seattle 5755-8th-Street-East Tacoma, WA 98424-1317 Ph: 253-922-2310 Fax: 253-922-5047	Project Contact: Amy Dahl / Chelsey Cook Tel: (206) 438-2261 / (206) 438-2010 Analysis Turnaround Time Calendar (C) or Work Days (W) ☐ 21 days ☒ Other _ASAP_(sediments only)_____	Site Contact: Jennifer Ray Laboratory Contact: Elaine-Walker Carrier: Courier 7/5/2018 COC No: 1 1 of 1 pages

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: DAU

Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Total No. of Cont.	PCB Congeners 1668A	PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	Grain size ASTM D7928/D4913	Total organic carbon, Total solids 9060 (104C & 70C)	Archive Archive -30 C	PAHs, BEHP, Tributyltin, 8270-SIM, 8270-LL, Kreosl/Unger	Atterberg Limits ASTM D4318	WQ - PCB Congeners 1668A	WQ - PCDD/Fs 1613B	TPH Diesel, Metals, Mercury NWTPH-Dx, 6020B, 7471A	WQ - Total Organic Carbon SM5310B	WQ - PAHs 8270-SIM	WQ - BEHP EPA 8270D-LL	WQ - Tributyltin Kreosl/Unger	Sample Specific Notes:
PDI-SG-B458	7/2/2018	11:00	SS		AC	7	H	H	H	x	H	H	H									
PDI-SG-B470	7/2/2018	15:20	SS		AC	B	H	H	H	x	H	H	H	H								
PDI-SG-B469	7/2/2018	16:30	SS		AC	B	H	H	H	x	H	H	H	H								
PDI-SG-B456	7/2/2018	10:19	SS		SH	7	H	H	H	x	H	H	H									
PDI-SG-B462	7/2/2018	11:56	SS		SH	B	H	H	H	x	H	H	H	H								
PDI-SG-B463	7/2/2018	12:58	SS	MS/MSD	SH	14	H	H	H	x	H	H	H	H								
PDI-SG-B464	7/2/2018	14:39	SS		SH	8	H	H	H	x	H	H	H	H								
PDI-SG-B466	7/2/2018	15:34	SS		SH	8	H	H	x*	x*	x*	H	H	H								
PDI-SG-B468	7/2/2018	14:02/16:33	SS		SH	8	H	H	H	x	H	H	H	H								
PDI-SG-B429	7/3/2018	10:15	SS		SH	7	H	H	HX	x	X	X	H									
PDI-RB-VV-180703-1720 (KP 7/22/18 Per Amec)	7/3/2018	17:20	W		SH	14									x	x	x	x	x	x	x	***Added analysis 7/19 (KP) Per Amec

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)

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Special Instructions/QC Requirements & Comments:

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x*- Analyze for grain size, metals (6020B analytes only), and TOC (9060 @ 104C & 70C) ASAP. Rush TAT for these take precedent over remaining rush grain size analyses requested ASAP.

H - Hold analyses pending further instruction.

0.7, 2.2, 0.3

Relinquished by:	Company: AECOM	Date/Time: 7/5/18 1234	Received by:	Company: M.E.	Date/Time: 7/5/18 1235
Relinquished by:	Company: M.E.	Date/Time: 7/5/18 1500	Received by:	Company: TAPOR	Date/Time: 7/5/18 1500
Relinquished by:	Company: TAPOR	Date/Time: 7/5/18 1700	Received by: B.	Company: SFR TA	Date/Time: 7/6/18 0930

*** Metals, TOC, Solids activated
In On Hold Samples Per Amec
7/19/18 (KP)

*** Revised ~~Corrected~~ Changed Sample Rpt. Add PDI-RB-VV-180703-1720 (KP) Per Amec 7/22/18

= 0.8/0.8 w/cs

IRS = 0.7/0.7 w/cs.

= -1.9/-1.9 w/cs

7/31/2018

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78604-1

Login Number: 78604
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	

Presley, Kim

From: Dahl, Amy <amy.dahl@aecom.com>
Sent: Sunday, July 22, 2018 3:25 PM
To: Presley, Kim
Cc: Walker, M Elaine; Cook, Chelsey; Ray, Jennifer
Subject: changes for rinsate blanks
Attachments: SampleLoginAck_580-78853-1 [Std_Tal_Login_Ack].pdf; COC 580-78853 (201807171049).pdf

-External Email-

Hi Kim, we need to change the sample IDs and add manganese to the metals list to match those special rush sediment samples for the following rinsate blanks:

580-78527-26 (PDI-SG-RB-20180630 should be PDI-RB-VV-180630)
580-78604-11 (RB-VV-180703-1720 should be PDI-RB-VV-180703)
580-78853-1 (PDI-RB-VV-20180713 should be PDI-RB-VV-180713

Jennifer, can you make sure the field team is using the proper nomenclature for rinsate blanks:

PDI-RB-VV-YYMMDD (only include time if more than one blank is collected in a day)

Thank you,

PRIVILEGED AND CONFIDENTIAL / JOINT DEFENSE COMMUNICATION / ATTORNEY CLIENT WORK PRODUCT

Amy Dahl, PhD
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1111 Third Avenue, Suite 1600
Seattle, WA 98101, United States
T +1-206-438-2700
aecom.com

From: Presley, Kim [mailto:kim.presley@testamericainc.com]
Sent: Friday, July 20, 2018 9:25 AM
To: Dahl, Amy; Cook, Chelsey
Subject: TestAmerica Seattle sample confirmation files from 580-78853-1 Portland Harbor Pre-Remedial Design

Hello,

Attached please find the Seattle sample confirmation files for job 580-78853-1; Portland Harbor Pre-Remedial Design

Please feel free to contact me or your PM Elaine Walker if you have any questions.

Thank you.

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: Project Feedback

KIM A PRESLEY
Project Manager Assistant

TestAmerica Seattle
THE LEADER IN ENVIRONMENTAL TESTING

Tel: 253.922.2310
www.testamericainc.com

Reference: [251596]
Attachments: 2