

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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TestAmerica Job ID: 580-80213-6 Client Project/Site: Portland Harbor Pre-Remedial Design

For:

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

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Job ID: 580-80213-6

Laboratory: TestAmerica Seattle

Narrative

CASE NARRATIVE Client: AECOM Project: Portland Harbor Pre-Remedial Design Report Number: 580-80213-6

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

Three samples were received on 9/10/2018 12:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3° C.

This report contains results of the Rinse Blank sample only, for analyses performed by TestAmerica Seattle.

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-090718 (580-80213-3) was analyzed for semivolatile organic compounds (GC-MS) in accordance with EPA SW-846 Method 8270D. The sample was prepared on 09/12/2018 and analyzed on 09/14/2018.

Bis(2-ethylhexyl) phthalate exceeded the RPD limit for LCSD 580-283783/3-A. The LCS and LCSD recoveries and precision met acceptance limits.

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-RB-VV-090718 (580-80213-3) was analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270D SIM. The sample was prepared on 09/12/2018 and analyzed on 09/14/2018.

The continuing calibration verification (CCV) associated with batch 580-284016 recovered above the upper control limit for Benzo[k]fluoranthene. 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-090718 (580-80213-3) and (CCVIS 580-284016/3).

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-090718 (580-80213-3) was analyzed for organotins by GC/MS in accordance with the Krone Method. The sample was prepared on 09/13/2018 and analyzed on 09/22/2018.

1 2 3 4 5 6 7 8 9 10

Job ID: 580-80213-6 (Continued)

Laboratory: TestAmerica Seattle (Continued)

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-090718 (580-80213-3) was analyzed for diesel and motor oil range organics in accordance with Method NWTPH-Dx. The sample was prepared on 09/18/2018 and analyzed on 09/19/2018.

Continuing calibration verification (CCV) standard associated with batch 580-284335 recovered outside %Drift acceptance criteria for o-Terphenyl surrogate. The %Recovery is within acceptance criteria for the surrogate in the CCV and associated samples; therefore, the data are qualified and reported. The following samples are impacted: PDI-RB-VV-090718 (580-80213-3), (CCV 580-284335/14), (CCV 580-284335/25), (CCVRT 580-284335/3), (LCS 580-284200/2-A), (LCSD 580-284200/3-A), and (MB 580-284200/1-A).

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

METALS (ICPMS)

Sample PDI-RB-VV-090718 (580-80213-3) was analyzed for Metals (ICPMS) in accordance with 6020A_LL. The sample was prepared on 09/24/2018 and analyzed on 09/25/2018.

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

TOTAL MERCURY

Sample PDI-RB-VV-090718 (580-80213-3) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The sample was prepared and analyzed on 09/21/2018.

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-090718 (580-80213-3) was analyzed for total organic carbon in accordance with SM 5310B. The sample was analyzed on 09/19/2018.

Total Organic Carbon was detected in method blank MB 580-284442/21 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. Because the result concentration was less than ½ the reporting limit, no corrective action was necessary.

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

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description	Ŧ
*	RPD of the LCS and LCSD exceeds the control limits	5
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 C	hemistry	
Qualifier	Qualifier Description	
В	Compound was found in the blank and sample.	 8
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)

5000	iiig/L	00/2-1/10	10.07	00/20/10	•
0020	mg/L	09/24/18	15:57	09/25/18	1
0019	mg/L	09/24/18	15:57	09/25/18	1

TestAmerica Seattle

Client Sample Results

TestAmerica Job ID: 580-80213-6

Lab Sample ID: 580-80213-3

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

Client Sample ID: PDI-RB-VV-090718 Date Collected: 09/07/18 14:50 Date Received: 09/10/18 12:40

Analyte	Result (Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.098	0.018	ug/L		09/12/18 11:48	09/14/18 21:36	1
2-Methylnaphthalene	ND		0.098	0.020	ug/L		09/12/18 11:48	09/14/18 21:36	1
Acenaphthylene	ND		0.20	0.043	ug/L		09/12/18 11:48	09/14/18 21:36	1
Acenaphthene	ND		0.098	0.0059	ug/L		09/12/18 11:48	09/14/18 21:36	1
Fluorene	ND		0.098	0.013	ug/L		09/12/18 11:48	09/14/18 21:36	1
Phenanthrene	ND		0.098	0.019	ug/L		09/12/18 11:48	09/14/18 21:36	1
Anthracene	ND		0.098	0.0069	ug/L		09/12/18 11:48	09/14/18 21:36	1
Fluoranthene	ND		0.098	0.013	ug/L		09/12/18 11:48	09/14/18 21:36	1
Pyrene	ND		0.098	0.0088	ug/L		09/12/18 11:48	09/14/18 21:36	1
Benzo[a]anthracene	ND		0.098	0.0059	ug/L		09/12/18 11:48	09/14/18 21:36	1
Chrysene	ND		0.098	0.0059	ug/L		09/12/18 11:48	09/14/18 21:36	1
Benzo[b]fluoranthene	ND		0.098	0.0059	ug/L		09/12/18 11:48	09/14/18 21:36	1
Benzo[k]fluoranthene	ND		0.098	0.013	ug/L		09/12/18 11:48	09/14/18 21:36	1
Benzo[a]pyrene	ND		0.098	0.034	ug/L		09/12/18 11:48	09/14/18 21:36	1
Indeno[1,2,3-cd]pyrene	ND		0.098	0.0059	ug/L		09/12/18 11:48	09/14/18 21:36	1
Dibenz(a,h)anthracene	ND		0.098	0.0059	ug/L		09/12/18 11:48	09/14/18 21:36	1
Benzo[g,h,i]perylene	ND		0.20	0.075	ug/L		09/12/18 11:48	09/14/18 21:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	83		54 - 120				09/12/18 11:48	09/14/18 21:36	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	ND	*	15	6.1	ug/L		09/12/18 11:48	09/14/18 20:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	100		55 - 126				09/12/18 11:48	09/14/18 20:01	1
—									

Method: Organotins - Organo	tins, PSEP	(GC/MS)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		0.33	0.051	ug/L		09/13/18 15:04	09/22/18 19:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	98		10 - 142				09/13/18 15:04	09/22/18 19:24	1

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

Analyte	Result C	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11	0.067	mg/L		09/18/18 09:05	09/19/18 16:46	1
Motor Oil (>C24-C36)	ND		0.36	0.099	mg/L		09/18/18 09:05	09/19/18 16:46	1
Surrogate	%Recovery G	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	87		50 - 150				09/18/18 09:05	09/19/18 16:46	1

Method: 6020B - Metals (ICP/	ethod: 6020B - Metals (ICP/MS) - Total Recoverable											
Analyte	Result Qu	ualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac				
Arsenic	0.00022 J	0.0010	0.00020	mg/L		09/24/18 15:57	09/25/18 14:13	1				
Cadmium	ND	0.00040	0.00010	mg/L		09/24/18 15:57	09/25/18 14:13	1				
Copper	ND	0.0020	0.00060	mg/L		09/24/18 15:57	09/25/18 14:13	1				
Lead	ND	0.00080	0.00020	mg/L		09/24/18 15:57	09/25/18 14:13	1				
Zinc	0.0026 J	0.0070	0.0019	mg/L		09/24/18 15:57	09/25/18 14:13	1				

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Matrix: Water

Client Sample Results

TestAmerica Job ID: 580-80213-6

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

Client Sample ID: PDI-RB	-VV-09071		Lab Sample ID: 580-80213-3								
Date Collected: 09/07/18 14:50							Matrix: Water				
Date Received: 09/10/18 12:40											
Method: 7470A - Mercury (CV	/AA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Mercury	ND		0.00030	0.00015	mg/L		09/21/18 10:43	09/21/18 15:47	1		
General Chemistry											
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac		
Total Organic Carbon	0.75	JB	1.0	0.19	mg/L			09/19/18 13:23	1		

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

Client Sample ID: Method Blank 5

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Lab Sample ID: MB 580-28 Matrix: Water Analysis Batch: 284020	33783/1-A								Clie	ent Samp	ole ID: Me Prep Typ	ethod be: Tot	Blank al/NA
Analysis Baten. 204020		мв	мв								Перва		50700
Analyte	Re	sult	Qualifier	RL		MDL	Unit	D	Р	repared	Analyz	ed	Dil Fac
Bis(2-ethylhexyl) phthalate		ND		15		6.3	ug/L		09/1	2/18 11:48	09/14/18	18:44	1
		ΜВ	МВ										
Surrogate	%Reco	very	Qualifier	Limits					Р	repared	Analyz	ed	Dil Fac
Terphenyl-d14 (Surr)		80		55 - 126					09/1	2/18 11:48	09/14/18	18:44	1
Lab Sample ID: LCS 580-2 Matrix: Water Analysis Batch: 284020	283783/2-A			Spike	LCS	LCS		Clien	t Sai	mple ID:	Lab Con Prep Typ Prep Ba %Rec.	trol Sa be: Tot tch: 28	ample al/NA 83783
Analyte				Added	Result	Qual	ifier	Unit	D	%Rec	Limits		
Bis(2-ethylhexyl) phthalate				2.00	ND			ug/L		89	20 - 150		
	LCS	LCS	6										
Surrogate	%Recovery	Qua	alifier	Limits									
Terphenyl-d14 (Surr)	60			55 - 126									
Lab Sample ID: LCSD 580 Matrix: Water Analysis Batch: 284020	-283783/3-A						C	lient San	nple	ID: Lab	Control S Prep Typ Prep Ba	Sample be: Tot tch: 2	e Dup al/NA 83783
-				Spike	LCSD	LCSI	D				%Rec.		RPD
Analyte				Added	Result	Qual	ifier	Unit	D	%Rec	Limits	RPD	Limit
Bis(2-ethylhexyl) phthalate				2.00	ND	*		ug/L		142	20 - 150	46	35
	LCSD	LCS	SD										
Surrogate	%Recovery	Qua	alifier	Limits									
Terphenyl-d14 (Surr)	68			55 - 126									

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

Lab Sample ID: MB 580-283783/1-A Matrix: Water Analysis Batch: 284016

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 283783

-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.10	0.018	ug/L		09/12/18 11:48	09/14/18 18:35	1
2-Methylnaphthalene	ND		0.10	0.020	ug/L		09/12/18 11:48	09/14/18 18:35	1
Acenaphthylene	ND		0.20	0.044	ug/L		09/12/18 11:48	09/14/18 18:35	1
Acenaphthene	ND		0.10	0.0060	ug/L		09/12/18 11:48	09/14/18 18:35	1
Fluorene	ND		0.10	0.013	ug/L		09/12/18 11:48	09/14/18 18:35	1
Phenanthrene	ND		0.10	0.019	ug/L		09/12/18 11:48	09/14/18 18:35	1
Anthracene	ND		0.10	0.0070	ug/L		09/12/18 11:48	09/14/18 18:35	1
Fluoranthene	ND		0.10	0.013	ug/L		09/12/18 11:48	09/14/18 18:35	1
Pyrene	ND		0.10	0.0090	ug/L		09/12/18 11:48	09/14/18 18:35	1
Benzo[a]anthracene	ND		0.10	0.0060	ug/L		09/12/18 11:48	09/14/18 18:35	1
Chrysene	ND		0.10	0.0060	ug/L		09/12/18 11:48	09/14/18 18:35	1
Benzo[b]fluoranthene	ND		0.10	0.0060	ug/L		09/12/18 11:48	09/14/18 18:35	1
Benzo[k]fluoranthene	ND		0.10	0.013	ug/L		09/12/18 11:48	09/14/18 18:35	1
Benzo[a]pyrene	ND		0.10	0.035	ug/L		09/12/18 11:48	09/14/18 18:35	1
Indeno[1,2,3-cd]pyrene	ND		0.10	0.0060	ug/L		09/12/18 11:48	09/14/18 18:35	1

QC Sample Results

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

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Lab Sample ID: MB 580-283	3783/1-A							Clie	ent Samp	ole ID: Method	Blank
Matrix: Water										Prep Type: 10	otal/NA
Analysis Batch: 284016	MR	MD								Prep Batch:	283783
Analyto	WiB Rosult	Qualifier	Ы	м	י וחו	Init	п	р	roparod	Analyzod	Dil Eac
Dibenz(a h)anthracene		Quanner	0.10	0.00		ia/l		09/1	2/18 11·48	09/14/18 18:35	1
Benzo[g,h,i]perylene	ND		0.20	0.0	076 u	ig/L		09/1	2/18 11:48	09/14/18 18:35	1
	МВ	MB									
Surrogate	%Recovery	Qualifier	Limits					P	repared	Analyzed	Dil Fac
Terphenyl-d14	73		54 - 120					09/1	2/18 11:48	09/14/18 18:35	1
Lab Sample ID: LCS 580-28	33783/2-A						Clien	it Sai	mple ID:	Lab Control S	Sample
Matrix: Water										Prep Type: To	otal/NA
Analysis Batch: 284016										Prep Batch:	283783
-			Spike	LCS	LCS					%Rec.	
Analyte			Added	Result	Qualif	fier	Unit	D	%Rec	Limits	
Naphthalene			2.00	1.29			ug/L		64	58 - 120	
2-Methylnaphthalene			2.00	1.37			ug/L		69	53 - 120	
Acenaphthylene			2.00	1.46			ug/L		73	33 - 130	
Acenaphthene			2.00	1.44			ug/L		72	64 - 120	
Fluorene			2.00	1.50			ug/L		75	67 - 120	
Phenanthrene			2.00	1.50			ug/L		75	69 - 120	
Anthracene			2.00	1.37			ug/L		68	46 - 127	
Fluoranthene			2.00	1.55			ug/L		77	72 - 120	
Pyrene			2.00	1.53			ug/L		77	57 - 133	
Benzo[a]anthracene			2.00	1.57			ug/L		78	70 - 120	
Chrysene			2.00	1.50			ug/L		75	65 - 120	
Benzo[b]fluoranthene			2.00	1.66			ug/L		83	57 - 132	
Benzo[k]fluoranthene			2.00	1.82			ug/L		91	61 - 132	
Benzo[a]pyrene			2.00	1.32			ug/L		66	23 - 141	
Indeno[1,2,3-cd]pyrene			2.00	1.58			ug/L		79	53 - 133	
Dibenz(a,h)anthracene			2.00	1.74			ug/L		87	57 - 132	
Develop in the Proceeding of			0.00	4					07	F0 100	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
Terphenyl-d14	74		54 - 120

Lab Sample ID: LCSD 580-283783/3-A Matrix: Water Analysis Batch: 284016

Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA Prep Batch: 283783

Analysis Dalch. 204010							гіер Ба	uun. 20	55705
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Naphthalene	2.00	1.58		ug/L		79	58 - 120	20	23
2-Methylnaphthalene	2.00	1.65		ug/L		83	53 - 120	19	23
Acenaphthylene	2.00	1.74		ug/L		87	33 - 130	18	34
Acenaphthene	2.00	1.70		ug/L		85	64 - 120	17	20
Fluorene	2.00	1.77		ug/L		89	67 - 120	16	20
Phenanthrene	2.00	1.73		ug/L		87	69 - 120	15	21
Anthracene	2.00	1.53		ug/L		76	46 - 127	11	19
Fluoranthene	2.00	1.80		ug/L		90	72 - 120	15	21
Pyrene	2.00	1.76		ug/L		88	57 - 133	14	21
Benzo[a]anthracene	2.00	1.68		ug/L		84	70 - 120	7	17
Chrysene	2.00	1.78		ug/L		89	65 - 120	17	19

QC Sample Results

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

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

Lab Sample ID: LCSD 58 Matrix: Water			C	Client S	ample	ID: Lat	Control	Sample be: Tot	e Dup al/NA		
Analysis Batch: 284016 Spike					LCSD				Prep Ba %Rec.	itch: 28	83783 RPD
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzo[b]fluoranthene			2.00	1.95		ug/L		98	57 - 132	16	25
Benzo[k]fluoranthene			2.00	2.04		ug/L		102	61 - 132	11	22
Benzo[a]pyrene			2.00	1.43		ug/L		72	23 - 141	8	35
Indeno[1,2,3-cd]pyrene			2.00	1.84		ug/L		92	53 - 133	15	25
Dibenz(a,h)anthracene			2.00	2.02		ug/L		101	57 - 132	15	24
Benzo[g,h,i]perylene			2.00	1.99		ug/L		100	52 - 129	13	24
	LCSD	LCSD									
Surrogate	%Recovery	Qualifier	Limits								
Terphenvl-d14	84		54 - 120								

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

Lab Sample ID: MB 580-28 Matrix: Water Analysis Batch: 284676	3926/1-A									Clie	ent Samp	ole ID: Me Prep Typ Prep Ba	ethod e: Tot tch: 2	Blank al/NA 33926
		MB	МВ											
Analyte	Re	sult	Qualifier		RL	I	MDL	Unit	D	Р	repared	Analyz	ed	Dil Fac
Tributyltin		ND			0.30	0	.046	ug/L		09/1	3/18 15:04	09/22/18	16:45	1
		ΜВ	MB											
Surrogate	%Reco	very	Qualifier	Lin	nits					P	repared	Analyz	ed	Dil Fac
Tripentyltin		98		10.	. 142					09/1	3/18 15:04	09/22/18	16:45	1
Lab Sample ID: LCS 580-2 Matrix: Water Analysis Batch: 284676	83926/2-A			Spike		LCS	LCS	ł	Clien	t Saı	nple ID:	Lab Con Prep Typ Prep Ba %Rec.	trol Sa e: Tot tch: 28	imple al/NA 33926
Analyte				Added		Result	Qua	lifier	Unit	D	%Rec	Limits		
Tributyltin				0.898		0.900			ug/L		100	11 - 150		
	LCS	LCS	;											
Surrogate	%Recovery	Qua	lifier	Limits										
Tripentyltin	105			10 - 142	_									
Lab Sample ID: LCSD 580- Matrix: Water Analysis Batch: 284676	-283926/3-A			0.11				с _	lient San	nple	ID: Lab	Control S Prep Typ Prep Ba	Sample be: Tot tch: 28	e Dup al/NA 33926
				Spike		LCSD	LCS	D	11	_	0/ D	%Rec.		RPD
Analyte				Added		Result	Qua	litier			%Rec	Limits		Limit
moutyilli				0.098		1.03			ug/L		115	11-150	13	30
	LCSD	LCS	SD											
Surrogate	%Recovery	Qua	lifier	Limits	_									
Tripentyltin	110			10 - 142										

Analysis Batch: 284335

Prep Type: Total/NA

Prep Batch: 284200

С 6 1 1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)									
Lab Sample ID: MB 580-284200/1-A	Client Sample ID: Method Blank								
Matrix: Water	Prep Type: Total/NA								

-		MB MB								
Analyte	Res	ult Qualifier	· RL	MC)L Unit	D	Pre	epared	Analyzed	Dil Fa
#2 Diesel (C10-C24)	<u> </u>	ND	0.11	0.06	55 mg/L		09/18	/18 09:05	09/19/18 15:39	
Motor Oil (>C24-C36)	I	ND	0.35	0.09	96 mg/L		09/18/	/18 09:05	09/19/18 15:39	
	I	MB MB								
Surrogate	%Recov	ery Qualifier	r Limits				Pre	epared	Analyzed	Dil Fa
o-Terphenyl		84	50 - 150				09/18	/18 09:05	09/19/18 15:39	
Matrix: Water Analysis Batch: 284335									Prep Type: To Prep Batch:	otal/NA 28420
Analysis Batch: 284335			Spiko		~					284200
Analyte			Added	Result Q	ualifier	Unit	D	%Rec	Limits	
#2 Diesel (C10-C24)			2.00	1.24		mg/L		62	50 - 120	
Motor Oil (>C24-C36)			2.00	1.78		mg/L		89	64 - 120	
	LCS	LCS								
Surrogate	%Recovery	Qualifier	Limits							

j	, ,	
o-Terphenyl	88	 50 - 150

Lab Sample ID: LCSD 580 Matrix: Water		C	Client Sa	mple	ID: Lat	Control Prep Ty	Sample pe: Tot	<mark>∌ Dup</mark> al/NA			
Analysis Batch: 284335									Prep Ba	itch: 28	34200
			Spike	LCSD	LCSD				%Rec.		RPD
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
#2 Diesel (C10-C24)			2.00	1.33		mg/L		66	50 - 120	7	26
Motor Oil (>C24-C36)			2.00	1.82		mg/L		91	64 - 120	2	24
	LCSD	LCSD									
Surrogate	%Recovery	Qualifier	Limits								
o-Terphenyl	115		50 - 150								

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-284793/22-A Matrix: Water Analysis Batch: 284913 MB MB						Client Sample ID: Method Blank Prep Type: Total Recoverable Prep Batch: 284793						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac			
Arsenic	ND		0.0010	0.00020	mg/L		09/24/18 15:57	09/25/18 13:30	1			
Cadmium	ND		0.00040	0.00010	mg/L		09/24/18 15:57	09/25/18 13:30	1			
Copper	ND		0.0020	0.00060	mg/L		09/24/18 15:57	09/25/18 13:30	1			
Lead	ND		0.00080	0.00020	mg/L		09/24/18 15:57	09/25/18 13:30	1			
Zinc	ND		0.0070	0.0019	mg/L		09/24/18 15:57	09/25/18 13:30	1			

Lab Sample ID: LCS 580-284793/23-A		Client Sample ID: Lab Control Sample						
Matrix: Water				P	rep Typ	be: Total	Recoverable	
Analysis Batch: 284913						Prep Ba	atch: 284793	
-	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Arsenic	4.00	4.03		mg/L		101	80 - 120	

Spike

Added

0.100

0.500

1.00

4.00

LCS LCS

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

Lab Sample ID: LCS 580-284793/23-A

Lab Sample ID: LCSD 580-284793/24-A

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

Prep Type: Total Recoverable

%Rec.

Prep Batch: 284793

Client Sample ID: Lab Control Sample

Result Qualifier Limits Unit D %Rec 0.103 80 - 120 mg/L 103 0.503 mg/L 101 80 - 120 0.978 mg/L 98 80 - 120 3.99 mg/L 100 80 - 120 **Client Sample ID: Lab Control Sample Dup Prep Type: Total Recoverable**

Matrix: Water Analysis Batch: 284913

Analysis Batch: 284913

Matrix: Water

Analyte

Copper

Lead

Zinc

Cadmium

						Ргер ва	itch: 28	34793
Spike	LCSD	LCSD				%Rec.		RPD
Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
4.00	3.99		mg/L		100	80 - 120	1	20
0.100	0.101		mg/L		101	80 - 120	2	20
0.500	0.499		mg/L		100	80 - 120	1	20
1.00	0.974		mg/L		97	80 - 120	0	20
4.00	3.98		mg/L		100	80 - 120	0	20
	Spike Added 4.00 0.100 0.500 1.00 4.00	Spike LCSD Added Result 4.00 3.99 0.100 0.101 0.500 0.499 1.00 0.974 4.00 3.98	Spike LCSD LCSD Added Result Qualifier 4.00 3.99	Spike LCSD LCSD Added Result Qualifier Unit 4.00 3.99 mg/L 0.100 0.101 mg/L 0.500 0.499 mg/L 1.00 0.974 mg/L 4.00 3.98 mg/L	Spike LCSD LCSD Added Result Qualifier Unit D 4.00 3.99 mg/L mg/L D 0.100 0.101 mg/L mg/L D 0.500 0.499 mg/L mg/L D 1.00 0.974 mg/L mg/L D 4.00 3.98 mg/L Mg/L Mg/L D	Spike LCSD LCSD Added Result Qualifier Unit D %Rec 4.00 3.99 mg/L 100 100 0.100 0.101 mg/L 101 0.500 0.499 mg/L 100 1.00 0.974 mg/L 97 4.00 3.98 mg/L 100	Spike LCSD LCSD Wrep Ba Added Result Qualifier Unit D %Rec. %Rec. 4.00 3.99 mg/L 100 80 - 120 0.100 0.101 mg/L 101 80 - 120 0.500 0.499 mg/L 100 80 - 120 1.00 0.974 mg/L 97 80 - 120 4.00 3.98 mg/L 100 80 - 120	Spike LCSD LCSD Unit D %Rec. %Rec. 4.00 3.99 mg/L 100 80-120 1 0.100 0.101 mg/L 101 80-120 1 0.500 0.499 mg/L 100 80-120 1 1.00 0.974 mg/L 97 80-120 0 4.00 3.98 mg/L 100 80-120 0

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-28 Matrix: Water Analysis Batch: 284734	34560/20-A MB	МВ							Clie	ent Samp	ole ID: M Prep Ty Prep Ba	ethod pe: To atch: 2	Blank tal/NA 284560
Analyte	Result	Qualifier		RL	Ν	/IDL Un	it	D	Ρ	repared	Analy	zed	Dil Fac
Mercury	ND		0.000	030	0.00	015 mg	/L		09/2	1/18 10:43	09/21/18	15:17	1
Lab Sample ID: LCS 580-2 Matrix: Water Analysis Batch: 284734	84560/21-A		Spike Added	R	LCS	LCS Qualifie	CI r Unit	lient	Sar	mple ID: %Rec	Lab Cor Prep Ty Prep Ba %Rec.	ntrol S pe: To atch: 2	ample tal/NA 284560
Mercury			0.00200	0.0	0200		mg/L			100	80 - 120		
Lab Sample ID: LCSD 580 Matrix: Water Analysis Batch: 284734	-284560/22-A						Client	Sam	ple	ID: Lab	Control Prep Ty Prep Ba	Samp pe: To atch: 2	le Dup tal/NA 284560
-			Spike	L	.CSD	LCSD					%Rec.		RPD
Analyte			Added	Re	esult	Qualifie	r Unit		D	%Rec	Limits	RPD	Limit
Mercury			0.00200	0.0	0201		mg/L			101	80 - 120	0	20

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

Lab Sample ID: MB 580-284442/21 Matrix: Water Analysis Batch: 284442							Client Sam	ple ID: Method Prep Type: To	l Blank otal/NA
,	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	0.423	J	1.0	0.19	mg/L			09/19/18 13:23	1

5 6

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

Lab Sample ID: LCS 580-284442/22 Matrix: Water Analysis Batch: 284442				Clier	nt Sar	nple ID	: Lab Control Sample Prep Type: Total/NA
	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Total Organic Carbon	10.0	9.86		mg/L		99	85 - 115

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

580-80213-3 Matrix: Water

Client Sample ID: PDI-RB-VV-090718
Date Collected: 09/07/18 14:50
Date Received: 09/10/18 12:40

Lab Sa	ample	ID:	580)-80	21	3.
			Ma	+	14/	-+

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			283783	09/12/18 11:48	JSM	TAL SEA
Total/NA	Analysis	8270D		1	284020	09/14/18 20:01	T1W	TAL SEA
Total/NA	Prep	3520C			283783	09/12/18 11:48	JSM	TAL SEA
Total/NA	Analysis	8270D SIM		1	284016	09/14/18 21:36	CJ	TAL SEA
Total/NA	Prep	Organotin			283926	09/13/18 15:04	JSM	TAL SEA
Total/NA	Analysis	Organotins		1	284676	09/22/18 19:24	ERZ	TAL SEA
Total/NA	Prep	3510C			284200	09/18/18 09:05	KS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	284335	09/19/18 16:46	JCM	TAL SEA
Total Recoverable	Prep	3005A			284793	09/24/18 15:57	JKM	TAL SEA
Total Recoverable	Analysis	6020B		1	284913	09/25/18 14:13	FCW	TAL SEA
Total/NA	Prep	7470A			284560	09/21/18 10:43	T1H	TAL SEA
Total/NA	Analysis	7470A		1	284734	09/21/18 15:47	FCW	TAL SEA
Total/NA	Analysis	SM 5310B		1	284442	09/19/18 13:23	TTN	TAL SEA

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM Project/Site: Portland Harbor Pre-Remedial Design TestAmerica Job ID: 580-80213-6

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

Sample Summary

TestAmerica Job ID: 580-80213-6

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-80213-3	PDI-RB-VV-090718	Water	09/07/18 14:50	09/10/18 12:40

9/27/2018

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Sample Identification	Sample Date	Sample Time	Matrix	QC Sample	Sampler's Initials	Totał No. of Cont.	Fraction	PCB Curl	PCDD/E4	TPH Dieve 6820B, 747	Grain siz	Total org	Archive A	PAHs. BF LL, Kron	WQ - PCI	NQ - PCI	WQ - TPI	WQ - Met	WQ - Tot	WQ - PAI	WQ - Pest	MQ - BEI	WQ - Trit	Sample Specific Notes:
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Container Type: WMG=Wide Mouth Glass Jar, P=HDPE,	PP=Polypro	povlene, A	G≕amber o	lass. G≃ola	ss. RC=Res	n Column																		
Preservative: HCI = Hydrochloric Acid, H3PO4 = Phosph	oric Acid, H	INO3 = Nit	tric Acid																					
Fraction: D = Dissolved, PRT = Particulate, T = Total (unfiltered	l)							Samp	le Disp	osal			<u>-</u>			ـــــــــــــــــــــــــــــــــــــ	<u>-</u>				ł	I		
Special Instructions/QC Requirements & Comments:									Return	10 CIK	enr		(jispo:	sal By I	.ab		(Irchi	ve For	12 M	onths	-			
Analyze samples for grain size ASAP, Hold (H) remai	ning analys	ses pendin	ig further in	struction.																			1	1
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Login Sample Receipt Checklist

Client: AECOM

Login Number: 80213 List Number: 1 Creator: Antonson, Angeline D

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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	

Job Number: 580-80213-6

List Source: TestAmerica Seattle