



07 March 2019

Karen Mixon
AECOM
1111 Third Avenue, Suite 1600
Seattle, WA 98101

RE: Portland Harbor Pre-Remedial Design

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
19B0242	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 19B0242	Turn-around Requested:	Date: 2/20/2019
ARI Client Company: AECOM	Phone: (206) 438-2261 / (206) 438-2010	Page: 1 of 1
Client Contact: Amy Dahl/Chelsey Cook		No. of Coolers: 1 Cooler Temps: 4.1



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)

Client Project Name: Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling	Analysis Requested							Notes/Comments
Client Project #: 60566335	Samplers: MT, KD, ED	PCP 8041	TOC	DOC				

Sample ID	Date	Time	Matrix	No. Containers	PCP 8041	TOC	DOC										
PDI-WS-T01-1902	02/18/19	20:15	W	4	✓	✓	✓										
PDI-WS-T02-1902	02/18/19	21:36	W	4	✓	✓	✓										
PDI-WS-T03-1902	02/18/19	11:31	W	4	✓	✓	✓										
PDI-WS-T04-1902	02/17/19	19:35	W	4	✓	✓	✓										
PDI-WS-T05-1902	02/17/19	19:17	W	4	✓	✓	✓										

Comments/Special Instructions	Relinquished by: (Signature) <i>JPR</i>	Received by: (Signature) <i>Stephanie Fishel</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: JENNIFER RAY	Printed Name: Stephanie Fishel	Printed Name:	Printed Name:
	Company: AECOM	Company: AEC	Company:	Company:
	Date & Time: 2/20/19 1500	Date & Time: 2-21-19 1253	Date & Time:	Date & Time:

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.



AECOM
1111 Third Avenue, Suite 1600
Seattle WA, 98101

Project: Portland Harbor Pre-Remedial Design
Project Number: 60566335
Project Manager: Karen Mixon

Reported:
07-Mar-2019 10:22

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PDI-WS-T01-1902	19B0242-01	Water	18-Feb-2019 20:15	21-Feb-2019 12:53
PDI-WS-T02-1902	19B0242-02	Water	18-Feb-2019 21:24	21-Feb-2019 12:53
PDI-WS-T03-1902	19B0242-03	Water	18-Feb-2019 11:31	21-Feb-2019 12:53
PDI-WS-T04-1902	19B0242-04	Water	17-Feb-2019 19:35	21-Feb-2019 12:53
PDI-WS-T05-1902	19B0242-05	Water	17-Feb-2019 19:17	21-Feb-2019 12:53



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Project: Portland Harbor Pre-Remedial Design
Project Number: 60566335
Project Manager: Karen Mixon

Reported:
07-Mar-2019 10:22

Work Order Case Narrative

Sample receipt

Samples as listed on the preceding page were received February 21, 2019 under ARI work order 19B0242. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Pentachlorophenol - EPA Method SW8041A

The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements, with the exception of SHC0034-CCV1 which is outside of control limits high for first column Pentachlorophenol and the surrogate 2,4,6-Tribromophenol. Data reported from passing columns. No corrective action was taken.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS percent recoveries were within control limits.

A matrix spike and matrix spike duplicate were prepared in conjunction with sample PDI-WS-T01-1902. The matrix spike/matrix spike duplicate percent recoveries and RPD were within QC limits.

Total and Dissolved Organic Carbon - Method SM5310

The samples were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Matrix spikes, matrix spike duplicates and duplicates were prepared in conjunction with sample PDI-WS-T01-1902. The matrix spikes and matrix spike duplicates have low spike recoveries. This is likely due to matrix interference. The results are advisory. All other matrix spike duplicate and duplicate RPD were within QC limits. No corrective action was taken.



WORK ORDER

19B0242

Client: AECOM Project Manager: Amanda Volgardsen
Project: Portland Harbor Pre-Remedial Design Project Number: Portland Harbor

Preservation Confirmation

Container ID	Container Type	pH
19B0242-01 A	Glass NM, Amber, 500 mL	
19B0242-01 B	Glass NM, Amber, 500 mL	
19B0242-01 C	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-01 D	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-02 A	Glass NM, Amber, 500 mL	
19B0242-02 B	Glass NM, Amber, 500 mL	
19B0242-02 C	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-02 D	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-03 A	Glass NM, Amber, 500 mL	
19B0242-03 B	Glass NM, Amber, 500 mL	
19B0242-03 C	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-03 D	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-04 A	Glass NM, Amber, 500 mL	
19B0242-04 B	Glass NM, Amber, 500 mL	
19B0242-04 C	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-04 D	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-05 A	Glass NM, Amber, 500 mL	
19B0242-05 B	Glass NM, Amber, 500 mL	
19B0242-05 C	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass
19B0242-05 D	Glass NM, Amber, 250 mL, 9N H2SO4	L2 pass

Preservation Confirmed By See

Date 2-21-19



WORK ORDER

19B0242

Client: AECOM **Project Manager:** Amanda Volgardsen
Project: Portland Harbor Pre-Remedial Design **Project Number:** Portland Harbor

Report To:
AECOM
Karen Mixon
1111 Third Avenue, Suite 1600
Seattle, WA 98101
Phone: (206) 438-2700
Fax: 1(206) 438-2699

Invoice To:
AECOM
Accounts Payable
PO Box 203970
Austin, TX 78720-3970
Phone : (206) 438-2700
Fax: (866) 495-5288

Date Due: 07-Mar-2019 18:00 (10 day TAT)

Received By: Stephanie Fishel

Date Received: 21-Feb-2019 12:53

Logged In By: Stephanie Fishel

Date Logged In: 21-Feb-2019 16:58

Samples Received at: 4.1°C

Intact, properly signed and dated custody seals attached to outside of cooler(s).....Yes	Custody papers included with the cooler.....	Yes
Custody papers properly filled out (in, signed, analyses requested, etc).....Yes	Was a temperature blank included in the cooler.....	Yes
Was sufficient ice used (if appropriate).....Yes	All bottles sealed in individual plastic bags.....	No
All bottles arrived in good condition (unbroken).....Yes	All bottle labels complete and legible.....	Yes
Number of containers listed on COC match number received.....Yes	Bottle labels and tags agree with COC.....	Yes
Correct bottles used for the requested analyses.....Yes	All VOC vials free of air bubbles.....	No
Analyses/bottles require preservation (attach preservation sheet excluding VOC)..Yes	Sufficient amount of sample sent in each bottle.....	Yes
Sample split at ARI.....No		

19B0242-01 PDI-WS-T01-1902 [Water] Sampled 18-Feb-2019 20:15

8041A Pentachlorophenol Low Level	03/07/2019	10	2/25/2019	DOC is field filtered
Carbon, Organic Dissolved SM 5310 B-00	03/07/2019	10	3/18/2019	DOC is field filtered
Carbon, Organic Total, SM 5310 B-00	03/07/2019	10	3/18/2019	DOC is field filtered

19B0242-02 PDI-WS-T02-1902 [Water] Sampled 18-Feb-2019 21:24

8041A Pentachlorophenol Low Level	03/07/2019	10	2/25/2019	DOC is field filtered
Carbon, Organic Dissolved SM 5310 B-00	03/07/2019	10	3/18/2019	DOC is field filtered
Carbon, Organic Total, SM 5310 B-00	03/07/2019	10	3/18/2019	DOC is field filtered

19B0242-03 PDI-WS-T03-1902 [Water] Sampled 18-Feb-2019 11:31

8041A Pentachlorophenol Low Level	03/07/2019	10	2/25/2019	DOC is field filtered
Carbon, Organic Dissolved SM 5310 B-00	03/07/2019	10	3/18/2019	DOC is field filtered
Carbon, Organic Total, SM 5310 B-00	03/07/2019	10	3/18/2019	DOC is field filtered

19B0242-04 PDI-WS-T04-1902 [Water] Sampled 17-Feb-2019 19:35

8041A Pentachlorophenol Low Level	03/07/2019	10	2/24/2019	DOC is field filtered
Carbon, Organic Dissolved SM 5310 B-00	03/07/2019	10	3/17/2019	DOC is field filtered
Carbon, Organic Total, SM 5310 B-00	03/07/2019	10	3/17/2019	DOC is field filtered

19B0242-05 PDI-WS-T05-1902 [Water] Sampled 17-Feb-2019 19:17

8041A Pentachlorophenol Low Level	03/07/2019	10	2/24/2019	DOC is field filtered
Carbon, Organic Dissolved SM 5310 B-00	03/07/2019	10	3/17/2019	DOC is field filtered
Carbon, Organic Total, SM 5310 B-00	03/07/2019	10	3/17/2019	DOC is field filtered



Cooler Receipt Form

ARI Client: ARCOM

Project Name: Portland Harbor

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 19B0242

Tracking No: 785611280509 NA

Preliminary Examination Phase:

- Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
- Were custody papers included with the cooler? YES NO
- Were custody papers properly filled out (ink, signed, etc.) YES NO
- Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1253 4.1
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DC02568

Cooler Accepted by: sef Date: 2-21-19 Time: 1253

Complete custody forms and attach all shipping documents

Log-In Phase:

- Was a temperature blank included in the cooler? YES NO
- What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
- Was sufficient ice used (if appropriate)? NA YES NO
- Were all bottles sealed in individual plastic bags? YES NO
- Did all bottles arrive in good condition (unbroken)? YES NO
- Were all bottle labels complete and legible? YES NO
- Did the number of containers listed on COC match with the number of containers received? YES NO
- Did all bottle labels and tags agree with custody papers? YES NO
- Were all bottles used correct for the requested analyses? YES NO
- Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
- Were all VOC vials free of air bubbles? NA YES NO
- Was sufficient amount of sample sent in each bottle? YES NO
- Date VOC Trip Blank was made at ARI..... NA
- Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: sef Date: 2-21-19 Time: 1658 Labels checked by: sef

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



AECOM
1111 Third Avenue, Suite 1600
Seattle WA, 98101

Project: Portland Harbor Pre-Remedial Design
Project Number: 60566335
Project Manager: Karen Mixon

Reported:
07-Mar-2019 10:22

PDI-WS-T01-1902
19B0242-01 (Water)

Phenols

Method: EPA 8041A Sampled: 02/18/2019 20:15
Instrument: ECD8 Analyst: yz Analyzed: 02/28/2019 15:43

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 19B0242-01 A 01
Preparation Batch: BHB0491 Sample Size: 500 mL
Prepared: 22-Feb-2019 Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>				10-181 %	109	%	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>				10-181 %	83.2	%	



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PDI-WS-T01-1902
19B0242-01 (Water)

Wet Chemistry

Method: SM 5310 B-00 Sampled: 02/18/2019 20:15
Instrument: TOC-LCSH Analyst: BF Analyzed: 02/22/2019 23:29

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19B0242-01 C
Preparation Batch: BHB0499 Sample Size: 20 mL
Prepared: 22-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	3.06	mg/L	

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19B0242-01 D
Preparation Batch: BHB0590 Sample Size: 20 mL
Prepared: 27-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Organic Carbon, Dissolved		1	0.50	0.50	2.67	mg/L	



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PDI-WS-T02-1902
19B0242-02 (Water)

Phenols

Method: EPA 8041A	Preparation Method: EPA 3510C SepF	Sample Size: 500 mL	Sampled: 02/18/2019 21:24
Instrument: ECD8 Analyst: yz	Preparation Batch: BHB0491	Final Volume: 5 mL	Analyzed: 02/28/2019 16:36
Sample Preparation:	Prepared: 22-Feb-2019		Extract ID: 19B0242-02 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>					10-181 %	122	%
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>					10-181 %	104	%



AECOM 1111 Third Avenue, Suite 1600 Seattle WA, 98101	Project: Portland Harbor Pre-Remedial Design Project Number: 60566335 Project Manager: Karen Mixon	Reported: 07-Mar-2019 10:22
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PDI-WS-T02-1902
19B0242-02 (Water)

Wet Chemistry

Method: SM 5310 B-00
Instrument: TOC-LCSH Analyst: BF

Sampled: 02/18/2019 21:24
Analyzed: 02/23/2019 01:24

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BHB0499 Sample Size: 20 mL
Prepared: 22-Feb-2019 Final Volume: 20 mL

Extract ID: 19B0242-02 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	4.31	mg/L	

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BHB0590 Sample Size: 20 mL
Prepared: 27-Feb-2019 Final Volume: 20 mL

Extract ID: 19B0242-02 D

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Organic Carbon, Dissolved		1	0.50	0.50	3.75	mg/L	



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PDI-WS-T03-1902
19B0242-03 (Water)

Phenols

Method: EPA 8041A	Preparation Method: EPA 3510C SepF	Sample Size: 500 mL	Sampled: 02/18/2019 11:31
Instrument: ECD8 Analyst: yz	Preparation Batch: BHB0491	Final Volume: 5 mL	Analyzed: 02/28/2019 16:54
Sample Preparation:	Prepared: 22-Feb-2019		Extract ID: 19B0242-03 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>					10-181 %	102	%
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>					10-181 %	83.5	%



AECOM 1111 Third Avenue, Suite 1600 Seattle WA, 98101	Project: Portland Harbor Pre-Remedial Design Project Number: 60566335 Project Manager: Karen Mixon	Reported: 07-Mar-2019 10:22
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PDI-WS-T03-1902
19B0242-03 (Water)

Wet Chemistry

Method: SM 5310 B-00 Sampled: 02/18/2019 11:31
Instrument: TOC-LCSH Analyst: BF Analyzed: 02/23/2019 01:43
Sample Preparation: Extract ID: 19B0242-03 C
Preparation Method: No Prep Wet Chem
Preparation Batch: BHB0499 Sample Size: 20 mL
Prepared: 22-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	2.82	mg/L	

Sample Preparation: Extract ID: 19B0242-03 D
Preparation Method: No Prep Wet Chem
Preparation Batch: BHB0590 Sample Size: 20 mL
Prepared: 27-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Organic Carbon, Dissolved		1	0.50	0.50	2.35	mg/L	



AECOM 1111 Third Avenue, Suite 1600 Seattle WA, 98101	Project: Portland Harbor Pre-Remedial Design Project Number: 60566335 Project Manager: Karen Mixon	Reported: 07-Mar-2019 10:22
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PDI-WS-T04-1902
19B0242-04 (Water)

Phenols

Method: EPA 8041A	Preparation Method: EPA 3510C SepF	Sample Size: 500 mL	Sampled: 02/17/2019 19:35
Instrument: ECD8 Analyst: yz	Preparation Batch: BHB0491	Final Volume: 5 mL	Analyzed: 02/28/2019 17:12
Sample Preparation:	Prepared: 22-Feb-2019		Extract ID: 19B0242-04 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>					10-181 %	99.8 %	
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>					10-181 %	77.1 %	



AECOM 1111 Third Avenue, Suite 1600 Seattle WA, 98101	Project: Portland Harbor Pre-Remedial Design Project Number: 60566335 Project Manager: Karen Mixon	Reported: 07-Mar-2019 10:22
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PDI-WS-T04-1902
19B0242-04 (Water)

Wet Chemistry

Method: SM 5310 B-00 Sampled: 02/17/2019 19:35
 Instrument: TOC-LCSH Analyst: BF Analyzed: 02/23/2019 02:01
 Sample Preparation: Extract ID: 19B0242-04 C
 Preparation Method: No Prep Wet Chem
 Preparation Batch: BHB0499 Sample Size: 20 mL
 Prepared: 22-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	3.38	mg/L	

Sample Preparation: Extract ID: 19B0242-04 D
 Preparation Method: No Prep Wet Chem
 Preparation Batch: BHB0590 Sample Size: 20 mL
 Prepared: 27-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Organic Carbon, Dissolved		1	0.50	0.50	3.35	mg/L	



AECOM 1111 Third Avenue, Suite 1600 Seattle WA, 98101	Project: Portland Harbor Pre-Remedial Design Project Number: 60566335 Project Manager: Karen Mixon	Reported: 07-Mar-2019 10:22
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PDI-WS-T05-1902
19B0242-05 (Water)

Phenols

Method: EPA 8041A	Preparation Method: EPA 3510C SepF	Sample Size: 500 mL	Sampled: 02/17/2019 19:17
Instrument: ECD8 Analyst: yz	Preparation Batch: BHB0491	Final Volume: 5 mL	Analyzed: 02/28/2019 17:30
Sample Preparation:	Prepared: 22-Feb-2019		Extract ID: 19B0242-05 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Pentachlorophenol	87-86-5	1	0.014	0.025	ND	ug/L	U
<i>Surrogate: 2,4,6-Tribromophenol</i>					10-181 %	106	%
<i>Surrogate: 2,4,6-Tribromophenol [2C]</i>					10-181 %	102	%



AECOM 1111 Third Avenue, Suite 1600 Seattle WA, 98101	Project: Portland Harbor Pre-Remedial Design Project Number: 60566335 Project Manager: Karen Mixon	Reported: 07-Mar-2019 10:22
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PDI-WS-T05-1902
19B0242-05 (Water)

Wet Chemistry

Method: SM 5310 B-00 Sampled: 02/17/2019 19:17
Instrument: TOC-LCSH Analyst: BF Analyzed: 02/23/2019 02:20
Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19B0242-05 C
Preparation Batch: BHB0499 Sample Size: 20 mL
Prepared: 22-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	3.12	mg/L	

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19B0242-05 D
Preparation Batch: BHB0590 Sample Size: 20 mL
Prepared: 27-Feb-2019 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Organic Carbon, Dissolved		1	0.50	0.50	2.20	mg/L	



AECOM
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Seattle WA, 98101

Project: Portland Harbor Pre-Remedial Design
Project Number: 60566335
Project Manager: Karen Mixon

Reported:
07-Mar-2019 10:22

Phenols - Quality Control

Batch BHB0491 - EPA 3510C SepF

Instrument: ECD8 Analyst: yz

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0491-BLK1)						Prepared: 22-Feb-2019 Analyzed: 28-Feb-2019 15:07					
Pentachlorophenol	ND	0.014	0.025	ug/L							U
Surrogate: 2,4,6-Tribromophenol	0.166			ug/L	0.250		66.3	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.139			ug/L	0.250		55.7	10-181			
LCS (BHB0491-BS1)						Prepared: 22-Feb-2019 Analyzed: 28-Feb-2019 15:25					
Pentachlorophenol	0.107	0.014	0.025	ug/L	0.250		42.8	36-159			
Surrogate: 2,4,6-Tribromophenol	0.178			ug/L	0.250		71.0	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.142			ug/L	0.250		56.9	10-181			
Matrix Spike (BHB0491-MS1)						Source: 19B0242-01 Prepared: 22-Feb-2019 Analyzed: 28-Feb-2019 16:01					
Pentachlorophenol	0.379	0.028	0.050	ug/L	0.500	ND	75.8	36-159			
Surrogate: 2,4,6-Tribromophenol	0.429			ug/L	0.500		85.7	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.442			ug/L	0.500		88.4	10-181			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BHB0491-MSD1)						Source: 19B0242-01 Prepared: 22-Feb-2019 Analyzed: 28-Feb-2019 16:18					
Pentachlorophenol	0.456	0.031	0.056	ug/L	0.556	ND	82.0	36-159	18.30	30	
Surrogate: 2,4,6-Tribromophenol	0.524			ug/L	0.556		94.3	10-181			
Surrogate: 2,4,6-Tribromophenol [2C]	0.447			ug/L	0.556		80.5	10-181			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project: Portland Harbor Pre-Remedial Design
Project Number: 60566335
Project Manager: Karen Mixon

Reported:
07-Mar-2019 10:22

Wet Chemistry - Quality Control

Batch BHB0499 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0499-BLK1)						Prepared: 22-Feb-2019 Analyzed: 22-Feb-2019 17:17					
Total Organic Carbon	ND	0.50	0.50	mg/L							U
LCS (BHB0499-BS1)						Prepared: 22-Feb-2019 Analyzed: 22-Feb-2019 17:43					
Total Organic Carbon	18.87	0.50	0.50	mg/L	20.00		94.4	90-110			
Duplicate (BHB0499-DUP1)						Source: 19B0242-01 Prepared: 22-Feb-2019 Analyzed: 22-Feb-2019 23:48					
Total Organic Carbon	3.14	0.50	0.50	mg/L		3.06			2.74	20	
Matrix Spike (BHB0499-MS1)						Source: 19B0242-01 Prepared: 22-Feb-2019 Analyzed: 23-Feb-2019 00:07					
Total Organic Carbon	17.71	0.50	0.50	mg/L	20.04	3.06	73.1	75-125			*
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BHB0499-MSD1)						Source: 19B0242-01 Prepared: 22-Feb-2019 Analyzed: 23-Feb-2019 00:26					
Total Organic Carbon	18.00	0.50	0.50	mg/L	20.04	3.06	74.6	75-125	1.62	20	*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Wet Chemistry - Quality Control

Batch BHB0590 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHB0590-BLK1)						Prepared: 27-Feb-2019 Analyzed: 27-Feb-2019 13:37					
Dissolved Organic Carbon, Dissolved	ND	0.50	0.50	mg/L							U
LCS (BHB0590-BS1)						Prepared: 27-Feb-2019 Analyzed: 27-Feb-2019 13:55					
Dissolved Organic Carbon, Dissolved	18.85	0.50	0.50	mg/L	20.00		94.3	90-110			
Duplicate (BHB0590-DUP1)						Source: 19B0242-01 Prepared: 27-Feb-2019 Analyzed: 27-Feb-2019 14:39					
Dissolved Organic Carbon, Dissolved	2.50	0.50	0.50	mg/L		2.67			6.49	20	
Matrix Spike (BHB0590-MS1)						Source: 19B0242-01 Prepared: 27-Feb-2019 Analyzed: 27-Feb-2019 15:01					
Dissolved Organic Carbon, Dissolved	17.04	0.50	0.50	mg/L	20.04	2.67	71.7	75-125			*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BHB0590-MSD1)						Source: 19B0242-01 Prepared: 27-Feb-2019 Analyzed: 27-Feb-2019 15:19					
Dissolved Organic Carbon, Dissolved	17.17	0.50	0.50	mg/L	20.04	2.67	72.3	75-125	0.76	20	*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Certified Analyses included in this Report

Analyte	Certifications
SM 5310 B-00 in Water	
Dissolved Organic Carbon	WADOE,WA-DW,NELAP
Total Organic Carbon	WA-DW,WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019



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Notes and Definitions

- * Flagged value is not within established control limits.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.