



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
29-Sep-2021 14:03

Metals and Metallic Compounds - Quality Control

Batch BJI0217 - REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0217-BS1)						Prepared: 08-Sep-2021 Analyzed: 08-Sep-2021 16:11						
Cadmium	114	25.3	0.0400	0.100	ug/L	25.0		101	80-120			
Copper	63	25.0	0.173	0.500	ug/L	25.0		99.9	80-120			
Copper	65	25.1	0.350	0.500	ug/L	25.0		100	80-120			
Nickel	60	24.9	0.0792	0.500	ug/L	25.0		99.5	80-120			
Nickel	62	25.4	0.220	0.500	ug/L	25.0		101	80-120			
Zinc	66	77.1	2.92	6.00	ug/L	80.0		96.3	80-120			
Zinc	67	74.0	0.940	6.00	ug/L	80.0		92.5	80-120			
LCS (BJI0217-BS2)						Prepared: 08-Sep-2021 Analyzed: 10-Sep-2021 16:09						
Iron	54	5020	18.2	36.0	ug/L	5000		100	80-120			
Iron	57	4900	6.63	36.0	ug/L	5000		97.9	80-120			
Vanadium	51a	24.4	0.0556	0.200	ug/L	25.0		97.5	80-120			
Vanadium	51b	24.4	0.0521	0.200	ug/L	25.0		97.7	80-120			
Cobalt	59	24.6	0.0178	0.200	ug/L	25.0		98.5	80-120			
Selenium	78	76.7	0.179	0.500	ug/L	80.0		95.9	80-120			



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
29-Sep-2021 14:03

Metals and Metallic Compounds - Quality Control

Batch BJI0293 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0293-BLK1)						Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:41					
Mercury	0.000032	0.000013	0.000100	mg/L							J
LCS (BJI0293-BS1)						Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:44					
Mercury	0.00175	0.000013	0.000100	mg/L	0.00200		87.5	80-120			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 29-Sep-2021 14:03

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0347 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0347-BLK1)						Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:05					
Mercury, Dissolved	0.000028	0.000013	0.000100	mg/L							J
LCS (BJI0347-BS1)						Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:07					
Mercury, Dissolved	0.00187	0.000013	0.000100	mg/L	0.00200		93.4	80-120			
Duplicate (BJI0347-DUP1)						Source: 21H0367-04 Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:12					
Mercury, Dissolved	0.000029	0.000013	0.000100	mg/L		0.000020			38.50	20	L, J
Matrix Spike (BJI0347-MS1)						Source: 21H0367-04 Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:14					
Mercury, Dissolved	0.000864	0.000013	0.000100	mg/L	0.00100	0.000020	84.5	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJI0347-MSD1)						Source: 21H0367-04 Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:17					
Mercury, Dissolved	0.000868	0.000013	0.000100	mg/L	0.00100	0.000020	84.9	75-125	0.46	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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Reported:
 29-Sep-2021 14:03

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0387 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0387-BLK1)						Prepared: 14-Sep-2021 Analyzed: 15-Sep-2021 20:21						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	6.63	20.0	ug/L							U
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U

LCS (BJI0387-BS1)						Prepared: 14-Sep-2021 Analyzed: 15-Sep-2021 20:25						
Barium, Dissolved	135	23.4	0.114	0.500	ug/L	25.0		93.6	80-120			
Barium, Dissolved	137	23.5	0.0765	0.500	ug/L	25.0		93.9	80-120			
Chromium, Dissolved	52	23.6	0.260	0.500	ug/L	25.0		94.5	80-120			
Chromium, Dissolved	53	24.0	0.239	0.500	ug/L	25.0		95.8	80-120			
Iron, Dissolved	54	5060	18.2	36.0	ug/L	5000		101	80-120			
Iron, Dissolved	57	4710	6.63	20.0	ug/L	5000		94.3	80-120			
Manganese, Dissolved	55	23.0	0.142	0.500	ug/L	25.0		91.9	80-120			
Silver, Dissolved	107	21.8	0.0220	0.200	ug/L	25.0		87.3	80-120			
Vanadium, Dissolved	51a	23.2	0.0556	0.200	ug/L	25.0		92.7	80-120			
Vanadium, Dissolved	51b	23.3	0.0521	0.200	ug/L	25.0		93.1	80-120			
Arsenic, Dissolved	75a	22.1	0.0373	0.200	ug/L	25.0		88.4	80-120			
Cadmium, Dissolved	111	22.5	0.0300	0.100	ug/L	25.0		90.1	80-120			


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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0387 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0387-BS1)						Prepared: 14-Sep-2021 Analyzed: 15-Sep-2021 20:25						
Cadmium, Dissolved	114	22.4	0.0400	0.100	ug/L	25.0		89.6	80-120			
Cobalt, Dissolved	59	22.7	0.0178	0.200	ug/L	25.0		90.7	80-120			
Copper, Dissolved	63	22.1	0.173	0.500	ug/L	25.0		88.2	80-120			
Copper, Dissolved	65	22.1	0.350	0.500	ug/L	25.0		88.3	80-120			
Nickel, Dissolved	60	22.6	0.0792	0.500	ug/L	25.0		90.6	80-120			
Nickel, Dissolved	62	23.2	0.220	0.500	ug/L	25.0		92.6	80-120			
Selenium, Dissolved	78	68.1	0.179	0.500	ug/L	80.0		85.1	80-120			
Zinc, Dissolved	66	67.3	2.92	6.00	ug/L	80.0		84.1	80-120			
Zinc, Dissolved	67	65.6	0.940	6.00	ug/L	80.0		82.0	80-120			
Duplicate (BJI0387-DUP1)						Source: 21H0367-08 Prepared: 14-Sep-2021 Analyzed: 15-Sep-2021 22:45						
Barium, Dissolved	135	0.166	0.114	0.500	ug/L		0.164			1.21	20	J
Chromium, Dissolved	52	ND	0.260	0.500	ug/L		ND					U
Iron, Dissolved	54	14400	18.2	36.0	ug/L		14400			0.23	20	
Silver, Dissolved	107	ND	0.0220	0.200	ug/L		ND					U
Vanadium, Dissolved	51a	0.189	0.0556	0.200	ug/L		0.203			7.14	20	J
Arsenic, Dissolved	75a	1.38	0.0373	0.200	ug/L		1.40			1.51	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L		ND					U
Cobalt, Dissolved	59	0.168	0.0178	0.200	ug/L		0.162			3.64	20	J
Copper, Dissolved	63	ND	0.173	0.500	ug/L		ND					U
Nickel, Dissolved	60	0.113	0.0792	0.500	ug/L		0.146			25.50	20	L, J
Selenium, Dissolved	78	ND	0.179	0.500	ug/L		ND					U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L		ND					U
Matrix Spike (BJI0387-MS1)						Source: 21H0367-08 Prepared: 14-Sep-2021 Analyzed: 15-Sep-2021 22:50						
Barium, Dissolved	135	25.6	0.114	0.500	ug/L	25.0	0.164	102	75-125			
Chromium, Dissolved	52	20.9	0.260	0.500	ug/L	25.0	ND	83.7	75-125			
Iron, Dissolved	54	18400	18.2	36.0	ug/L	5000	14400	80.6	75-125			
Silver, Dissolved	107	22.3	0.0220	0.200	ug/L	25.0	ND	89.1	75-125			
Vanadium, Dissolved	51a	20.9	0.0556	0.200	ug/L	25.0	0.203	82.9	75-125			
Arsenic, Dissolved	75a	24.6	0.0373	0.200	ug/L	25.0	1.40	92.9	75-125			
Cadmium, Dissolved	111	23.2	0.0300	0.100	ug/L	25.0	ND	92.7	75-125			
Cobalt, Dissolved	59	23.6	0.0178	0.200	ug/L	25.0	0.162	93.9	75-125			
Copper, Dissolved	63	23.0	0.173	0.500	ug/L	25.0	ND	92.1	75-125			
Nickel, Dissolved	60	23.3	0.0792	0.500	ug/L	25.0	0.146	92.6	75-125			


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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0387 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJI0387-MS1)		Source: 21H0367-08		Prepared: 14-Sep-2021		Analyzed: 15-Sep-2021 22:50						
Selenium, Dissolved	78	69.9	0.179	0.500	ug/L	80.0	ND	87.3	75-125			
Zinc, Dissolved	66	69.4	2.92	6.00	ug/L	80.0	ND	86.7	75-125			

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

Matrix Spike Dup (BJI0387-MSD1)		Source: 21H0367-08		Prepared: 14-Sep-2021		Analyzed: 15-Sep-2021 22:56						
Barium, Dissolved	135	26.0	0.114	0.500	ug/L	25.0	0.164	103	75-125	1.35	20	
Chromium, Dissolved	52	21.6	0.260	0.500	ug/L	25.0	ND	86.4	75-125	3.24	20	
Iron, Dissolved	54	18000	18.2	36.0	ug/L	5000	14400	72.6	75-125	2.21	20	*
Silver, Dissolved	107	22.7	0.0220	0.200	ug/L	25.0	ND	90.6	75-125	1.68	20	
Vanadium, Dissolved	51a	21.4	0.0556	0.200	ug/L	25.0	0.203	84.7	75-125	2.04	20	
Arsenic, Dissolved	75a	25.4	0.0373	0.200	ug/L	25.0	1.40	96.2	75-125	3.33	20	
Cadmium, Dissolved	111	23.6	0.0300	0.100	ug/L	25.0	ND	94.4	75-125	1.86	20	
Cobalt, Dissolved	59	24.4	0.0178	0.200	ug/L	25.0	0.162	96.8	75-125	3.08	20	
Copper, Dissolved	63	23.4	0.173	0.500	ug/L	25.0	ND	93.5	75-125	1.46	20	
Nickel, Dissolved	60	24.0	0.0792	0.500	ug/L	25.0	0.146	95.3	75-125	2.88	20	
Selenium, Dissolved	78	72.0	0.179	0.500	ug/L	80.0	ND	90.0	75-125	3.01	20	
Zinc, Dissolved	66	70.6	2.92	6.00	ug/L	80.0	ND	88.2	75-125	1.71	20	

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

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0387-BLK2)				Prepared: 14-Sep-2021		Analyzed: 16-Sep-2021 19:09						
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
LCS (BJI0387-BS2)				Prepared: 14-Sep-2021		Analyzed: 16-Sep-2021 19:14						
Lead, Dissolved	208	24.3	0.0513	0.100	ug/L	25.0		97.2	80-120			
Duplicate (BJI0387-DUP2)		Source: 21H0367-08		Prepared: 14-Sep-2021		Analyzed: 16-Sep-2021 19:40						
Lead, Dissolved	208	ND	0.0513	0.100	ug/L		ND					U
Duplicate (BJI0387-DUP3)		Source: 21H0367-08RE1		Prepared: 14-Sep-2021		Analyzed: 16-Sep-2021 21:54						
Manganese, Dissolved	55	529	0.710	2.50	ug/L		525			0.88	20	D
Matrix Spike (BJI0387-MS2)		Source: 21H0367-08		Prepared: 14-Sep-2021		Analyzed: 16-Sep-2021 19:45						



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Reported:
29-Sep-2021 14:03

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0387 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Matrix Spike (BJI0387-MS2) Source: 21H0367-08 Prepared: 14-Sep-2021 Analyzed: 16-Sep-2021 19:45

Lead, Dissolved	208	25.3	0.0513	0.100	ug/L	25.0	ND	101	75-125			
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJI0387-MS3) Source: 21H0367-08RE1 Prepared: 14-Sep-2021 Analyzed: 16-Sep-2021 21:58

Manganese, Dissolved	55	548	0.710	2.50	ug/L	25.0	525	94.7	75-125			HC, D
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJI0387-MSD2) Source: 21H0367-08 Prepared: 14-Sep-2021 Analyzed: 16-Sep-2021 19:51

Lead, Dissolved	208	27.7	0.0513	0.100	ug/L	25.0	ND	111	75-125	9.03	20	
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BJI0387-MSD3) Source: 21H0367-08RE1 Prepared: 14-Sep-2021 Analyzed: 16-Sep-2021 22:03

Manganese, Dissolved	55	529	0.710	2.50	ug/L	25.0	525	18.3	75-125	3.54	20	HC, D
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Reported:
29-Sep-2021 14:03

Wet Chemistry - Quality Control

Batch BJH0769 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJH0769-BLK1)						Prepared: 30-Aug-2021	Analyzed: 30-Aug-2021 17:31				
Sulfite	ND	1.4	1.4	mg/L							U
LCS (BJH0769-BS1)						Prepared: 30-Aug-2021	Analyzed: 30-Aug-2021 17:31				
Sulfite	5.5	1.4	1.4	mg/L	4.97		111	75-100			*
Duplicate (BJH0769-DUP1)						Source: 21H0367-07	Prepared: 30-Aug-2021	Analyzed: 30-Aug-2021 17:31			
Sulfite	ND	1.4	1.4	mg/L		ND					H, U



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Reported:
29-Sep-2021 14:03

Wet Chemistry - Quality Control

Batch BJH0771 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJH0771-BLK1)						Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 18:09					
Ferrous Iron	ND	0.040	0.040	mg/L							U
LCS (BJH0771-BS1)						Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 18:10					
Ferrous Iron	0.529	0.040	0.040	mg/L	0.500		106	90-110			
Duplicate (BJH0771-DUP1)						Source: 21H0367-07 Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 18:11					
Ferrous Iron	36.1	0.800	0.800	mg/L		35.8			0.67	20	D
Matrix Spike (BJH0771-MS2)						Source: 21H0367-07 Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 18:25					
Ferrous Iron	56.0	2.00	2.00	mg/L	20.0	35.8	101	75-125			D

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


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Reported:
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Wet Chemistry - Quality Control
Batch BJH0772 - No Prep Wet Chem

Instrument: IC930 Analyst: CDE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJH0772-BLK1) Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 20:03											
Chloride	ND	0.100	0.100	mg/L							U
Nitrate-N	ND	0.100	0.100	mg/L							U
Nitrite-N	ND	0.100	0.100	mg/L							U
Blank (BJH0772-BLK3) Prepared: 30-Aug-2021 Analyzed: 31-Aug-2021 20:07											
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BJH0772-BS1) Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 20:23											
Chloride	4.84	0.100	0.100	mg/L	5.00		96.7	90-110			
Nitrate-N	4.69	0.100	0.100	mg/L	5.00		93.8	90-110			
Nitrite-N	5.33	0.100	0.100	mg/L	5.00		107	90-110			
Sulfate	5.07	0.100	0.100	mg/L	5.00		101	90-110			
Duplicate (BJH0772-DUP1) Source: 21H0367-07 Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 21:03											
Chloride	3.94	0.100	0.100	mg/L		3.93			0.20	20	
Nitrate-N	ND	0.100	0.100	mg/L		ND					U
Nitrite-N	ND	0.100	0.100	mg/L		ND					U
Duplicate (BJH0772-DUP2) Source: 21H0367-07 Prepared: 30-Aug-2021 Analyzed: 31-Aug-2021 19:03											
Sulfate	0.135	0.100	0.100	mg/L		0.134			0.74	20	
Matrix Spike (BJH0772-MS1) Source: 21H0367-07 Prepared: 30-Aug-2021 Analyzed: 30-Aug-2021 21:23											
Chloride	5.94	0.100	0.100	mg/L	2.00	3.93	101	75-125			
Nitrate-N	1.81	0.100	0.100	mg/L	2.00	ND	90.5	75-125			
Nitrite-N	1.65	0.100	0.100	mg/L	2.01	ND	82.5	75-125			
Sulfate	1.94	0.100	0.100	mg/L	2.00	0.134	90.2	75-125			

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



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
29-Sep-2021 14:03

Certified Analyses included in this Report

Analyte	Certifications
EPA 300.0 in Water	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrate-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP



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Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE



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cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE



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1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE
Acenaphthene	ADEC,DoD-ELAP,NELAP,WADOE
Dibenzofuran	ADEC,DoD-ELAP,NELAP
Fluorene	ADEC,DoD-ELAP,NELAP,WADOE
Phenanthrene	ADEC,DoD-ELAP,NELAP,WADOE



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Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

EPA RSK-175 in Water

Methane	NELAP
Ethane	NELAP
Ethene	NELAP
Acetylene	NELAP

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE



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Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

SM 3500-Fe B-97 in Water

Ferrous Iron	WADOE,NELAP
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SM 4500-SO3 B-00 in Water

Sulfite	WADOE,NELAP
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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
H	Hold time violation - Hold time was exceeded.
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
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.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

30 September 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q3

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.

Associated Work Order(s)
21I0001

Associated SDG ID(s)
N/A

Shelly Fishel

Digitally signed by Shelly
Fishel
Date: 2021.09.30 16:54:49
-07'00'

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 enclose 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.

Shelly Fishel, Project Manager

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: 2110001		Turn-around Requested: Standard		Page: 1 of 1																																																																																																																																																																										
ARI Client Company: Shannon & Wilson, Inc		Phone:		Date: 8/31/21	Ice Present?																																																																																																																																																																									
Client Contact: Shoshanna Howard		No. of Coolers:		Cooler Temps: See CRF																																																																																																																																																																										
Client Project Name: LDW		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="12">Analysis Requested</th> <th>Notes/Comments</th> </tr> <tr> <th>TPH-G</th> <th>TPH-DX</th> <th>BTEX</th> <th>14VOCs</th> <th>MTBE</th> <th>PAHs</th> <th>Full List SVOCs</th> <th>170 SVOCs</th> <th>PCBs</th> <th>Total Metals Diss.</th> <th>Heavy Chrome</th> <th>Nat. Param.</th> <th></th> </tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td></td><td>X</td><td>X</td><td></td><td></td><td></td> </tr> <tr> <td></td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td>①</td><td></td><td></td><td></td> </tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td></td><td></td><td>X</td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td>X</td><td>X</td><td></td><td></td><td></td><td>X</td><td></td><td>X</td><td>X</td><td></td><td></td><td></td> </tr> <tr> <td></td><td>X</td><td>X</td><td></td><td></td><td></td><td>X</td><td></td><td>X</td><td>X</td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td>X</td><td>X</td><td></td><td></td><td></td> </tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td>X</td><td></td><td></td><td>X</td><td>X</td><td></td><td></td><td></td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>				Analysis Requested												Notes/Comments	TPH-G	TPH-DX	BTEX	14VOCs	MTBE	PAHs	Full List SVOCs	170 SVOCs	PCBs	Total Metals Diss.	Heavy Chrome	Nat. Param.			X	X	X		X			X	X					X	X							①					X	X	X		X				X						X	X	X										X	X				X		X	X					X	X				X		X	X						X	X	X	X			X	X					X	X	X		X			X	X																																										
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Client Project #: 21-1-12396-012		Samplers: KWP																																																																																																																																																																												

Sample ID	Date	Time	Matrix	No. Containers
MW-10R-20213108	8/31	9:00	GW	13
MW-9-20213108		10:00		9
MW-57-20213108		10:45		11
TB-11-20213108		11:00		5
MW-75-20213108		12:45		13
MW-101-20213108		13:00		13
MW-62-20213108		14:30		13
MW-62 MS/MSD-20213108		14:45		13

Comments/Special Instructions * LAB to filter for Dissolved Metals * Refer to Project Method and Analytes list	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Kirk Pinkston	Printed Name: Dmitri Lomchadze	Printed Name:	Printed Name:
	Company: Shannon & Wilson	Company: ARI	Company:	Company:
	Date & Time: 8/31/2021 16:08	Date & Time: 08/31/21 1608	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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

RE: LDW Q3 Receiving Documents 21I0001

Shoshana Howard <SKH@shanwil.com>

Wed 9/1/2021 4:10 PM

To: Shelly Fishel <shelly.fishel@arilabs.com>

Hi Shelly,

Looks good to me, except for the following:

MW-75 was logged for PAHs, but that was not marked on the COC (just full list SVOCs).

MW-75 and MW-101 were marked for TPH-Gx, but that was in error. They should have been marked for HVOCs instead of TPH-Gx. Can you revise?

Thanks!

Shoshana

Shoshana Howard, PE | Senior Engineer

400 N. 34th St., Suite 100

Seattle, WA 98103-8636

www.shannonwilson.com

Phone: (206) 632-8020 Fax: (206) 695-6777

Direct: (206) 695-6811 skh@shanwil.com

From: Shelly Fishel <shelly.fishel@arilabs.com>

Sent: Wednesday, September 1, 2021 2:44 PM

To: Shoshana Howard <SKH@shanwil.com>

Subject: LDW Q3 Receiving Documents 21I0001

Hello Shoshana,

ARI received six monitoring well samples with one trip blank and QC volume for one sample. The samples were logged under ARI work order number 21I0001. The samples were intact and within temperature compliance. Sample receiving made a number of errors in the login process. I think I have caught everything but please review for accuracy. Receiving documents are attached.

Be safe and stay healthy!

Regards,

Shelly Fishel



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-10R-20213108	21I0001-01	Water	31-Aug-2021 09:00	31-Aug-2021 16:08
MW-10R-20213108	21I0001-02	Water	31-Aug-2021 09:00	31-Aug-2021 16:08
MW-9-20213108	21I0001-03	Water	31-Aug-2021 10:00	31-Aug-2021 16:08
MW-9-20213108	21I0001-04	Water	31-Aug-2021 10:00	31-Aug-2021 16:08
MW-57-20213108	21I0001-05	Water	31-Aug-2021 10:45	31-Aug-2021 16:08
MW-57-20213108	21I0001-06	Water	31-Aug-2021 10:45	31-Aug-2021 16:08
TB-11-20213108	21I0001-07	Water	31-Aug-2021 11:00	31-Aug-2021 16:08
MW-75-20213108	21I0001-08	Water	31-Aug-2021 12:45	31-Aug-2021 16:08
MW-75-20213108	21I0001-09	Water	31-Aug-2021 12:45	31-Aug-2021 16:08
MW-101-20213108	21I0001-10	Water	31-Aug-2021 13:00	31-Aug-2021 16:08
MW-101-20213108	21I0001-11	Water	31-Aug-2021 13:00	31-Aug-2021 16:08
MW-62-20213108	21I0001-12	Water	31-Aug-2021 14:45	31-Aug-2021 16:08
MW-62-20213108	21I0001-13	Water	31-Aug-2021 14:45	31-Aug-2021 16:08



Shannon & Wilson, Inc
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q3
Work Order: 2110001

Sample receipt

Samples as listed on the preceding page were received 31-Aug-2021 16:08 under ARI work order 2110001. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 2110001-12 in batch BJI0156. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

No matrix QC was requested for the MS/MSD sample



Shannon & Wilson, Inc
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21I0001-12 in batch BJI0148. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21I0001-12 in batch BJI0218. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except 3,3'-Dichlorobenzidine which was out of control high in the initial calibration verification SJI0377-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier. 2,4-Dinitrophenol, 4,6-Dinitro-2-Methylphenol and Benzoic Acid were out of control low and



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

bis(2-ethylhexyl)Phthalate and Isophorone were out of control high in the second source calibration verification SJI0377-SCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Phenol-d5 which was out of control low in samples 21I0001-08 and 21I0001-10 as well as method blank BJI0074-BLK1 and have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits except 2,4-Dimethylphenol, Benzoic Acid, 4-Chloroaniline and Hexachlorocyclopentadiene which were out of control low and have been flagged.

Analysis not requested for MS/MSD sample so no matrix QC was performed.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Dibenzo(a,h)anthracene and surrogate Dibenzo(a,h)anthracene-d14 which were out of control high in the initial calibration verification SJI0424-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Dibenzo(a,h)anthracene-d14 which were out of control high in the initial calibration verification SJI0424-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0001-12 in batch BJI0154. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.



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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0001-12 in Total Metals batch BJI0423 and in association with sample 21I0001-13 in Dissolved Metals batch BJI0419. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0001-12 in Total Mercury batch BJI0293 and in association with sample 21I0001-13 in Dissolved Mercury batch BJI0349. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0001-12 in batch BJI0073. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

The analyst noted that samples 21I0001-05, 21I0001-08 and 21I0001-10 may contain a light Oil that eluted in the diesel range rather than Diesel.



WORK ORDER

21I0001

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH
21I0001-01 A	Glass NM, Amber, 1000 mL	
21I0001-01 B	Glass NM, Amber, 1000 mL	
21I0001-01 C	HDPE NM, 500 mL, 1:1 HNO3	✓2 Pass (P)
21I0001-01 D	Glass NM, Amber, 500 mL	
21I0001-01 E	Glass NM, Amber, 500 mL	
21I0001-01 F	Glass NM, Amber, 500 mL	
21I0001-01 G	Glass NM, Amber, 500 mL	
21I0001-01 H	VOA Vial, Clear, 40 mL, HCL	
21I0001-01 I	VOA Vial, Clear, 40 mL, HCL	
21I0001-01 J	VOA Vial, Clear, 40 mL, HCL	
21I0001-01 K	VOA Vial, Clear, 40 mL, HCL	
21I0001-01 L	VOA Vial, Clear, 40 mL, HCL	
21I0001-02 A	HDPE NM, 500 mL	
21I0001-03 A	HDPE NM, 500 mL, 1:1 HNO3	✓2 P
21I0001-03 B	Glass NM, Amber, 500 mL	
21I0001-03 C	Glass NM, Amber, 500 mL	
21I0001-03 D	VOA Vial, Clear, 40 mL, HCL	
21I0001-03 E	VOA Vial, Clear, 40 mL, HCL	
21I0001-03 F	VOA Vial, Clear, 40 mL, HCL	
21I0001-03 G	VOA Vial, Clear, 40 mL, HCL	
21I0001-03 H	VOA Vial, Clear, 40 mL, HCL	
21I0001-04 A	HDPE NM, 500 mL	
21I0001-05 A	HDPE NM, 500 mL, 1:1 HNO3	✓2 P
21I0001-05 B	Glass NM, Amber, 500 mL	
21I0001-05 C	Glass NM, Amber, 500 mL	
21I0001-05 D	Glass NM, Amber, 500 mL	
21I0001-05 E	Glass NM, Amber, 500 mL	
21I0001-05 F	VOA Vial, Clear, 40 mL, HCL	
21I0001-05 G	VOA Vial, Clear, 40 mL, HCL	
21I0001-05 H	VOA Vial, Clear, 40 mL, HCL	
21I0001-05 I	VOA Vial, Clear, 40 mL, HCL	
21I0001-05 J	VOA Vial, Clear, 40 mL, HCL	
21I0001-06 A	HDPE NM, 500 mL	
21I0001-07 A	VOA Vial, Clear, 40 mL, HCL	
21I0001-07 B	VOA Vial, Clear, 40 mL, HCL	



WORK ORDER

21I0001

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0001-07 C VOA Vial, Clear, 40 mL, HCL

21I0001-07 D VOA Vial, Clear, 40 mL, HCL

21I0001-07 E VOA Vial, Clear, 40 mL, HCL

21I0001-08 A Glass NM, Amber, 1000 mL

21I0001-08 B Glass NM, Amber, 1000 mL

21I0001-08 C HDPE NM, 500 mL, 1:1 HNO₃

L2 P

21I0001-08 D Glass NM, Amber, 500 mL

21I0001-08 E Glass NM, Amber, 500 mL

21I0001-08 F Glass NM, Amber, 500 mL

21I0001-08 G Glass NM, Amber, 500 mL

21I0001-08 H VOA Vial, Clear, 40 mL, HCL

21I0001-08 I VOA Vial, Clear, 40 mL, HCL

21I0001-08 J VOA Vial, Clear, 40 mL, HCL

21I0001-08 K VOA Vial, Clear, 40 mL, HCL

21I0001-08 L VOA Vial, Clear, 40 mL, HCL

21I0001-09 A HDPE NM, 500 mL

21I0001-10 A Glass NM, Amber, 1000 mL

21I0001-10 B Glass NM, Amber, 1000 mL

21I0001-10 C HDPE NM, 500 mL, 1:1 HNO₃

L2 P

21I0001-10 D Glass NM, Amber, 500 mL

21I0001-10 E Glass NM, Amber, 500 mL

21I0001-10 F Glass NM, Amber, 500 mL

21I0001-10 G Glass NM, Amber, 500 mL

21I0001-10 H VOA Vial, Clear, 40 mL, HCL

21I0001-10 I VOA Vial, Clear, 40 mL, HCL

21I0001-10 J VOA Vial, Clear, 40 mL, HCL

21I0001-10 K VOA Vial, Clear, 40 mL, HCL

21I0001-10 L VOA Vial, Clear, 40 mL, HCL

21I0001-11 A HDPE NM, 500 mL

21I0001-12 A Glass NM, Amber, 1000 mL

21I0001-12 B Glass NM, Amber, 1000 mL

21I0001-12 C Glass NM, Amber, 1000 mL

21I0001-12 D Glass NM, Amber, 1000 mL

21I0001-12 E HDPE NM, 500 mL, 1:1 HNO₃

L2 P

21I0001-12 F HDPE NM, 500 mL, 1:1 HNO₃

L2 P

21I0001-12 G Glass NM, Amber, 500 mL

21I0001-12 H Glass NM, Amber, 500 mL



WORK ORDER

21I0001

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0001-12 I Glass NM, Amber, 500 mL

21I0001-12 J Glass NM, Amber, 500 mL

21I0001-12 K Glass NM, Amber, 500 mL

21I0001-12 L Glass NM, Amber, 500 mL

21I0001-12 M Glass NM, Amber, 500 mL

21I0001-12 N Glass NM, Amber, 500 mL

21I0001-12 O VOA Vial, Clear, 40 mL, HCL

21I0001-12 P VOA Vial, Clear, 40 mL, HCL

21I0001-12 Q VOA Vial, Clear, 40 mL, HCL

21I0001-12 R VOA Vial, Clear, 40 mL, HCL

21I0001-12 S VOA Vial, Clear, 40 mL, HCL

21I0001-12 T VOA Vial, Clear, 40 mL, HCL

21I0001-12 U VOA Vial, Clear, 40 mL, HCL

21I0001-12 V VOA Vial, Clear, 40 mL, HCL

21I0001-12 W VOA Vial, Clear, 40 mL, HCL

21I0001-12 X VOA Vial, Clear, 40 mL, HCL

21I0001-13 A HDPE NM, 500 mL

21I0001-13 B HDPE NM, 500 mL

DL

Preservation Confirmed By

*09/01/21
O&K DL*

Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson Inc.

Project Name: LDW

COC No(s): _____ NA

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

Assigned ARI Job No: 2110001

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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 1608 5.7 28 5.6 4.1 3.9

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 5206

Cooler Accepted by: DL Date: 08/31/21 Time: 1608

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

How were bottles sealed in plastic bags? Individually Grouped Not

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

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: DL Date: 09/01/21 Time: 0941 Labels checked by: _____

**** 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: _____


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

MW-10R-20213108
21I0001-01 (Water)
Volatile Organic Compounds

 Method: EPA 8260D Sampled: 08/31/2021 09:00
 Instrument: NT2 Analyst: PKC Analyzed: 09/06/2021 18:30

 Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) Extract ID: 21I0001-01 L
 Preparation Batch: BJI0148 Sample Size: 10 mL
 Prepared: 09/06/2021 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	96.6	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108

21I0001-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 08/31/2021 09:00

Instrument: NT16 Analyst: PB

Analyzed: 09/07/2021 16:03

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-01 K

Preparation Batch: BJI0218

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	111	%	
Surrogate: Toluene-d8				80-120 %	98.1	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	92.9	%	


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

MW-10R-20213108
21I0001-01 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM Sampled: 08/31/2021 09:00
 Instrument: NT11 Analyst: VTS Analyzed: 09/28/2021 13:29

 Sample Preparation: Extract ID: 21I0001-01 F 01
 Preparation Method: EPA 3510C SepF
 Preparation Batch: BJI0154 Sample Size: 500 mL
 Prepared: 09/07/2021 Final Volume: 0.5 mL

 Sample Cleanup: Extract ID: 21I0001-01 F 01
 Cleanup Method: Silica Gel
 Cleanup Batch: CJI0198 Initial Volume: 0.5 mL
 Cleaned: 24-Sep-2021 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.003	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.001	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.002	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	62.0 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	74.1 %	Q
Surrogate: Fluoranthene-d10					57-120 %	69.8 %	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108

21I0001-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 08/31/2021 09:00

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 03:11

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-01 D 01

Preparation Batch: BJI0073

Sample Size: 500 mL

Prepared: 09/02/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	102	%	


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 Project Manager: Meg Strong

Reported:
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MW-10R-20213108
21I0001-01 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 08/31/2021 09:00
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 21:35
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0001-01 A 01
	Preparation Batch: BJI0156	Sample Size: 1000 mL	
	Prepared: 09/07/2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0001-01 A 01
	Cleanup Batch: CJI0204	Initial Volume: 0.5 mL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0001-01 A 01
	Cleanup Batch: CJI0202	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0001-01 A 01
	Cleanup Batch: CJI0203	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	68.4	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	62.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	69.5	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	59.7	%	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108

21I0001-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 09:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 23:54

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-01 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	5.84	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	538	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	1	0.142	0.500	176	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.858	ug/L	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108 21I0001-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 09:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:20

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-01 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	0.697	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.626	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.06	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	1.45	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108

21I0001-01 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 08/31/2021 09:00

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:14

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-01 C

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000040	mg/L	J



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108

21I0001-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 08/31/2021 09:00
Instrument: ICPMS1 Analyst: MCB	Analyzed: 09/15/2021 23:24
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJI0419
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21I0001-02 A 02
	Filtration Batch: BJI0036
	Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	5.53	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	18.4	ug/L	J
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	1	0.142	0.500	186	ug/L	
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	0.434	ug/L	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-10R-20213108

21I0001-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 09:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/15/2021 23:24

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-02 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.413	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.481	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.900	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	1.20	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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MW-10R-20213108

21I0001-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 08/31/2021 09:00

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 15:42

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-02 A 01

Preparation Batch: BJI0349

Sample Size: 20 mL

Filtration Batch: BJI0036

Prepared: 09/13/2021

Final Volume: 20 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000023	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D
Instrument: NT2 Analyst: PKC

Sampled: 08/31/2021 10:00

Analyzed: 09/06/2021 18:50

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) Extract ID: 21I0001-03 G
Preparation Batch: BJI0148 Sample Size: 10 mL
Prepared: 09/06/2021 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: Toluene-d8				80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	95.1	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-03 (Water)

Volatile Organic Compounds

Method: NWTPHg	Sampled: 08/31/2021 10:00
Instrument: NT2 Analyst: PKC	Analyzed: 09/06/2021 18:50
Sample Preparation:	Preparation Method: EPA 5030C (Purge and Trap)
	Preparation Batch: BJI0148
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 21I0001-03 G

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	95.1	%	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-03 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 08/31/2021 10:00

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 03:32

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-03 B 01

Preparation Batch: BJI0073

Sample Size: 500 mL

Prepared: 09/02/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>89.9</i>	<i>%</i>	



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Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 10:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 21:40

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-03 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese	7439-96-5	1	0.142	0.500	211	ug/L	



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Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 10:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 21:40

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0001-03 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	2.80	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	0.226	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.91	ug/L	



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Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 08/31/2021 10:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 21:44

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-04 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	1	0.142	0.500	182	ug/L	



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Reported:
30-Sep-2021 16:07

MW-9-20213108

21I0001-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 10:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 21:44

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0001-04 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.417	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	0.115	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	6.39	ug/L	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 08/31/2021 10:45

Instrument: NT2 Analyst: PKC

Analyzed: 09/06/2021 19:10

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-05 I

Preparation Batch: BJI0148

Sample Size: 10 mL

Prepared: 09/06/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.05	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	104	%	
Surrogate: Toluene-d8				80-120 %	98.9	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	95.1	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	98.4	%	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 08/31/2021 10:45

Instrument: NT16 Analyst: PB

Analyzed: 09/07/2021 16:24

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-05 J

Preparation Batch: BJI0218

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	6.40	ng/L	J
Surrogate: 1,2-Dichloroethane-d4				80-129 %	113	%	
Surrogate: Toluene-d8				80-120 %	96.9	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	93.4	%	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 08/31/2021 10:45

Analyzed: 09/28/2021 13:59

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0154
Prepared: 09/07/2021

Sample Size: 500 mL

Final Volume: 0.5 mL

Extract ID: 21I0001-05 D 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0198
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL

Final Volume: 0.5 mL

Extract ID: 21I0001-05 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.007	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.008	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.007	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.003	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	0.014	ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	74.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	88.6 %	Q
Surrogate: Fluoranthene-d10					57-120 %	88.5 %	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 08/31/2021 10:45

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 03:52

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-05 B 01

Preparation Batch: BJI0073

Sample Size: 500 mL

Prepared: 09/02/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.454	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	109	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 10:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 23:59

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0001-05 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	10.9	ug/L	
Chromium	7440-47-3	1	0.260	0.500	1.45	ug/L	
Iron	7439-89-6	1	18.2	36.0	23400	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.344	ug/L	
Silver	7440-22-4	1	0.0220	0.200	0.172	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	7.35	ug/L	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 10:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 23:59

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-05 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	8.87	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	4.29	ug/L	
Copper	7440-50-8	1	0.173	0.500	9.04	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	5.57	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-05 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 08/31/2021 10:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:16

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-05 A

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000047	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108
21I0001-05RE1 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 10:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 23:04

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-05RE1 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese	7439-96-5	10	1.42	5.00	1030	ug/L	D


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 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

MW-57-20213108
21I0001-06 (Water)
Metals and Metallic Compounds (dissolved)

 Method: EPA 6020B
 Instrument: ICPMS1 Analyst: MCB
 Sampled: 08/31/2021 10:45
 Analyzed: 09/15/2021 23:29

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJI0419 Sample Size: 25 mL
 Prepared: 09/15/2021 Final Volume: 25 mL
 Extract ID: 21I0001-06 A 02
 Filtration Batch: BJI0036
 Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	0.874	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.845	ug/L	
Iron, Dissolved	7439-89-6	1	18.2	36.0	18300	ug/L	
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	2.81	ug/L	

 Instrument: ICPMS2 Analyst: MCB
 Analyzed: 09/16/2021 22:58

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJI0419 Sample Size: 25 mL
 Prepared: 09/15/2021 Final Volume: 25 mL
 Extract ID: 21I0001-06 A 01
 Filtration Batch: BJI0036
 Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 10:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/15/2021 23:29

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0001-06 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	3.70	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	3.94	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	3.98	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.253	ug/L	J
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U

Instrument: ICPMS2 Analyst: MCB

Analyzed: 09/16/2021 22:58

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0001-06 A 01

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.200	ug/L	J



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108

21I0001-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 08/31/2021 10:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 15:45

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-06 A 01

Preparation Batch: BJI0349

Sample Size: 20 mL

Filtration Batch: BJI0036

Prepared: 09/13/2021

Final Volume: 20 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-57-20213108
21I0001-06RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B		Sampled: 08/31/2021 10:45
Instrument: ICPMS2 Analyst: MCB		Analyzed: 09/16/2021 23:06
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21I0001-06RE1 A 01
	Preparation Batch: BJI0419	Filtration Batch: BJI0036
	Prepared: 09/15/2021	Filtration Date: 09/01/2021 15:43
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	10	1.42	5.00	1040	ug/L	D



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

TB-11-20213108

21I0001-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 08/31/2021 11:00

Instrument: NT2 Analyst: PKC

Analyzed: 09/06/2021 13:35

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-07 D

Preparation Batch: BJI0148

Sample Size: 10 mL

Prepared: 09/06/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.14	0.50	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.4	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	96.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

TB-11-20213108

21I0001-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 08/31/2021 11:00

Instrument: NT16 Analyst: PB

Analyzed: 09/07/2021 16:44

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-07 E

Preparation Batch: BJI0218

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	112	%	
Surrogate: Toluene-d8				80-120 %	96.6	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	93.3	%	


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

MW-75-20213108
21I0001-08 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 08/31/2021 12:45

Instrument: NT2 Analyst: PKC

Analyzed: 09/06/2021 19:30

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-08 J

Preparation Batch: BJI0148

Sample Size: 10 mL

Prepared: 09/06/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	102	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	94.6	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	99.4	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Volatile Organic Compounds

Method: NWTPHg	Sampled: 08/31/2021 12:45
Instrument: NT2 Analyst: PKC	Analyzed: 09/06/2021 19:30
Sample Preparation:	Preparation Method: EPA 5030C (Purge and Trap)
	Preparation Batch: BJI0148
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 21I0001-08 J

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	100	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.6	%	



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Analytical Report

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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 08/31/2021 12:45

Instrument: NT16 Analyst: PB

Analyzed: 09/07/2021 17:05

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-08 K

Preparation Batch: BJI0218

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	60.1	ng/L	
Surrogate: 1,2-Dichloroethane-d4				80-129 %	112	%	
Surrogate: Toluene-d8				80-120 %	96.9	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	93.0	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 08/31/2021 12:45

Instrument: NT14 Analyst: VTS

Analyzed: 09/27/2021 20:16

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-08 A 01

Preparation Batch: BJI0074

Sample Size: 1000 mL

Prepared: 09/03/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.02	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.03	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	0.04	1.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.1	1.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	ND	ug/L	U
3-Nitroaniline	99-09-2	1	0.2	1.0	ND	ug/L	U


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Reported:
 30-Sep-2021 16:07

MW-75-20213108
21I0001-08 (Water)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 08/31/2021 12:45

Instrument: NT14 Analyst: VTS

Analyzed: 09/27/2021 20:16

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2,4-Dinitrophenol	51-28-5	1	0.2	2.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.06	0.2	0.1	ug/L	J
4-Nitroaniline	100-01-6	1	0.2	1.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	ND	ug/L	U
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.03	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.3	1.0	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.08	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.04	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>					30-160 %	40.8 %	
<i>Surrogate: Phenol-d5</i>					30-160 %	24.5 %	*
<i>Surrogate: 2-Chlorophenol-d4</i>					30-160 %	64.7 %	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					30-160 %	46.4 %	
<i>Surrogate: Nitrobenzene-d5</i>					30-160 %	68.7 %	
<i>Surrogate: 2-Fluorobiphenyl</i>					30-160 %	63.4 %	



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Analytical Report

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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 08/31/2021 12:45

Instrument: NT14 Analyst: VTS

Analyzed: 09/27/2021 20:16

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 2,4,6-Tribromophenol		30-160 %	75.0	%	
Surrogate: p-Terphenyl-d14		30-160 %	76.7	%	



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Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 08/31/2021 12:45

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 04:12

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-08 D 01

Preparation Batch: BJI0073

Sample Size: 500 mL

Prepared: 09/02/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.152	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	84.6	%	


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Reported:
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MW-75-20213108
21I0001-08 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 08/31/2021 12:45
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 21:55
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0001-08 B 01
	Preparation Batch: BJI0156	Sample Size: 1000 mL	
	Prepared: 09/07/2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0001-08 B 01
	Cleanup Batch: CJI0204	Initial Volume: 0.5 mL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0001-08 B 01
	Cleanup Batch: CJI0202	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0001-08 B 01
	Cleanup Batch: CJI0203	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	74.3	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	63.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	75.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	59.4	%	



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Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 12:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:04

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-08 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	8.25	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	2150	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	10	1.42	5.00	737	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.284	ug/L	



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Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 12:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:04

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-08 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	0.571	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	1.03	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.590	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	5.10	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-08 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 08/31/2021 12:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:19

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-08 C

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000043	mg/L	J



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B
Instrument: ICPMS1 Analyst: MCB

Sampled: 08/31/2021 12:45

Analyzed: 09/15/2021 23:33

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJI0419 Sample Size: 25 mL
Prepared: 09/15/2021 Final Volume: 25 mL

Extract ID: 21I0001-09 A 02

Filtration Batch: BJI0036

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	7.74	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	38.9	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	ND	ug/L	U

Instrument: ICPMS2 Analyst: MCB

Analyzed: 09/16/2021 23:11

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJI0419 Sample Size: 25 mL
Prepared: 09/15/2021 Final Volume: 25 mL

Extract ID: 21I0001-09 A 01

Filtration Batch: BJI0036

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	10	1.42	5.00	715	ug/L	D



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Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 12:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/15/2021 23:33

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-09 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.306	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.891	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.355	ug/L	J
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	4.75	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.370	ug/L	J
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Reported:
30-Sep-2021 16:07

MW-75-20213108

21I0001-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 08/31/2021 12:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 15:47

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-09 A 01

Preparation Batch: BJI0349

Sample Size: 20 mL

Filtration Batch: BJI0036

Prepared: 09/13/2021

Final Volume: 20 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000028	mg/L	J


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Reported:
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MW-101-20213108
21I0001-10 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 08/31/2021 13:00

Instrument: NT2 Analyst: PKC

Analyzed: 09/06/2021 19:51

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-10 K

Preparation Batch: BJI0148

Sample Size: 10 mL

Prepared: 09/06/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	108	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	98.1	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	96.1	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	100	%	



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Volatile Organic Compounds

Method: NWTPHg	Sampled: 08/31/2021 13:00
Instrument: NT2 Analyst: PKC	Analyzed: 09/06/2021 19:51
Sample Preparation:	Preparation Method: EPA 5030C (Purge and Trap)
	Preparation Batch: BJI0148
	Sample Size: 10 mL
	Prepared: 09/06/2021
	Final Volume: 10 mL
	Extract ID: 21I0001-10 K

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			80-120 %	98.1	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	96.1	%	



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 08/31/2021 13:00

Instrument: NT16 Analyst: PB

Analyzed: 09/07/2021 17:25

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-10 I

Preparation Batch: BJI0218

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	74.0	ng/L	
Surrogate: 1,2-Dichloroethane-d4				80-129 %	111	%	
Surrogate: Toluene-d8				80-120 %	97.6	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	92.5	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 08/31/2021 13:00

Instrument: NT14 Analyst: VTS

Analyzed: 09/27/2021 20:52

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-10 A 01

Preparation Batch: BJI0074

Sample Size: 1000 mL

Prepared: 09/03/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.02	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.03	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	0.04	1.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.1	1.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	ND	ug/L	U
3-Nitroaniline	99-09-2	1	0.2	1.0	ND	ug/L	U


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Reported:
 30-Sep-2021 16:07

MW-101-20213108
21I0001-10 (Water)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 08/31/2021 13:00

Instrument: NT14 Analyst: VTS

Analyzed: 09/27/2021 20:52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2,4-Dinitrophenol	51-28-5	1	0.2	2.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.06	0.2	0.07	ug/L	J
4-Nitroaniline	100-01-6	1	0.2	1.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	ND	ug/L	U
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.03	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.3	1.0	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.08	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.04	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>					30-160 %	48.9 %	
<i>Surrogate: Phenol-d5</i>					30-160 %	29.4 %	*
<i>Surrogate: 2-Chlorophenol-d4</i>					30-160 %	79.7 %	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					30-160 %	59.3 %	
<i>Surrogate: Nitrobenzene-d5</i>					30-160 %	84.0 %	
<i>Surrogate: 2-Fluorobiphenyl</i>					30-160 %	80.0 %	



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Analytical Report

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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-101-20213108
21I0001-10 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 08/31/2021 13:00

Instrument: NT14 Analyst: VTS

Analyzed: 09/27/2021 20:52

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 2,4,6-Tribromophenol		30-160 %	93.7	%	
Surrogate: p-Terphenyl-d14		30-160 %	95.7	%	



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 08/31/2021 13:00

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 04:32

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-10 D 01

Preparation Batch: BJI0073

Sample Size: 500 mL

Prepared: 09/02/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.142	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	99.4	%	


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Reported:
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MW-101-20213108
21I0001-10 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 08/31/2021 13:00
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 22:16
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0001-10 B 01
	Preparation Batch: BJI0156	Sample Size: 1000 mL	
	Prepared: 09/07/2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0001-10 B 01
	Cleanup Batch: CJI0204	Initial Volume: 0.5 mL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0001-10 B 01
	Cleanup Batch: CJI0202	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0001-10 B 01
	Cleanup Batch: CJI0203	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	76.9	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	65.7	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	79.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	62.2	%	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 13:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:08

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-10 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	8.93	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	6.63	36.0	5490	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.430	ug/L	



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 13:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:08

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-10 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	0.611	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	1.02	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.550	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	5.16	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-10 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 08/31/2021 13:00

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:21

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-10 C

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000040	mg/L	J



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Reported:
30-Sep-2021 16:07

MW-101-20213108
21I0001-10RE1 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 13:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 23:08

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-10RE1 C 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese	7439-96-5	10	1.42	5.00	719	ug/L	D



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 08/31/2021 13:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:13

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-11 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	7.26	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	43.6	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	ND	ug/L	U



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 13:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:13

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-11 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.351	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.967	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.334	ug/L	J
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	4.84	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 08/31/2021 13:00

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 15:49

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-11 A 01

Preparation Batch: BJI0349

Sample Size: 20 mL

Filtration Batch: BJI0036

Prepared: 09/13/2021

Final Volume: 20 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000027	mg/L	J



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Reported:
30-Sep-2021 16:07

MW-101-20213108

21I0001-11RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 08/31/2021 13:00

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 23:13

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-11RE1 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	10	1.42	5.00	688	ug/L	D



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-12 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 08/31/2021 14:45

Instrument: NT2 Analyst: PKC

Analyzed: 09/06/2021 20:11

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-12 S

Preparation Batch: BJI0148

Sample Size: 10 mL

Prepared: 09/06/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	104	%	
Surrogate: Toluene-d8				80-120 %	98.2	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	94.5	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	102	%	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-12 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 08/31/2021 14:45

Instrument: NT16 Analyst: PB

Analyzed: 09/07/2021 17:46

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0001-12 P

Preparation Batch: BJI0218

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	5.25	ng/L	J
Surrogate: 1,2-Dichloroethane-d4				80-129 %	110	%	
Surrogate: Toluene-d8				80-120 %	97.9	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	92.5	%	


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Reported:
 30-Sep-2021 16:07

MW-62-20213108
21I0001-12 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM Sampled: 08/31/2021 14:45
 Instrument: NT11 Analyst: VTS Analyzed: 09/28/2021 14:29

 Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21I0001-12 J 01
Preparation Batch: BJI0154 Sample Size: 500 mL
Prepared: 09/07/2021 Final Volume: 0.5 mL

 Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 21I0001-12 J 01
Cleanup Batch: CJI0198 Initial Volume: 0.5 mL
Cleaned: 24-Sep-2021 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.006	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.003	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.001	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.001	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	0.022	ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	77.3 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	98.7 %	Q
Surrogate: Fluoranthene-d10					57-120 %	88.8 %	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-12 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 08/31/2021 14:45

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 04:52

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0001-12 G 01

Preparation Batch: BJI0073

Sample Size: 500 mL

Prepared: 09/02/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>119</i>	<i>%</i>	


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Reported:
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MW-62-20213108
21I0001-12 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 08/31/2021 14:45
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 22:36
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0001-12 A 01
	Preparation Batch: BJI0156	Sample Size: 1000 mL	
	Prepared: 09/07/2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0001-12 A 01
	Cleanup Batch: CJI0204	Initial Volume: 0.5 mL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0001-12 A 01
	Cleanup Batch: CJI0202	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0001-12 A 01
	Cleanup Batch: CJI0203	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	74.2	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	61.7	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	74.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	59.0	%	



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-12 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 08/31/2021 14:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:18

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-12 F 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	13.1	ug/L	
Chromium	7440-47-3	1	0.260	0.500	0.810	ug/L	
Iron	7439-89-6	1	18.2	36.0	1020	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.405	ug/L	
Manganese	7439-96-5	1	0.142	0.500	222	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	4.08	ug/L	



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Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-12 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 14:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:18

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-12 F 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.10	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	5.12	ug/L	
Copper	7440-50-8	1	0.173	0.500	3.45	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	6.27	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	3.38	ug/L	J



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Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-12 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 08/31/2021 14:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 13:46

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-12 F

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000038	mg/L	J



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B
Instrument: ICPMS1 Analyst: MCB

Sampled: 08/31/2021 14:45

Analyzed: 09/15/2021 23:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJI0419 Sample Size: 25 mL
Prepared: 09/15/2021 Final Volume: 25 mL

Extract ID: 21I0001-13 B 02

Filtration Batch: BJI0036

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	10.1	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	49.5	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	1.47	ug/L	

Instrument: ICPMS2 Analyst: MCB

Analyzed: 09/16/2021 23:16

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJI0419 Sample Size: 25 mL
Prepared: 09/15/2021 Final Volume: 25 mL

Extract ID: 21I0001-13 B 01

Filtration Batch: BJI0036

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	5	0.710	2.50	277	ug/L	D



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 08/31/2021 14:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/15/2021 23:38

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0001-13 B 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.385	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	4.59	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	1.59	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	4.90	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

MW-62-20213108

21I0001-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 08/31/2021 14:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 15:33

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0001-13 B 01

Preparation Batch: BJI0349

Sample Size: 20 mL

Filtration Batch: BJI0036

Prepared: 09/13/2021

Final Volume: 20 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000027	mg/L	J


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Reported:
 30-Sep-2021 16:07

Volatile Organic Compounds - Quality Control
Batch BJI0148 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0148-BLK1)										
					Prepared: 06-Sep-2021		Analyzed: 06-Sep-2021 12:32			
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	4.91		ug/L	5.00		98.1	80-120			
Surrogate: 4-Bromofluorobenzene	4.84		ug/L	5.00		96.9	80-120			
Blank (BJI0148-BLK2)										
					Prepared: 06-Sep-2021		Analyzed: 06-Sep-2021 12:32			
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Methyl tert-butyl Ether	ND	0.14	0.50	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	5.19		ug/L	5.00		104	80-129			
Surrogate: Toluene-d8	4.91		ug/L	5.00		98.1	80-120			
Surrogate: 4-Bromofluorobenzene	4.84		ug/L	5.00		96.9	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.06		ug/L	5.00		101	80-120			
LCS (BJI0148-BS1)										
					Prepared: 06-Sep-2021		Analyzed: 06-Sep-2021 10:50			
Gasoline Range Organics (Tol-Nap)	1010	100	ug/L	1000		101	72-128			
Surrogate: Toluene-d8	5.03		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	4.86		ug/L	5.00		97.2	80-120			
LCS (BJI0148-BS2)										
					Prepared: 06-Sep-2021		Analyzed: 06-Sep-2021 11:10			
Vinyl Chloride	10.5	0.08	0.20	ug/L	10.0	105	66-133			
1,1-Dichloroethene	10.7	0.08	0.20	ug/L	10.0	107	69-135			
trans-1,2-Dichloroethene	10.1	0.07	0.20	ug/L	10.0	101	78-128			
cis-1,2-Dichloroethene	10.5	0.08	0.20	ug/L	10.0	105	80-121			
Benzene	10.2	0.05	0.20	ug/L	10.0	102	80-120			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Volatile Organic Compounds - Quality Control
Batch BJI0148 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0148-BS2)						Prepared: 06-Sep-2021 Analyzed: 06-Sep-2021 11:10					
Trichloroethene	9.99	0.07	0.20	ug/L	10.0		99.9	80-120			
Toluene	9.91	0.05	0.20	ug/L	10.0		99.1	80-120			
Tetrachloroethene	9.99	0.09	0.20	ug/L	10.0		99.9	80-120			
Ethylbenzene	10.0	0.05	0.20	ug/L	10.0		100	80-120			
m,p-Xylene	20.3	0.14	0.40	ug/L	20.0		101	80-121			
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Xylenes, total	30.4	0.22	0.60	ug/L	30.0		101	76-127			
Methyl tert-butyl Ether	10.5	0.14	0.50	ug/L	10.0		105	71-132			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.25			ug/L	5.00		105	80-129			
<i>Surrogate: Toluene-d8</i>	5.06			ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.02			ug/L	5.00		100	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.02			ug/L	5.00		100	80-120			
LCS Dup (BJI0148-BSD1)						Prepared: 06-Sep-2021 Analyzed: 06-Sep-2021 11:31					
Gasoline Range Organics (Tol-Nap)	931		100	ug/L	1000		93.1	72-128	8.36	30	
<i>Surrogate: Toluene-d8</i>	4.99			ug/L	5.00		99.8	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.84			ug/L	5.00		96.9	80-120			
LCS Dup (BJI0148-BSD2)						Prepared: 06-Sep-2021 Analyzed: 06-Sep-2021 11:51					
Vinyl Chloride	10.2	0.08	0.20	ug/L	10.0		102	66-133	2.68	30	
1,1-Dichloroethene	10.4	0.08	0.20	ug/L	10.0		104	69-135	2.86	30	
trans-1,2-Dichloroethene	9.72	0.07	0.20	ug/L	10.0		97.2	78-128	4.28	30	
cis-1,2-Dichloroethene	10.0	0.08	0.20	ug/L	10.0		100	80-121	4.20	30	
Benzene	10.2	0.05	0.20	ug/L	10.0		102	80-120	0.20	30	
Trichloroethene	10.3	0.07	0.20	ug/L	10.0		103	80-120	3.14	30	
Toluene	9.87	0.05	0.20	ug/L	10.0		98.7	80-120	0.37	30	
Tetrachloroethene	10.0	0.09	0.20	ug/L	10.0		100	80-120	0.18	30	
Ethylbenzene	9.84	0.05	0.20	ug/L	10.0		98.4	80-120	1.86	30	
m,p-Xylene	20.1	0.14	0.40	ug/L	20.0		101	80-121	0.71	30	
o-Xylene	9.96	0.08	0.20	ug/L	10.0		99.6	80-121	1.36	30	
Xylenes, total	30.1	0.22	0.60	ug/L	30.0		100	76-127	0.93	30	
Methyl tert-butyl Ether	10.2	0.14	0.50	ug/L	10.0		102	71-132	2.55	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.26			ug/L	5.00		105	80-129			
<i>Surrogate: Toluene-d8</i>	5.04			ug/L	5.00		101	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Volatile Organic Compounds - Quality Control
Batch BJI0148 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJI0148-BSD2)					Prepared: 06-Sep-2021 Analyzed: 06-Sep-2021 11:51						
Surrogate: 4-Bromofluorobenzene	5.15			ug/L	5.00		103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.05			ug/L	5.00		101	80-120			
Matrix Spike (BJI0148-MS1)					Source: 21I0001-12 Prepared: 06-Sep-2021 Analyzed: 06-Sep-2021 20:52						
Vinyl Chloride	10.8	0.08	0.20	ug/L	10.0	ND	108	66-133			
1,1-Dichloroethene	11.2	0.08	0.20	ug/L	10.0	ND	112	69-135			
trans-1,2-Dichloroethene	10.4	0.07	0.20	ug/L	10.0	ND	104	78-128			
cis-1,2-Dichloroethene	10.8	0.08	0.20	ug/L	10.0	ND	108	80-121			
Benzene	10.8	0.05	0.20	ug/L	10.0	ND	108	80-120			
Trichloroethene	10.7	0.07	0.20	ug/L	10.0	ND	107	80-120			
Toluene	10.5	0.05	0.20	ug/L	10.0	ND	105	80-120			
Tetrachloroethene	10.6	0.09	0.20	ug/L	10.0	ND	106	80-120			
Ethylbenzene	10.5	0.05	0.20	ug/L	10.0	ND	105	80-120			
m,p-Xylene	21.2	0.14	0.40	ug/L	20.0	ND	106	80-121			
o-Xylene	10.5	0.08	0.20	ug/L	10.0	ND	105	80-121			
Xylenes, total	31.8	0.22	0.60	ug/L	30.0	ND	106	76-127			
Methyl tert-butyl Ether	10.6	0.14	0.50	ug/L	10.0	ND	106	71-132			
Surrogate: 1,2-Dichloroethane-d4	5.49			ug/L	5.00	5.22	110	80-129			
Surrogate: Toluene-d8	5.11			ug/L	5.00	4.91	102	80-120			
Surrogate: 4-Bromofluorobenzene	5.13			ug/L	5.00	4.72	103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.06			ug/L	5.00	5.08	101	80-120			

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

Matrix Spike Dup (BJI0148-MSD1)					Source: 21I0001-12 Prepared: 06-Sep-2021 Analyzed: 06-Sep-2021 21:12						
Vinyl Chloride	10.8	0.08	0.20	ug/L	10.0	ND	108	66-133	0.50	30	
1,1-Dichloroethene	10.9	0.08	0.20	ug/L	10.0	ND	109	69-135	2.02	30	
trans-1,2-Dichloroethene	10.2	0.07	0.20	ug/L	10.0	ND	102	78-128	2.09	30	
cis-1,2-Dichloroethene	10.7	0.08	0.20	ug/L	10.0	ND	107	80-121	0.83	30	
Benzene	10.6	0.05	0.20	ug/L	10.0	ND	106	80-120	2.39	30	
Trichloroethene	10.6	0.07	0.20	ug/L	10.0	ND	106	80-120	0.91	30	
Toluene	10.3	0.05	0.20	ug/L	10.0	ND	103	80-120	2.59	30	
Tetrachloroethene	10.4	0.09	0.20	ug/L	10.0	ND	104	80-120	1.86	30	
Ethylbenzene	10.2	0.05	0.20	ug/L	10.0	ND	102	80-120	3.04	30	
m,p-Xylene	20.5	0.14	0.40	ug/L	20.0	ND	103	80-121	3.27	30	
o-Xylene	10.2	0.08	0.20	ug/L	10.0	ND	102	80-121	2.98	30	



Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Volatile Organic Compounds - Quality Control

Batch BJI0148 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJI0148-MSD1)		Source: 21I0001-12		Prepared: 06-Sep-2021		Analyzed: 06-Sep-2021 21:12					
Xylenes, total	30.8	0.22	0.60	ug/L	30.0	ND	103	76-127	3.17	30	
Methyl tert-butyl Ether	10.8	0.14	0.50	ug/L	10.0	ND	108	71-132	1.77	30	
Surrogate: 1,2-Dichloroethane-d4	5.47			ug/L	5.00	5.22	109	80-129			
Surrogate: Toluene-d8	5.04			ug/L	5.00	4.91	101	80-120			
Surrogate: 4-Bromofluorobenzene	5.03			ug/L	5.00	4.72	101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.89			ug/L	5.00	5.08	97.8	80-120			

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


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Volatile Organic Compounds - SIM - Quality Control
Batch BJI0218 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0218-BLK1)						Prepared: 07-Sep-2021 Analyzed: 07-Sep-2021 14:10					
Vinyl chloride	ND	5.01	20.0	ng/L							U
Surrogate: 1,2-Dichloroethane-d4	5620			ng/L	5000		112	80-129			
Surrogate: Toluene-d8	4970			ng/L	5000		99.5	80-120			
Surrogate: 4-Bromofluorobenzene	4740			ng/L	5000		94.8	75-125			
LCS (BJI0218-BS1)						Prepared: 07-Sep-2021 Analyzed: 07-Sep-2021 13:30					
Vinyl chloride	2300	5.01	20.0	ng/L	2000		115	62-141			
Surrogate: 1,2-Dichloroethane-d4	5360			ng/L	5000		107	80-129			
Surrogate: Toluene-d8	5140			ng/L	5000		103	80-120			
Surrogate: 4-Bromofluorobenzene	4960			ng/L	5000		99.3	75-125			
LCS Dup (BJI0218-BSD1)						Prepared: 07-Sep-2021 Analyzed: 07-Sep-2021 13:50					
Vinyl chloride	1930	5.01	20.0	ng/L	2000		96.5	62-141	17.40	30	
Surrogate: 1,2-Dichloroethane-d4	5300			ng/L	5000		106	80-129			
Surrogate: Toluene-d8	5060			ng/L	5000		101	80-120			
Surrogate: 4-Bromofluorobenzene	5040			ng/L	5000		101	75-125			
Matrix Spike (BJI0218-MS1)						Source: 21I0001-12 Prepared: 07-Sep-2021 Analyzed: 07-Sep-2021 18:06					
Vinyl chloride	1960	5.01	20.0	ng/L	2000	5.25	97.9	62-141			
Surrogate: 1,2-Dichloroethane-d4	5450			ng/L	5000	5500	109	80-129			
Surrogate: Toluene-d8	4800			ng/L	5000	4900	95.9	80-120			
Surrogate: 4-Bromofluorobenzene	4930			ng/L	5000	4620	98.6	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJI0218-MSD1)						Source: 21I0001-12 Prepared: 07-Sep-2021 Analyzed: 07-Sep-2021 18:27					
Vinyl chloride	1880	5.01	20.0	ng/L	2000	5.25	93.6	62-141	4.46	30	
Surrogate: 1,2-Dichloroethane-d4	5490			ng/L	5000	5500	110	80-129			
Surrogate: Toluene-d8	4790			ng/L	5000	4900	95.9	80-120			
Surrogate: 4-Bromofluorobenzene	4980			ng/L	5000	4620	99.5	75-125			

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



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Semivolatile Organic Compounds - Quality Control

Batch BJI0074 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0074-BLK1)						Prepared: 03-Sep-2021 Analyzed: 27-Sep-2021 16:38					
Phenol	ND	0.01	0.2	ug/L							U
bis(2-chloroethyl) ether	ND	0.03	0.2	ug/L							U
2-Chlorophenol	ND	0.03	0.2	ug/L							U
1,3-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
Benzyl Alcohol	ND	0.02	0.2	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.03	0.2	ug/L							U
2-Methylphenol	ND	0.03	0.2	ug/L							U
Hexachloroethane	ND	0.04	0.2	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.04	0.2	ug/L							U
4-Methylphenol	ND	0.03	0.2	ug/L							U
Nitrobenzene	ND	0.03	0.2	ug/L							U
Isophorone	ND	0.03	0.2	ug/L							U
2-Nitrophenol	ND	0.04	1.0	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.03	0.2	ug/L							U
2,4-Dichlorophenol	ND	0.1	1.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.03	0.2	ug/L							U
Naphthalene	ND	0.03	0.2	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
4-Chloroaniline	ND	0.04	1.0	ug/L							U
Hexachlorobutadiene	ND	0.04	0.2	ug/L							U
4-Chloro-3-Methylphenol	ND	0.1	1.0	ug/L							U
2-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Hexachlorocyclopentadiene	ND	0.1	1.0	ug/L							U
2,4,6-Trichlorophenol	ND	0.2	1.0	ug/L							U
2,4,5-Trichlorophenol	ND	0.1	1.0	ug/L							U
2-Chloronaphthalene	ND	0.03	0.2	ug/L							U
2-Nitroaniline	ND	0.2	1.0	ug/L							U
Acenaphthylene	ND	0.02	0.2	ug/L							U
Dimethylphthalate	ND	0.04	0.2	ug/L							U
2,6-Dinitrotoluene	ND	0.2	1.0	ug/L							U
Acenaphthene	ND	0.03	0.2	ug/L							U
3-Nitroaniline	ND	0.2	1.0	ug/L							U



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Semivolatile Organic Compounds - Quality Control

Batch BJI0074 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0074-BLK1)						Prepared: 03-Sep-2021 Analyzed: 27-Sep-2021 16:38					
2,4-Dinitrophenol	ND	0.2	2.0	ug/L							U
Dibenzofuran	ND	0.02	0.2	ug/L							U
4-Nitrophenol	ND	0.06	1.0	ug/L							U
2,4-Dinitrotoluene	ND	0.1	1.0	ug/L							U
Fluorene	ND	0.02	0.2	ug/L							U
4-Chlorophenylphenyl ether	ND	0.02	0.2	ug/L							U
Diethyl phthalate	ND	0.06	0.2	ug/L							U
4-Nitroaniline	ND	0.2	1.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	0.4	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
4-Bromophenyl phenyl ether	ND	0.02	0.2	ug/L							U
Hexachlorobenzene	ND	0.04	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Phenanthrene	ND	0.02	0.2	ug/L							U
Anthracene	ND	0.03	0.2	ug/L							U
Carbazole	ND	0.04	0.2	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Fluoranthene	ND	0.03	0.2	ug/L							U
Pyrene	ND	0.03	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
Benzo(a)anthracene	ND	0.04	0.2	ug/L							U
3,3'-Dichlorobenzidine	ND	0.3	1.0	ug/L							U
Chrysene	ND	0.04	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
Di-n-Octylphthalate	ND	0.05	0.2	ug/L							U
Benzo(a)fluoranthene, Total	ND	0.08	0.4	ug/L							U
Benzo(a)pyrene	ND	0.05	0.2	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.06	0.2	ug/L							U
Dibenzo(a,h)anthracene	ND	0.07	0.2	ug/L							U
Benzo(g,h,i)perylene	ND	0.04	0.2	ug/L							U
1-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Surrogate: 2-Fluorophenol	3.68			ug/L	7.50		49.1	30-160			
Surrogate: Phenol-d5	2.11			ug/L	7.50		28.2	30-160			*
Surrogate: 2-Chlorophenol-d4	5.41			ug/L	7.50		72.2	30-160			


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Semivolatile Organic Compounds - Quality Control
Batch BJI0074 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0074-BLK1)						Prepared: 03-Sep-2021	Analyzed: 27-Sep-2021 16:38				
Surrogate: 1,2-Dichlorobenzene-d4	1.79			ug/L	5.00		35.7	30-160			
Surrogate: Nitrobenzene-d5	3.73			ug/L	5.00		74.6	30-160			
Surrogate: 2-Fluorobiphenyl	2.77			ug/L	5.00		55.3	30-160			
Surrogate: 2,4,6-Tribromophenol	5.25			ug/L	7.50		70.1	30-160			
Surrogate: p-Terphenyl-d14	4.27			ug/L	5.00		85.4	30-160			
LCS (BJI0074-BS1)						Prepared: 03-Sep-2021	Analyzed: 27-Sep-2021 17:14				
Phenol	1.6	0.01	0.2	ug/L	5.00		32.1	30-160			
bis(2-chloroethyl) ether	4.1	0.03	0.2	ug/L	5.00		82.0	30-160			
2-Chlorophenol	3.5	0.03	0.2	ug/L	5.00		70.1	30-160			
1,3-Dichlorobenzene	2.4	0.03	0.2	ug/L	5.00		47.7	30-160			
1,4-Dichlorobenzene	2.8	0.03	0.2	ug/L	5.00		55.2	30-160			
1,2-Dichlorobenzene	2.6	0.03	0.2	ug/L	5.00		52.6	30-160			
Benzyl Alcohol	2.7	0.02	0.2	ug/L	5.00		53.2	30-160			
2,2'-Oxybis(1-chloropropane)	4.2	0.03	0.2	ug/L	5.00		84.5	30-160			
2-Methylphenol	2.6	0.03	0.2	ug/L	5.00		51.5	30-160			
Hexachloroethane	2.3	0.04	0.2	ug/L	5.00		46.5	30-160			
N-Nitroso-di-n-Propylamine	2.5	0.04	0.2	ug/L	5.00		50.2	30-160			
4-Methylphenol	2.7	0.03	0.2	ug/L	5.00		53.4	30-160			
Nitrobenzene	4.0	0.03	0.2	ug/L	5.00		79.9	30-160			
Isophorone	5.9	0.03	0.2	ug/L	5.00		118	30-160			
2-Nitrophenol	3.9	0.04	1.0	ug/L	5.00		78.6	30-160			
2,4-Dimethylphenol	2.3	0.3	1.0	ug/L	13.0		17.4	30-160			*
Bis(2-Chloroethoxy)methane	4.5	0.03	0.2	ug/L	5.00		89.9	30-160			
2,4-Dichlorophenol	11.9	0.1	1.0	ug/L	13.0		91.5	30-160			
1,2,4-Trichlorobenzene	2.6	0.03	0.2	ug/L	5.00		51.1	30-160			
Naphthalene	3.1	0.03	0.2	ug/L	5.00		62.9	30-160			
Benzoic acid	6.8	0.1	2.0	ug/L	23.0		29.5	30-160			*
4-Chloroaniline	2.3	0.04	1.0	ug/L	13.0		17.5	30-160			*
Hexachlorobutadiene	2.0	0.04	0.2	ug/L	5.00		40.3	30-160			
4-Chloro-3-Methylphenol	10.6	0.1	1.0	ug/L	13.0		81.4	30-160			
2-Methylnaphthalene	3.3	0.03	0.2	ug/L	5.00		65.5	30-160			
Hexachlorocyclopentadiene	2.5	0.1	1.0	ug/L	13.0		19.2	30-160			*
2,4,6-Trichlorophenol	11.1	0.2	1.0	ug/L	13.0		85.2	30-160			
2,4,5-Trichlorophenol	11.4	0.1	1.0	ug/L	13.0		87.6	30-160			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Semivolatile Organic Compounds - Quality Control

Batch BJI0074 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0074-BS1)					Prepared: 03-Sep-2021		Analyzed: 27-Sep-2021 17:14				
2-Chloronaphthalene	3.5	0.03	0.2	ug/L	5.00		70.7	30-160			
2-Nitroaniline	12.8	0.2	1.0	ug/L	13.0		98.1	30-160			
Acenaphthylene	3.5	0.02	0.2	ug/L	5.00		69.7	30-160			
Dimethylphthalate	4.3	0.04	0.2	ug/L	5.00		86.1	30-160			
2,6-Dinitrotoluene	13.6	0.2	1.0	ug/L	13.0		104	30-160			
Acenaphthene	3.6	0.03	0.2	ug/L	5.00		71.6	30-160			
3-Nitroaniline	11.8	0.2	1.0	ug/L	13.0		90.9	30-160			
2,4-Dinitrophenol	18.1	0.2	2.0	ug/L	23.0		78.8	30-160			
Dibenzofuran	3.9	0.02	0.2	ug/L	5.00		78.6	30-160			
4-Nitrophenol	4.5	0.06	1.0	ug/L	13.0		34.4	30-160			
2,4-Dinitrotoluene	12.6	0.1	1.0	ug/L	13.0		96.9	30-160			
Fluorene	3.5	0.02	0.2	ug/L	5.00		70.4	30-160			
4-Chlorophenylphenyl ether	3.8	0.02	0.2	ug/L	5.00		76.4	30-160			
Diethyl phthalate	4.8	0.06	0.2	ug/L	5.00		95.4	30-160			
4-Nitroaniline	12.1	0.2	1.0	ug/L	13.0		93.4	30-160			
4,6-Dinitro-2-methylphenol	19.6	0.4	2.0	ug/L	23.0		85.1	30-160			
N-Nitrosodiphenylamine	3.5	0.03	0.2	ug/L	5.00		69.8	30-160			
4-Bromophenyl phenyl ether	4.3	0.02	0.2	ug/L	5.00		86.0	30-160			
Hexachlorobenzene	4.0	0.04	0.2	ug/L	5.00		80.7	30-160			
Pentachlorophenol	10.6	0.1	1.0	ug/L	13.0		81.2	30-160			
Phenanthrene	4.0	0.02	0.2	ug/L	5.00		80.7	30-160			
Anthracene	3.8	0.03	0.2	ug/L	5.00		75.8	30-160			
Carbazole	4.7	0.04	0.2	ug/L	5.00		94.8	30-160			
Di-n-Butylphthalate	5.0	0.05	0.2	ug/L	5.00		99.6	30-160			
Fluoranthene	4.2	0.03	0.2	ug/L	5.00		83.9	30-160			
Pyrene	4.1	0.03	0.2	ug/L	5.00		82.1	30-160			
Butylbenzylphthalate	4.3	0.07	0.2	ug/L	5.00		86.3	30-160			
Benzo(a)anthracene	4.1	0.04	0.2	ug/L	5.00		81.6	30-160			
3,3'-Dichlorobenzidine	12.7	0.3	1.0	ug/L	13.0		97.8	30-160			Q
Chrysene	4.0	0.04	0.2	ug/L	5.00		80.7	30-160			
bis(2-Ethylhexyl)phthalate	4.6	0.2	0.2	ug/L	5.00		92.4	30-160			
Di-n-Octylphthalate	4.1	0.05	0.2	ug/L	5.00		82.8	30-160			
Benzo(a)fluoranthene, Total	8.5	0.08	0.4	ug/L	10.0		84.6	30-160			
Benzo(a)pyrene	3.9	0.05	0.2	ug/L	5.00		78.4	30-160			
Indeno(1,2,3-cd)pyrene	4.6	0.06	0.2	ug/L	5.00		91.8	30-160			



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Semivolatile Organic Compounds - Quality Control

Batch BJI0074 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0074-BS1)					Prepared: 03-Sep-2021 Analyzed: 27-Sep-2021 17:14						
Dibenzo(a,h)anthracene	4.7	0.07	0.2	ug/L	5.00		94.2	30-160			
Benzo(g,h,i)perylene	4.5	0.04	0.2	ug/L	5.00		90.5	30-160			
1-Methylnaphthalene	3.6	0.03	0.2	ug/L	5.00		71.0	30-160			
Surrogate: 2-Fluorophenol	3.80			ug/L	7.50		50.7	30-160			
Surrogate: Phenol-d5	2.46			ug/L	7.50		32.9	30-160			
Surrogate: 2-Chlorophenol-d4	5.86			ug/L	7.50		78.1	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	2.48			ug/L	5.00		49.6	30-160			
Surrogate: Nitrobenzene-d5	3.97			ug/L	5.00		79.5	30-160			
Surrogate: 2-Fluorobiphenyl	3.50			ug/L	5.00		70.0	30-160			
Surrogate: 2,4,6-Tribromophenol	5.71			ug/L	7.50		76.1	30-160			
Surrogate: p-Terphenyl-d14	4.32			ug/L	5.00		86.4	30-160			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0154 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0154-BLK1)						Prepared: 07-Sep-2021 Analyzed: 28-Sep-2021 12:29					
Naphthalene	0.003	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.001	0.001	0.010	ug/L							J
1-Methylnaphthalene	0.001	0.0009	0.010	ug/L							J
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	0.002	0.002	0.010	ug/L							J
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.227			ug/L	0.300		75.7	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.273			ug/L	0.300		91.0	29-120			Q
<i>Surrogate: Fluoranthene-d10</i>	0.263			ug/L	0.300		87.6	57-120			

LCS (BJI0154-BS1)						Prepared: 07-Sep-2021 Analyzed: 28-Sep-2021 12:59					
Naphthalene	0.228	0.001	0.010	ug/L	0.300		76.1	37-120			
2-Methylnaphthalene	0.228	0.001	0.010	ug/L	0.300		76.0	37-120			
1-Methylnaphthalene	0.227	0.0009	0.010	ug/L	0.300		75.7	29-120			
Acenaphthylene	0.229	0.002	0.010	ug/L	0.300		76.2	41-120			
Acenaphthene	0.215	0.003	0.010	ug/L	0.300		71.8	41-120			
Dibenzofuran	0.217	0.002	0.010	ug/L	0.300		72.3	38-120			
Fluorene	0.237	0.002	0.010	ug/L	0.300		79.0	43-120			


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 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJI0154 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0154-BS1)											
						Prepared: 07-Sep-2021		Analyzed: 28-Sep-2021 12:59			
Phenanthrene	0.234	0.001	0.010	ug/L	0.300		77.9	41-120			
Anthracene	0.217	0.001	0.010	ug/L	0.300		72.3	40-120			
Carbazole	0.246	0.001	0.010	ug/L	0.300		82.2	30-160			
Fluoranthene	0.251	0.002	0.010	ug/L	0.300		83.7	45-120			
Pyrene	0.251	0.001	0.010	ug/L	0.300		83.7	41-120			
Benzo(a)anthracene	0.251	0.0008	0.010	ug/L	0.300		83.8	42-120			
Chrysene	0.232	0.0009	0.010	ug/L	0.300		77.5	44-120			
Benzo(b)fluoranthene	0.247	0.0005	0.010	ug/L	0.300		82.2	44-120			
Benzo(k)fluoranthene	0.265	0.003	0.010	ug/L	0.300		88.3	50-120			
Benzo(j)fluoranthene	0.205	0.002	0.010	ug/L	0.300		68.4	39-160			
Benzofluoranthenes, Total	0.717	0.004	0.010	ug/L	0.900		79.6	46-120			
Benzo(a)pyrene	0.212	0.002	0.010	ug/L	0.300		70.5	35-120			
Perylene	0.190	0.006	0.010	ug/L	0.300		63.2	30-160			
Indeno(1,2,3-cd)pyrene	0.277	0.001	0.010	ug/L	0.300		92.3	37-120			
Dibenzo(a,h)anthracene	0.289	0.001	0.010	ug/L	0.300		96.2	34-120			Q
Benzo(g,h,i)perylene	0.247	0.001	0.010	ug/L	0.300		82.4	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.247			ug/L	0.300		82.5	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.315			ug/L	0.300		105	29-120			Q
Surrogate: Fluoranthene-d10	0.279			ug/L	0.300		93.1	57-120			
Matrix Spike (BJI0154-MS1)											
				Source: 21I0001-12		Prepared: 07-Sep-2021		Analyzed: 28-Sep-2021 15:00			
Naphthalene	0.226	0.001	0.010	ug/L	0.300	0.006	73.4	37-120			
2-Methylnaphthalene	0.228	0.001	0.010	ug/L	0.300	0.003	75.2	37-120			
1-Methylnaphthalene	0.228	0.0009	0.010	ug/L	0.300	0.002	75.1	29-120			
Acenaphthylene	0.227	0.002	0.010	ug/L	0.300	ND	75.5	41-120			
Acenaphthene	0.213	0.003	0.010	ug/L	0.300	ND	71.0	41-120			
Dibenzofuran	0.215	0.002	0.010	ug/L	0.300	0.003	70.6	38-120			
Fluorene	0.238	0.002	0.010	ug/L	0.300	ND	79.3	43-120			
Phenanthrene	0.223	0.001	0.010	ug/L	0.300	0.001	73.8	41-120			
Anthracene	0.218	0.001	0.010	ug/L	0.300	ND	72.8	40-120			
Carbazole	0.239	0.001	0.010	ug/L	0.300	0.001	79.2	30-160			
Fluoranthene	0.243	0.002	0.010	ug/L	0.300	ND	81.0	45-120			
Pyrene	0.243	0.001	0.010	ug/L	0.300	ND	81.0	41-120			
Benzo(a)anthracene	0.249	0.0008	0.010	ug/L	0.300	ND	83.0	42-120			
Chrysene	0.232	0.0009	0.010	ug/L	0.300	ND	77.3	44-120			


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Semivolatile Organic Compounds - SIM - Quality Control
Batch BJI0154 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJI0154-MS1)											
Source: 21I0001-12				Prepared: 07-Sep-2021 Analyzed: 28-Sep-2021 15:00							
Benzo(b)fluoranthene	0.237	0.0005	0.010	ug/L	0.300	ND	78.9	44-120			
Benzo(k)fluoranthene	0.262	0.003	0.010	ug/L	0.300	ND	87.4	50-120			
Benzo(j)fluoranthene	0.208	0.002	0.010	ug/L	0.300	ND	69.4	39-160			
Benzofluoranthenes, Total	0.707	0.004	0.010	ug/L	0.900	ND	78.6	46-120			
Benzo(a)pyrene	0.211	0.002	0.010	ug/L	0.300	ND	70.3	35-120			
Perylene	0.208	0.006	0.010	ug/L	0.300	0.022	61.9	30-160			
Indeno(1,2,3-cd)pyrene	0.259	0.001	0.010	ug/L	0.300	ND	86.5	37-120			
Dibenzo(a,h)anthracene	0.269	0.001	0.010	ug/L	0.300	ND	89.7	34-120			Q
Benzo(g,h,i)perylene	0.236	0.001	0.010	ug/L	0.300	ND	78.8	38-120			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.242			ug/L	0.300	0.232	80.8	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.295			ug/L	0.300	0.296	98.4	29-120			Q
<i>Surrogate: Fluoranthene-d10</i>	0.269			ug/L	0.300	0.266	89.8	57-120			

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

Matrix Spike Dup (BJI0154-MSD1)											
Source: 21I0001-12				Prepared: 07-Sep-2021 Analyzed: 28-Sep-2021 15:30							
Naphthalene	0.246	0.001	0.010	ug/L	0.300	0.006	80.1	37-120	8.58	30	
2-Methylnaphthalene	0.248	0.001	0.010	ug/L	0.300	0.003	81.9	37-120	8.44	30	
1-Methylnaphthalene	0.246	0.0009	0.010	ug/L	0.300	0.002	81.3	29-120	7.81	30	
Acenaphthylene	0.242	0.002	0.010	ug/L	0.300	ND	80.8	41-120	6.75	30	
Acenaphthene	0.231	0.003	0.010	ug/L	0.300	ND	76.9	41-120	8.02	30	
Dibenzofuran	0.234	0.002	0.010	ug/L	0.300	0.003	76.9	38-120	8.42	30	
Fluorene	0.257	0.002	0.010	ug/L	0.300	ND	85.6	43-120	7.59	30	
Phenanthrene	0.255	0.001	0.010	ug/L	0.300	0.001	84.6	41-120	13.50	30	
Anthracene	0.244	0.001	0.010	ug/L	0.300	ND	81.2	40-120	11.00	30	
Carbazole	0.263	0.001	0.010	ug/L	0.300	0.001	87.3	30-160	9.79	30	
Fluoranthene	0.271	0.002	0.010	ug/L	0.300	ND	90.4	45-120	11.00	30	
Pyrene	0.273	0.001	0.010	ug/L	0.300	ND	90.9	41-120	11.40	30	
Benzo(a)anthracene	0.269	0.0008	0.010	ug/L	0.300	ND	89.5	42-120	7.57	30	
Chrysene	0.250	0.0009	0.010	ug/L	0.300	ND	83.3	44-120	7.55	30	
Benzo(b)fluoranthene	0.254	0.0005	0.010	ug/L	0.300	ND	84.6	44-120	6.96	30	
Benzo(k)fluoranthene	0.271	0.003	0.010	ug/L	0.300	ND	90.4	50-120	3.34	30	
Benzo(j)fluoranthene	0.234	0.002	0.010	ug/L	0.300	ND	78.0	39-160	11.70	30	
Benzofluoranthenes, Total	0.759	0.004	0.010	ug/L	0.900	ND	84.3	46-120	7.07	30	
Benzo(a)pyrene	0.227	0.002	0.010	ug/L	0.300	ND	75.7	35-120	7.31	30	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0154 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJI0154-MSD1)		Source: 21I0001-12		Prepared: 07-Sep-2021 Analyzed: 28-Sep-2021 15:30							
Perylene	0.237	0.006	0.010	ug/L	0.300	0.022	71.4	30-160	12.90	30	
Indeno(1,2,3-cd)pyrene	0.282	0.001	0.010	ug/L	0.300	ND	94.1	37-120	8.42	30	
Dibenzo(a,h)anthracene	0.293	0.001	0.010	ug/L	0.300	ND	97.5	34-120	8.36	30	Q
Benzo(g,h,i)perylene	0.256	0.001	0.010	ug/L	0.300	ND	85.4	38-120	8.03	30	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.243			ug/L	0.300	0.232	81.0	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.298			ug/L	0.300	0.296	99.5	29-120			Q
<i>Surrogate: Fluoranthene-d10</i>	0.282			ug/L	0.300	0.266	94.0	57-120			

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


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Petroleum Hydrocarbons - Quality Control
Batch BJI0073 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0073-BLK1)										
					Prepared: 02-Sep-2021 Analyzed: 22-Sep-2021 02:31					
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.234		mg/L	0.225		104	50-150			
LCS (BJI0073-BS1)										
					Prepared: 02-Sep-2021 Analyzed: 22-Sep-2021 02:51					
Diesel Range Organics (C12-C24)	2.46	0.100	mg/L	3.00		81.9	56-120			
Surrogate: o-Terphenyl	0.218		mg/L	0.225		96.8	50-150			
Matrix Spike (BJI0073-MS1)										
		Source: 21I0001-12		Prepared: 02-Sep-2021 Analyzed: 22-Sep-2021 05:12						
Diesel Range Organics (C12-C24)	2.07	0.100	mg/L	3.00	ND	67.2	56-120			
Surrogate: o-Terphenyl	0.155		mg/L	0.225	0.268	69.1	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BJI0073-MSD1)										
		Source: 21I0001-12		Prepared: 02-Sep-2021 Analyzed: 22-Sep-2021 05:32						
Diesel Range Organics (C12-C24)	2.23	0.100	mg/L	3.00	ND	72.6	56-120	7.60	30	
Surrogate: o-Terphenyl	0.186		mg/L	0.225	0.268	82.7	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Aroclor PCB - Quality Control
Batch BJI0156 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0156-BLK1)											
						Prepared: 07-Sep-2021		Analyzed: 25-Sep-2021 20:54			
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0127			ug/L	0.0200		63.6	29-120			
Surrogate: Tetrachlorometaxylene	0.0116			ug/L	0.0200		58.0	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0127			ug/L	0.0200		63.6	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0110			ug/L	0.0200		54.8	32-120			
LCS (BJI0156-BS1)											
						Prepared: 07-Sep-2021		Analyzed: 25-Sep-2021 21:14			
Aroclor 1016 [2C]	0.042	0.002	0.010	ug/L	0.0500		83.8	54-120			
Aroclor 1260 [2C]	0.036	0.003	0.010	ug/L	0.0500		72.6	51-128			
Surrogate: Decachlorobiphenyl	0.0143			ug/L	0.0200		71.7	29-120			
Surrogate: Tetrachlorometaxylene	0.0132			ug/L	0.0200		65.9	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0142			ug/L	0.0200		71.0	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0125			ug/L	0.0200		62.6	32-120			
Matrix Spike (BJI0156-MS1)											
Source: 21I0001-12				Prepared: 07-Sep-2021		Analyzed: 25-Sep-2021 22:57					
Aroclor 1016	0.034	0.002	0.010	ug/L	0.0500	ND	67.1	54-120			
Aroclor 1260	0.038	0.003	0.010	ug/L	0.0500	ND	75.3	51-128			
Surrogate: Decachlorobiphenyl	0.0157			ug/L	0.0200		78.4	29-120			
Surrogate: Tetrachlorometaxylene	0.0112			ug/L	0.0200		56.2	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0156			ug/L	0.0200		77.8	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0104			ug/L	0.0200		52.0	32-120			
Matrix Spike Dup (BJI0156-MSD1)											
Source: 21I0001-12				Prepared: 07-Sep-2021		Analyzed: 25-Sep-2021 23:17					
Aroclor 1016	0.037	0.002	0.010	ug/L	0.0500	ND	74.8	54-120	11.00	30	
Aroclor 1260	0.037	0.003	0.010	ug/L	0.0500	ND	74.6	51-128	1.05	30	

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



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Aroclor PCB - Quality Control

Batch BJI0156 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJI0156-MSD1)		Source: 21I0001-12		Prepared: 07-Sep-2021		Analyzed: 25-Sep-2021 23:17					
Surrogate: Decachlorobiphenyl	0.0154			ug/L	0.0200		76.9	29-120			
Surrogate: Tetrachlorometaxylene	0.0130			ug/L	0.0200		65.1	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0153			ug/L	0.0200		76.4	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0123			ug/L	0.0200		61.7	32-120			

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


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Metals and Metallic Compounds - Quality Control
Batch BJI0293 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0293-BLK1)						Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:41					
Mercury	0.000032	0.000013	0.000100	mg/L							J
LCS (BJI0293-BS1)						Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:44					
Mercury	0.00175	0.000013	0.000100	mg/L	0.00200		87.5	80-120			
Duplicate (BJI0293-DUP1)						Source: 21I0001-12 Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:48					
Mercury	0.000034	0.000013	0.000100	mg/L		0.000038			11.00	20	J
Matrix Spike (BJI0293-MS1)						Source: 21I0001-12 Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:51					
Mercury	0.000886	0.000013	0.000100	mg/L	0.00100	0.000038	84.8	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJI0293-MSD1)						Source: 21I0001-12 Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:53					
Mercury	0.000873	0.000013	0.000100	mg/L	0.00100	0.000038	83.4	75-125	1.55	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Metals and Metallic Compounds - Quality Control
Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0423-BLK1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:28						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Manganese	55	ND	0.142	0.500	ug/L							U
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.179	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U
LCS (BJI0423-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:32						
Barium	135	25.2	0.114	0.500	ug/L	25.0		101	80-120			
Barium	137	25.3	0.0765	0.500	ug/L	25.0		101	80-120			
Chromium	52	25.3	0.260	0.500	ug/L	25.0		101	80-120			
Chromium	53	25.9	0.239	0.500	ug/L	25.0		103	80-120			
Iron	54	4930	18.2	36.0	ug/L	5000		98.7	80-120			
Iron	57	4620	6.63	36.0	ug/L	5000		92.4	80-120			
Manganese	55	25.4	0.142	0.500	ug/L	25.0		101	80-120			
Silver	107	23.6	0.0220	0.200	ug/L	25.0		94.3	80-120			
Vanadium	51a	24.9	0.0556	0.200	ug/L	25.0		99.5	80-120			
Vanadium	51b	25.1	0.0521	0.200	ug/L	25.0		100	80-120			
Arsenic	75a	24.6	0.0373	0.200	ug/L	25.0		98.3	80-120			
Cadmium	111	24.3	0.0300	0.100	ug/L	25.0		97.2	80-120			


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 Project: Lower Duwamish Q3
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Reported:
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Metals and Metallic Compounds - Quality Control
Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0423-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:32						
Cadmium	114	23.7	0.0400	0.100	ug/L	25.0		94.9	80-120			
Cobalt	59	23.6	0.0178	0.200	ug/L	25.0		94.5	80-120			
Copper	63	23.3	0.173	0.500	ug/L	25.0		93.4	80-120			
Copper	65	23.3	0.350	0.500	ug/L	25.0		93.2	80-120			
Nickel	60	23.5	0.0792	0.500	ug/L	25.0		94.1	80-120			
Nickel	62	23.5	0.220	0.500	ug/L	25.0		94.1	80-120			
Selenium	78	76.3	0.179	0.500	ug/L	80.0		95.4	80-120			
Zinc	66	72.9	2.92	6.00	ug/L	80.0		91.1	80-120			
Zinc	67	75.1	0.940	6.00	ug/L	80.0		93.8	80-120			
Duplicate (BJI0423-DUP1)						Source: 21I0001-12 Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 00:23						
Barium	135	13.5	0.114	0.500	ug/L		13.1			3.24	20	
Chromium	52	0.817	0.260	0.500	ug/L		0.810			0.86	20	
Iron	54	1040	18.2	36.0	ug/L		1020			2.14	20	
Lead	208	0.415	0.0513	0.100	ug/L		0.405			2.44	20	
Manganese	55	224	0.142	0.500	ug/L		222			0.71	20	
Silver	107	ND	0.0220	0.200	ug/L		ND					U
Vanadium	51a	4.14	0.0556	0.200	ug/L		4.08			1.61	20	
Arsenic	75a	1.06	0.0373	0.200	ug/L		1.10			3.52	20	
Cadmium	111	ND	0.0300	0.100	ug/L		ND					U
Cobalt	59	5.23	0.0178	0.200	ug/L		5.12			2.28	20	
Copper	63	3.36	0.173	0.500	ug/L		3.45			2.61	20	
Nickel	60	6.45	0.0792	0.500	ug/L		6.27			2.80	20	
Selenium	78	ND	0.179	0.500	ug/L		ND					U
Zinc	66	3.36	2.92	6.00	ug/L		3.38			0.62	20	J
Matrix Spike (BJI0423-MS1)						Source: 21I0001-12 Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 00:28						
Barium	135	38.2	0.114	0.500	ug/L	25.0	13.1	100	75-125			
Chromium	52	21.0	0.260	0.500	ug/L	25.0	0.810	80.7	75-125			
Iron	54	5220	18.2	36.0	ug/L	5000	1020	84.0	75-125			
Lead	208	23.9	0.0513	0.100	ug/L	25.0	0.405	94.0	75-125			
Manganese	55	236	0.142	0.500	ug/L	25.0	222	53.6	75-125			HC
Silver	107	22.3	0.0220	0.200	ug/L	25.0	ND	89.2	75-125			
Vanadium	51a	24.8	0.0556	0.200	ug/L	25.0	4.08	83.0	75-125			
Arsenic	75a	25.7	0.0373	0.200	ug/L	25.0	1.10	98.3	75-125			


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Metals and Metallic Compounds - Quality Control
Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJI0423-MS1)		Source: 21I0001-12			Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 00:28							
Cadmium	111	23.2	0.0300	0.100	ug/L	25.0	ND	92.8	75-125			
Cobalt	59	30.9	0.0178	0.200	ug/L	25.0	5.12	103	75-125			
Copper	63	27.9	0.173	0.500	ug/L	25.0	3.45	97.9	75-125			
Nickel	60	31.0	0.0792	0.500	ug/L	25.0	6.27	99.1	75-125			
Selenium	78	72.0	0.179	0.500	ug/L	80.0	ND	90.0	75-125			
Zinc	66	73.2	2.92	6.00	ug/L	80.0	3.38	87.2	75-125			

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

Matrix Spike Dup (BJI0423-MSD1)		Source: 21I0001-12			Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 00:34							
Barium	135	37.5	0.114	0.500	ug/L	25.0	13.1	97.7	75-125	1.79	20	
Chromium	52	20.5	0.260	0.500	ug/L	25.0	0.810	78.8	75-125	2.26	20	
Iron	54	5140	18.2	36.0	ug/L	5000	1020	82.4	75-125	1.56	20	
Lead	208	23.6	0.0513	0.100	ug/L	25.0	0.405	92.8	75-125	1.19	20	
Manganese	55	234	0.142	0.500	ug/L	25.0	222	45.6	75-125	0.85	20	HC
Silver	107	21.9	0.0220	0.200	ug/L	25.0	ND	87.6	75-125	1.81	20	
Vanadium	51a	24.3	0.0556	0.200	ug/L	25.0	4.08	80.8	75-125	2.19	20	
Arsenic	75a	24.8	0.0373	0.200	ug/L	25.0	1.10	94.8	75-125	3.47	20	
Cadmium	111	22.8	0.0300	0.100	ug/L	25.0	ND	91.4	75-125	1.57	20	
Cobalt	59	30.0	0.0178	0.200	ug/L	25.0	5.12	99.6	75-125	2.81	20	
Copper	63	27.2	0.173	0.500	ug/L	25.0	3.45	94.9	75-125	2.72	20	
Nickel	60	30.5	0.0792	0.500	ug/L	25.0	6.27	96.8	75-125	1.88	20	
Selenium	78	69.3	0.179	0.500	ug/L	80.0	ND	86.7	75-125	3.84	20	
Zinc	66	72.5	2.92	6.00	ug/L	80.0	3.38	86.4	75-125	0.91	20	

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

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0423-BLK2)		Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:27										
Lead	208	ND	0.0513	0.100	ug/L							U
LCS (BJI0423-BS2)		Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:31										
Lead	208	26.0	0.0513	0.100	ug/L	25.0		104	80-120			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 30-Sep-2021 16:07

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0349 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0349-BLK1)						Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:24					
Mercury, Dissolved	0.000027	0.000013	0.000100	mg/L							J
LCS (BJI0349-BS1)						Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:26					
Mercury, Dissolved	0.00175	0.000013	0.000100	mg/L	0.00200		87.6	80-120			
Duplicate (BJI0349-DUP1)						Source: 21I0001-13 Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:35					
Mercury, Dissolved	0.000030	0.000013	0.000100	mg/L		0.000027			7.72	20	J
Matrix Spike (BJI0349-MS1)						Source: 21I0001-13 Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:38					
Mercury, Dissolved	0.000932	0.000013	0.000100	mg/L	0.00100	0.000027	90.5	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJI0349-MSD1)						Source: 21I0001-13 Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:40					
Mercury, Dissolved	0.000869	0.000013	0.000100	mg/L	0.00100	0.000027	84.2	75-125	6.96	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
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Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0419 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0419-BLK1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:19						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	6.63	20.0	ug/L							U
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
LCS (BJI0419-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:23						
Barium, Dissolved	135	25.1	0.114	0.500	ug/L	25.0		100	80-120			
Barium, Dissolved	137	25.0	0.0765	0.500	ug/L	25.0		100	80-120			
Chromium, Dissolved	52	25.6	0.260	0.500	ug/L	25.0		103	80-120			
Chromium, Dissolved	53	26.0	0.239	0.500	ug/L	25.0		104	80-120			
Iron, Dissolved	54	5060	18.2	36.0	ug/L	5000		101	80-120			
Iron, Dissolved	57	4720	6.63	20.0	ug/L	5000		94.5	80-120			
Manganese, Dissolved	55	25.4	0.142	0.500	ug/L	25.0		102	80-120			
Silver, Dissolved	107	23.5	0.0220	0.200	ug/L	25.0		94.0	80-120			
Vanadium, Dissolved	51a	25.0	0.0556	0.200	ug/L	25.0		100	80-120			
Vanadium, Dissolved	51b	25.2	0.0521	0.200	ug/L	25.0		101	80-120			
Arsenic, Dissolved	75a	23.6	0.0373	0.200	ug/L	25.0		94.4	80-120			
Cadmium, Dissolved	111	24.0	0.0300	0.100	ug/L	25.0		96.0	80-120			
Cadmium, Dissolved	114	23.6	0.0400	0.100	ug/L	25.0		94.3	80-120			
Cobalt, Dissolved	59	23.7	0.0178	0.200	ug/L	25.0		94.9	80-120			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
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Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0419 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0419-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:23						
Nickel, Dissolved	60	23.4	0.0792	0.500	ug/L	25.0		93.5	80-120			
Nickel, Dissolved	62	22.9	0.220	0.500	ug/L	25.0		91.6	80-120			
Selenium, Dissolved	78	72.3	0.179	0.500	ug/L	80.0		90.4	80-120			
Zinc, Dissolved	66	70.4	2.92	6.00	ug/L	80.0		88.0	80-120			
Zinc, Dissolved	67	70.1	0.940	6.00	ug/L	80.0		87.6	80-120			
Duplicate (BJI0419-DUP1)						Source: 21I0001-13 Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 23:42						
Barium, Dissolved	135	9.90	0.114	0.500	ug/L	10.1				1.90	20	
Chromium, Dissolved	52	ND	0.260	0.500	ug/L	ND						U
Iron, Dissolved	54	54.3	18.2	36.0	ug/L	49.5				9.18	20	
Silver, Dissolved	107	ND	0.0220	0.200	ug/L	ND						U
Vanadium, Dissolved	51a	1.46	0.0556	0.200	ug/L	1.47				0.41	20	
Arsenic, Dissolved	75a	0.371	0.0373	0.200	ug/L	0.385				3.70	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L	ND						U
Cobalt, Dissolved	59	4.72	0.0178	0.200	ug/L	4.59				2.75	20	
Nickel, Dissolved	60	5.03	0.0792	0.500	ug/L	4.90				2.54	20	
Selenium, Dissolved	78	0.261	0.179	0.500	ug/L	ND						J
Zinc, Dissolved	66	ND	2.92	6.00	ug/L	ND						U
Duplicate (BJI0419-DUP2)						Source: 21I0001-13 Prepared: 15-Sep-2021 Analyzed: 20-Sep-2021 19:24						
Lead, Dissolved	208	ND	0.0513	0.100	ug/L	ND						U
Copper, Dissolved	63	1.67	0.173	0.500	ug/L	1.59				4.48	20	
Matrix Spike (BJI0419-MS1)						Source: 21I0001-13 Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 23:47						
Barium, Dissolved	135	35.9	0.114	0.500	ug/L	25.0	10.1	103	75-125			
Chromium, Dissolved	52	22.4	0.260	0.500	ug/L	25.0	ND	89.6	75-125			
Iron, Dissolved	54	4690	18.2	36.0	ug/L	5000	49.5	92.9	75-125			
Silver, Dissolved	107	21.0	0.0220	0.200	ug/L	25.0	ND	84.2	75-125			
Vanadium, Dissolved	51a	23.9	0.0556	0.200	ug/L	25.0	1.47	89.8	75-125			
Arsenic, Dissolved	75a	24.3	0.0373	0.200	ug/L	25.0	0.385	95.8	75-125			
Cadmium, Dissolved	111	22.4	0.0300	0.100	ug/L	25.0	ND	89.5	75-125			
Cobalt, Dissolved	59	28.7	0.0178	0.200	ug/L	25.0	4.59	96.3	75-125			
Nickel, Dissolved	60	27.9	0.0792	0.500	ug/L	25.0	4.90	92.0	75-125			
Selenium, Dissolved	78	71.6	0.179	0.500	ug/L	80.0	ND	89.5	75-125			
Zinc, Dissolved	66	68.1	2.92	6.00	ug/L	80.0	ND	85.1	75-125			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0419 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJI0419-MS2)			Source: 21I0001-13			Prepared: 15-Sep-2021			Analyzed: 20-Sep-2021 19:27			
Lead, Dissolved	208	25.3	0.0513	0.100	ug/L	25.0	ND	101	75-125			
Copper, Dissolved	63	25.9	0.173	0.500	ug/L	25.0	1.59	97.1	75-125			

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

Matrix Spike Dup (BJI0419-MSD1)			Source: 21I0001-13			Prepared: 15-Sep-2021			Analyzed: 15-Sep-2021 23:52			
Barium, Dissolved	135	35.7	0.114	0.500	ug/L	25.0	10.1	103	75-125	0.60	20	
Chromium, Dissolved	52	22.2	0.260	0.500	ug/L	25.0	ND	88.8	75-125	0.85	20	
Iron, Dissolved	54	4630	18.2	36.0	ug/L	5000	49.5	91.7	75-125	1.31	20	
Silver, Dissolved	107	20.8	0.0220	0.200	ug/L	25.0	ND	83.1	75-125	1.33	20	
Vanadium, Dissolved	51a	23.7	0.0556	0.200	ug/L	25.0	1.47	89.0	75-125	0.75	20	
Arsenic, Dissolved	75a	24.2	0.0373	0.200	ug/L	25.0	0.385	95.1	75-125	0.76	20	
Cadmium, Dissolved	111	22.4	0.0300	0.100	ug/L	25.0	ND	89.7	75-125	0.22	20	
Cobalt, Dissolved	59	28.1	0.0178	0.200	ug/L	25.0	4.59	94.0	75-125	2.02	20	
Nickel, Dissolved	60	27.7	0.0792	0.500	ug/L	25.0	4.90	91.3	75-125	0.59	20	
Selenium, Dissolved	78	69.9	0.179	0.500	ug/L	80.0	ND	87.3	75-125	2.47	20	
Zinc, Dissolved	66	66.6	2.92	6.00	ug/L	80.0	ND	83.3	75-125	2.21	20	

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

Matrix Spike Dup (BJI0419-MSD2)			Source: 21I0001-13			Prepared: 15-Sep-2021			Analyzed: 20-Sep-2021 19:31			
Lead, Dissolved	208	24.8	0.0513	0.100	ug/L	25.0	ND	99.2	75-125	2.10	20	
Copper, Dissolved	63	25.9	0.173	0.500	ug/L	25.0	1.59	97.3	75-125	0.18	20	

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

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Blank (BJI0419-BLK2)						Prepared: 15-Sep-2021			Analyzed: 16-Sep-2021 20:17			
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U

LCS (BJI0419-BS2)						Prepared: 15-Sep-2021			Analyzed: 16-Sep-2021 20:22			
Lead, Dissolved	208	25.5	0.0513	0.100	ug/L	25.0		102	80-120			


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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0419 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0419-BS2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:22						
Copper, Dissolved	63	27.0	0.173	0.500	ug/L	25.0		108	80-120			
Copper, Dissolved	65	26.3	0.350	0.500	ug/L	25.0		105	80-120			
Duplicate (BJI0419-DUP3)						Source: 21I0001-13 Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 23:20						
Manganese, Dissolved	55	276	0.710	2.50	ug/L		277			0.55	20	D
Matrix Spike (BJI0419-MS3)						Source: 21I0001-13 Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 23:25						
Manganese, Dissolved	55	298	0.710	2.50	ug/L	25.0	277	84.3	75-125			HC, D

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

Matrix Spike Dup (BJI0419-MSD3)						Source: 21I0001-13 Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 23:30						
Manganese, Dissolved	55	292	0.710	2.50	ug/L	25.0	277	60.5	75-125	2.01	20	HC, D

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
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC



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Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE



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Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE



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m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE



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1,2-Dichloroethane

NELAP,WADOE

Benzene

NELAP,WADOE

EPA 8270E in Water

Phenol

NELAP,DoD-ELAP

bis(2-chloroethyl) ether

NELAP,DoD-ELAP

2-Chlorophenol

NELAP,DoD-ELAP

1,3-Dichlorobenzene

NELAP,DoD-ELAP

1,4-Dichlorobenzene

NELAP,DoD-ELAP

1,2-Dichlorobenzene

NELAP,DoD-ELAP

Benzyl Alcohol

NELAP,DoD-ELAP

2,2'-Oxybis(1-chloropropane)

NELAP,DoD-ELAP

2-Methylphenol

NELAP,DoD-ELAP

Hexachloroethane

NELAP,DoD-ELAP

N-Nitroso-di-n-Propylamine

NELAP,DoD-ELAP

4-Methylphenol

NELAP,DoD-ELAP

Nitrobenzene

NELAP,DoD-ELAP

Isophorone

NELAP,DoD-ELAP

2-Nitrophenol

NELAP,DoD-ELAP

2,4-Dimethylphenol

NELAP,DoD-ELAP

Bis(2-Chloroethoxy)methane

NELAP,DoD-ELAP

2,4-Dichlorophenol

NELAP,DoD-ELAP

1,2,4-Trichlorobenzene

NELAP,DoD-ELAP

Naphthalene

NELAP,DoD-ELAP

Benzoic acid

NELAP,DoD-ELAP

4-Chloroaniline

NELAP,DoD-ELAP

Hexachlorobutadiene

NELAP,DoD-ELAP

4-Chloro-3-Methylphenol

NELAP,DoD-ELAP

2-Methylnaphthalene

NELAP,DoD-ELAP

Hexachlorocyclopentadiene

NELAP,DoD-ELAP

2,4,6-Trichlorophenol

NELAP,DoD-ELAP

2,4,5-Trichlorophenol

NELAP,DoD-ELAP

2-Chloronaphthalene

NELAP,DoD-ELAP

2-Nitroaniline

NELAP,DoD-ELAP

Acenaphthylene

NELAP,DoD-ELAP

Dimethylphthalate

NELAP,DoD-ELAP

2,6-Dinitrotoluene

NELAP,DoD-ELAP

Acenaphthene

NELAP,DoD-ELAP

3-Nitroaniline

NELAP,DoD-ELAP

2,4-Dinitrophenol

NELAP,DoD-ELAP



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Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)fluoranthene, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Project Manager: Meg Strong

Reported:
30-Sep-2021 16:07

Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

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Reported:
30-Sep-2021 16:07

Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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30-Sep-2021 16:07

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
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.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

05 October 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q3

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.

Associated Work Order(s)
2110012

Associated SDG ID(s)
N/A

Digitally signed by Shelly
Shelly Fishel Fishel
Date: 2021.10.05 13:15:46
-07'00'

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 enclose 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.

A handwritten signature in blue ink that reads "Shelly Fishel".

Shelly Fishel, Project Manager

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: <u>2110012</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>1</u>		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com																																																																																																																																																																																																																																				
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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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-60-20210109	21I0012-01	Water	01-Sep-2021 14:30	01-Sep-2021 15:43
MW-60-20210109	21I0012-02	Water	01-Sep-2021 14:30	01-Sep-2021 15:43
MW-53-20210109	21I0012-03	Water	01-Sep-2021 08:45	01-Sep-2021 15:43
MW-53-20210109	21I0012-04	Water	01-Sep-2021 08:45	01-Sep-2021 15:43
TB-12-20210109	21I0012-05	Water	01-Sep-2021 09:30	01-Sep-2021 15:43
MW-63-20210109	21I0012-06	Water	01-Sep-2021 10:30	01-Sep-2021 15:43
MW-63-20210109	21I0012-07	Water	01-Sep-2021 10:30	01-Sep-2021 15:43
MW-64-20210109	21I0012-08	Water	01-Sep-2021 11:30	01-Sep-2021 15:43
MW-64-20210109	21I0012-09	Water	01-Sep-2021 11:30	01-Sep-2021 15:43
MW-41-20210109	21I0012-10	Water	01-Sep-2021 12:30	01-Sep-2021 15:43
MW-41-20210109	21I0012-11	Water	01-Sep-2021 12:30	01-Sep-2021 15:43
MW-40-20210109	21I0012-12	Water	01-Sep-2021 13:30	01-Sep-2021 15:43
MW-40-20210109	21I0012-13	Water	01-Sep-2021 13:30	01-Sep-2021 15:43



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05-Oct-2021 11:51

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q3
Work Order: 2110012

Sample receipt

Samples as listed on the preceding page were received 01-Sep-2021 15:43 under ARI work order 2110012. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.



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05-Oct-2021 11:51

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Benzo(g,h,i)perylene and Hexachlorocyclopentadiene which were out of control low in the continuing calibration verification SJI0403-CCV1. Additionally Pentachlorophenol, 2,4-Dinitrophenol, 4,6-Dinitro-2-Methylphenol, 4-Nitrophenol, Benzoic Acid and Hexachlorocyclopentadiene which were out of control low and 2,2'-Oxybis(1-Chloropropane) and Isophorone which were out of control high in the second source calibration verification SJI0403-SCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Phenol-d5 which was out of control low in samples 21I0012-03, 21I0012-06, 21I0012-10 and 21I0012-12 as well as the method blank BJI0189-BLK1, blank spike BJI0189-BS1 and blank spike duplicate BJI0189-BSD1. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.



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The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits except Benzoic Acid, 4-Chloroaniline, Hexachlorocyclopentadiene, 4-Nitrophenol and surrogate Phenol-d5 which were out of control low in BJI0012-BS1 and BJI0012-BSD1 and have been flagged.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Dibenzo(a,h)anthracene and surrogate Dibenzo(a,h)anthracene-d14 which were out of control high in the initial calibration verification SJI0424-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Dibenzo(a,h)anthracene-d14 which was out of control high in the initial calibration verification SJI0424-ICV1 and has been "Q" flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0012-04 in Dissolved Metals batch BJI0460. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) were within advisory control limits. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times except Sulfite. The Sulfite holding time was exceeded upon sample receipt and has been flagged.

Initial and continuing calibrations were within method requirements.



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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
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05-Oct-2021 11:51

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0012-01 in Sulfite batch BJI0040, Ferrous Iron batch BJI0038 and Anions batch BJI0086. The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0012-13 in Dissolved Mercury batch BJI0383. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) were within advisory control limits. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatile Gases - MEE by RSK175

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21I0012-01 in batch BJI0109. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits.



WORK ORDER

21I0012

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH
21I0012-01 A	HDPE NM, 500 mL	
21I0012-01 B	Small OJ, 500 mL	
21I0012-01 C	Small OJ, 500 mL	
21I0012-01 D	Small OJ, 500 mL, EDTA	
21I0012-01 E	Glass NM, Amber, 500 mL, HCl	Lab to verify preservation ① C2 pass
21I0012-01 F	HDPE NM, 500 mL, 1:1 HNO ₃	
21I0012-01 G	Glass NM, Amber, 1000 mL	
21I0012-01 H	Glass NM, Amber, 1000 mL	
21I0012-01 I	Glass NM, Amber, 500 mL	
21I0012-01 J	Glass NM, Amber, 500 mL	
21I0012-01 K	Glass NM, Amber, 500 mL	
21I0012-01 L	Glass NM, Amber, 500 mL	
21I0012-01 M	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 N	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 O	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 P	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 Q	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 R	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 S	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 T	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 U	VOA Vial, Clear, 40 mL, HCL	
21I0012-02 A	HDPE NM, 500 mL	7.2 Feril

JBm
Preservation Confirmed By

09/01/2021
Date

① pH < 2, significant headspace
BF 1645 09/01/21



WORK ORDER

21I0012

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH
21I0012-01 A	HDPE NM, 500 mL	
21I0012-01 B	Small OJ, 500 mL	
21I0012-01 C	Small OJ, 500 mL	
21I0012-01 D	Small OJ, 500 mL, EDTA	
21I0012-01 E	Glass NM, Amber, 500 mL, HCl	Lab to verify preservation C2 Pass
21I0012-01 F	HDPE NM, 500 mL, 1:1 HNO ₃	
21I0012-01 G	Glass NM, Amber, 1000 mL	
21I0012-01 H	Glass NM, Amber, 1000 mL	
21I0012-01 I	Glass NM, Amber, 500 mL	
21I0012-01 J	Glass NM, Amber, 500 mL	
21I0012-01 K	Glass NM, Amber, 500 mL	
21I0012-01 L	Glass NM, Amber, 500 mL	
21I0012-01 M	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 N	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 O	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 P	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 Q	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 R	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 S	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 T	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 U	VOA Vial, Clear, 40 mL, HCL	
21I0012-02 A	HDPE NM, 500 mL	72 Feril (1)

JB
Preservation Confirmed By

09/01/2021 Date
① Filtered at 0.45 µm
and preserved to pH < 2.0
with 0.75 mL conc. HNO₃ (37647).
ml 09/01/21



WORK ORDER

21I0012

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH
21I0012-01 A	HDPE NM, 500 mL	
21I0012-01 B	Small OJ, 500 mL	
21I0012-01 C	Small OJ, 500 mL	
21I0012-01 D	Small OJ, 500 mL, EDTA	
21I0012-01 E	Glass NM, Amber, 500 mL, HCl	Lab to verify preservation 52 Pass
21I0012-01 F	HDPE NM, 500 mL, 1:1 HNO ₃	
21I0012-01 G	Glass NM, Amber, 1000 mL	
21I0012-01 H	Glass NM, Amber, 1000 mL	
21I0012-01 I	Glass NM, Amber, 500 mL	
21I0012-01 J	Glass NM, Amber, 500 mL	
21I0012-01 K	Glass NM, Amber, 500 mL	
21I0012-01 L	Glass NM, Amber, 500 mL	
21I0012-01 M	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 N	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 O	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 P	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 Q	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 R	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 S	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 T	VOA Vial, Clear, 40 mL, HCL	
21I0012-01 U	VOA Vial, Clear, 40 mL, HCL	
21I0012-02 A	HDPE NM, 500 mL	72 Fail
21I0012-02 A 01	HDPE NM, 500 mL	
21I0012-03 A	HDPE NM, 500 mL, 1:1 HNO ₃	52 Pass
21I0012-03 B	Glass NM, Amber, 1000 mL	
21I0012-03 C	Glass NM, Amber, 1000 mL	
21I0012-03 D	Glass NM, Amber, 500 mL	
21I0012-03 E	Glass NM, Amber, 500 mL	
21I0012-03 F	Glass NM, Amber, 500 mL	
21I0012-03 G	Glass NM, Amber, 500 mL	
21I0012-03 H	Glass NM, Amber, 500 mL	
21I0012-03 I	Glass NM, Amber, 500 mL	
21I0012-03 J	VOA Vial, Clear, 40 mL, HCL	
21I0012-03 K	VOA Vial, Clear, 40 mL, HCL	
21I0012-03 L	VOA Vial, Clear, 40 mL, HCL	



WORK ORDER

21I0012

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0012-03 M	VOA Vial, Clear, 40 mL, HCL		
21I0012-03 N	VOA Vial, Clear, 40 mL, HCL		
21I0012-04 A	HDPE NM, 500 mL	22	Fail
21I0012-05 A	VOA Vial, Clear, 40 mL, HCL	22	
21I0012-05 B	VOA Vial, Clear, 40 mL, HCL		
21I0012-05 C	VOA Vial, Clear, 40 mL, HCL		
21I0012-05 D	VOA Vial, Clear, 40 mL, HCL		
21I0012-05 E	VOA Vial, Clear, 40 mL, HCL		
21I0012-06 A	HDPE NM, 500 mL, 1:1 HNO3	22	Pass
21I0012-06 B	Glass NM, Amber, 1000 mL		
21I0012-06 C	Glass NM, Amber, 1000 mL		
21I0012-06 D	Glass NM, Amber, 500 mL		
21I0012-06 E	Glass NM, Amber, 500 mL		
21I0012-06 F	Glass NM, Amber, 500 mL		
21I0012-06 G	Glass NM, Amber, 500 mL		
21I0012-06 H	VOA Vial, Clear, 40 mL, HCL		
21I0012-06 I	VOA Vial, Clear, 40 mL, HCL		
21I0012-06 J	VOA Vial, Clear, 40 mL, HCL		
21I0012-06 K	VOA Vial, Clear, 40 mL, HCL		
21I0012-06 L	VOA Vial, Clear, 40 mL, HCL		
21I0012-07 A	HDPE NM, 500 mL	22	Fail
21I0012-08 A	HDPE NM, 500 mL, 1:1 HNO3	22	Pass
21I0012-08 B	Glass NM, Amber, 1000 mL		
21I0012-08 C	Glass NM, Amber, 1000 mL		
21I0012-08 D	Glass NM, Amber, 500 mL		
21I0012-08 E	Glass NM, Amber, 500 mL		
21I0012-08 F	Glass NM, Amber, 500 mL		
21I0012-08 G	Glass NM, Amber, 500 mL		
21I0012-08 H	VOA Vial, Clear, 40 mL, HCL		
21I0012-08 I	VOA Vial, Clear, 40 mL, HCL		
21I0012-08 J	VOA Vial, Clear, 40 mL, HCL		
21I0012-08 K	VOA Vial, Clear, 40 mL, HCL		
21I0012-08 L	VOA Vial, Clear, 40 mL, HCL		
21I0012-09 A	HDPE NM, 500 mL	22	Fail
21I0012-10 A	HDPE NM, 500 mL, 1:1 HNO3	22	Pass
21I0012-10 B	Glass NM, Amber, 500 mL		
21I0012-10 C	Glass NM, Amber, 500 mL		



WORK ORDER

21I0012

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0012-10 D	Glass NM, Amber, 500 mL		
21I0012-10 E	Glass NM, Amber, 500 mL		
21I0012-10 F	Glass NM, Amber, 500 mL		
21I0012-10 G	Glass NM, Amber, 500 mL		
21I0012-10 H	VOA Vial, Clear, 40 mL, HCL		
21I0012-10 I	VOA Vial, Clear, 40 mL, HCL		
21I0012-10 J	VOA Vial, Clear, 40 mL, HCL		
21I0012-10 K	VOA Vial, Clear, 40 mL, HCL		
21I0012-10 L	VOA Vial, Clear, 40 mL, HCL		
21I0012-11 A	HDPE NM, 500 mL	22	Fail
21I0012-12 A	HDPE NM, 500 mL, 1:1 HNO3	22	Pass
21I0012-12 B	Glass NM, Amber, 500 mL		
21I0012-12 C	Glass NM, Amber, 500 mL		
21I0012-12 D	Glass NM, Amber, 500 mL		
21I0012-12 E	Glass NM, Amber, 500 mL		
21I0012-12 F	Glass NM, Amber, 500 mL		
21I0012-12 G	Glass NM, Amber, 500 mL		
21I0012-12 H	VOA Vial, Clear, 40 mL, HCL		
21I0012-12 I	VOA Vial, Clear, 40 mL, HCL		
21I0012-12 J	VOA Vial, Clear, 40 mL, HCL		
21I0012-12 K	VOA Vial, Clear, 40 mL, HCL		
21I0012-12 L	VOA Vial, Clear, 40 mL, HCL		
21I0012-13 A	HDPE NM, 500 mL	22	Fail

JS
Preservation Confirmed By

09/02/2021
Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson Inc.

Project Name: LDW

COC No(s): _____ NA

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

Assigned ARI Job No: 2170012

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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: 1543

4.3 4.5 3.3

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 3206

Cooler Accepted by: DC

Date: 09/01/21

Time: 1543

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

How were bottles sealed in plastic bags? Individually Grouped Not

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: 08/31/2021

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JS Date: 09/02/2021 Time: 1657 Labels checked by: JS

**** 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:

vials w/ air bubbles marked on preservation sheet, lab to determine sizes.

By: JS Date: 09/02/2021



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 14:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 13:32

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-01 M

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.06	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	0.16	ug/L	J
Xylenes, total	1330-20-7	1	0.22	0.60	0.25	ug/L	J
Surrogate: 1,2-Dichloroethane-d4				80-129 %	104	%	
Surrogate: Toluene-d8				80-120 %	99.0	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	94.0	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	103	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Volatile Organic Compounds

Method: NWTPHg
Instrument: NT2 Analyst: PKC

Sampled: 09/01/2021 14:30

Analyzed: 09/07/2021 13:32

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) Extract ID: 21I0012-01 M
Preparation Batch: BJI0168 Sample Size: 10 mL
Prepared: 09/07/2021 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	131	ug/L	
HC ID: GRO						
Surrogate: Toluene-d8			80-120 %	99.0	%	
Surrogate: 4-Bromofluorobenzene			80-120 %	94.0	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/01/2021 14:30

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 16:23

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-01 S

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	9.62	ng/L	J
Surrogate: 1,2-Dichloroethane-d4				80-129 %	113	%	
Surrogate: Toluene-d8				80-120 %	98.9	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	95.2	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Dissolved Gases

Method: EPA RSK-175

Sampled: 09/01/2021 14:30

Instrument: FID6 Analyst: LH

Analyzed: 09/03/2021 12:25

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-01 U

Preparation Batch: BJI0109

Sample Size: 10 mL

Prepared: 09/03/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	9330	ug/L	
Ethane	74-84-0	1	1.23	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Acetylene	74-86-2	1	1.06	ND	ug/L	U
<i>Surrogate: Propane</i>			<i>72-122 %</i>	<i>84.0</i>	<i>%</i>	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 14:30

Analyzed: 09/28/2021 17:30

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-01 I 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-01 I 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.009	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.009	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.632	ug/L	
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	4.85	ug/L	E
Dibenzofuran	132-64-9	1	0.002	0.010	0.025	ug/L	
Fluorene	86-73-7	1	0.002	0.010	1.16	ug/L	E
Phenanthrene	85-01-8	1	0.001	0.010	0.607	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.039	ug/L	
Carbazole	86-74-8	1	0.001	0.010	0.028	ug/L	
Fluoranthene	206-44-0	1	0.002	0.010	0.004	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	0.008	ug/L	J
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	76.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	86.5 %	Q
Surrogate: Fluoranthene-d10					57-120 %	82.1 %	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/01/2021 14:30

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 08:33

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-01 K 01

Preparation Batch: BJI0192

Sample Size: 500 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	1.12	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	97.5	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

MW-60-20210109
21I0012-01 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 09/01/2021 14:30
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 16:48
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0012-01 G 01
	Preparation Batch: BJI0191	Sample Size: 1000 mL	
	Prepared: 09/08/2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0012-01 G 01
	Cleanup Batch: CJI0201	Initial Volume: 0.5 mL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0012-01 G 01
	Cleanup Batch: CJI0199	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0012-01 G 01
	Cleanup Batch: CJI0200	Initial Volume: 0.5 uL	
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	68.4	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	58.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	66.3	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	62.8	%	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:59

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-01 F 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	28.3	ug/L	
Chromium	7440-47-3	1	0.260	0.500	2.56	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.837	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	9.92	ug/L	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 00:59

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-01 F 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	16.1	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	1.14	ug/L	
Copper	7440-50-8	1	0.173	0.500	5.05	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	3.67	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	3.95	ug/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/01/2021 14:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:23

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-01 F

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000044	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Wet Chemistry

Method: EPA 300.0

Sampled: 09/01/2021 14:30

Instrument: IC930 Analyst: CDE

Analyzed: 09/02/2021 17:56

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21I0012-01 B

Preparation Batch: BJI0086

Sample Size: 10 mL

Prepared: 09/02/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-01 (Water)

Wet Chemistry

Method: SM 4500-SO3 B-00

Sampled: 09/01/2021 14:30

Instrument: N/A Analyst: CDE

Analyzed: 09/01/2021 17:07

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21I0012-01

Preparation Batch: BJ10040

Sample Size: 50 mL

Prepared: 09/01/2021

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfite	14265-45-3	1	1.4	1.4	ND	mg/L	H, U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109
21I0012-01RE1 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 14:30

Analyzed: 09/30/2021 11:50

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-01RE1 I 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-01RE1 I 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	20	0.026	0.200	ND	ug/L	U
2-Methylnaphthalene	91-57-6	20	0.020	0.200	ND	ug/L	U
1-Methylnaphthalene	90-12-0	20	0.018	0.200	0.782	ug/L	D
Acenaphthylene	208-96-8	20	0.037	0.200	ND	ug/L	U
Acenaphthene	83-32-9	20	0.058	0.200	16.6	ug/L	D
Dibenzofuran	132-64-9	20	0.030	0.200	ND	ug/L	U
Fluorene	86-73-7	20	0.030	0.200	1.39	ug/L	D
Phenanthrene	85-01-8	20	0.026	0.200	0.696	ug/L	D
Anthracene	120-12-7	20	0.023	0.200	0.055	ug/L	J, D
Carbazole	86-74-8	20	0.024	0.200	0.025	ug/L	J, D
Fluoranthene	206-44-0	20	0.034	0.200	ND	ug/L	U
Pyrene	129-00-0	20	0.024	0.200	ND	ug/L	U
Benzo(a)anthracene	56-55-3	20	0.015	0.200	ND	ug/L	U
Chrysene	218-01-9	20	0.018	0.200	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	20	0.009	0.200	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	20	0.064	0.200	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	20	0.037	0.200	ND	ug/L	U
Benzofluoranthenes, Total		20	0.071	0.200	ND	ug/L	U
Benzo(a)pyrene	50-32-8	20	0.050	0.200	ND	ug/L	U
Perylene	1985-5-0	20	0.117	0.200	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	20	0.020	0.200	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	20	0.027	0.200	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	20	0.028	0.200	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	87.9	%
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	67.3	%
Surrogate: Fluoranthene-d10					57-120 %	80.5	%



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109
21I0012-01RE1 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/16/2021 22:55

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-01RE1 F 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron	7439-89-6	10	66.3	360	54100	ug/L	D
Manganese	7439-96-5	10	1.42	5.00	1300	ug/L	D



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109
21I0012-01RE1 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 09/01/2021 14:30

Instrument: UV1800-2 Analyst: BF

Analyzed: 09/01/2021 17:21

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21I0012-01RE1 E

Preparation Batch: BJI0038

Sample Size: 5 mL

Prepared: 09/01/2021

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		50	2.00	2.00	59.0	mg/L	D



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109
21I0012-01RE3 (Water)

Wet Chemistry

Method: EPA 300.0

Sampled: 09/01/2021 14:30

Instrument: IC930 Analyst: CDE

Analyzed: 09/23/2021 17:18

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21I0012-01RE3 B

Preparation Batch: BJI0086

Sample Size: 10 mL

Prepared: 09/02/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	5	0.500	0.500	10.4	mg/L	D

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	0.500	0.500	ND	mg/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 09/01/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:03

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-02 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	0.999	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.624	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	2.14	ug/L	



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Analytical Report

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400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:03

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-02 A 02

Preparation Batch: BJI0419

Sample Size: 25 mL

Filtration Batch: BJI0036

Prepared: 09/15/2021

Final Volume: 25 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	12.8	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.289	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	1.38	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109

21I0012-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/01/2021 14:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 15:52

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-02 A 01

Preparation Batch: BJI0349

Sample Size: 20 mL

Filtration Batch: BJI0036

Prepared: 09/13/2021

Final Volume: 20 mL

Filtration Date: 09/01/2021 15:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000027	mg/L	J



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-60-20210109
21I0012-02RE1 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B		Sampled: 09/01/2021 14:30
Instrument: ICPMS1 Analyst: MCB		Analyzed: 09/16/2021 22:59
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21I0012-02RE1 A 02
	Preparation Batch: BJI0419	Filtration Batch: BJI0036
	Prepared: 09/15/2021	Filtration Date: 09/01/2021 15:43
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	10	66.3	200	33800	ug/L	D
Manganese, Dissolved	7439-96-5	10	1.42	5.00	1070	ug/L	D



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 08:45

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 13:52

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-03 M

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	0.13	ug/L	J
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	103	%	
Surrogate: Toluene-d8				80-120 %	97.4	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	97.2	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	100	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

2110012-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/01/2021 08:45

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 18:47

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 2110012-03 L

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	7.26	ng/L	J
Surrogate: 1,2-Dichloroethane-d4				80-129 %	112	%	
Surrogate: Toluene-d8				80-120 %	97.4	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	92.4	%	



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/01/2021 08:45

Instrument: NT10 Analyst: VTS

Analyzed: 09/26/2021 05:28

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-03 B 01

Preparation Batch: BJI0189

Sample Size: 1000 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	36.6	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	17.1	%	*
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	82.3	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	83.4	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	83.3	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	87.9	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	98.6	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	82.3	%	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 08:45

Analyzed: 09/28/2021 18:00

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL

Final Volume: 0.5 mL

Extract ID: 21I0012-03 D 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL

Final Volume: 0.5 mL

Extract ID: 21I0012-03 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.001	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.007	ug/L	J
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.003	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	76.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	90.6 %	Q
Surrogate: Fluoranthene-d10					57-120 %	86.4 %	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/01/2021 08:45

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 08:53

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-03 F 01

Preparation Batch: BJI0192

Sample Size: 500 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>117</i>	<i>%</i>	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Aroclor PCB

Method: EPA 8082A			Sampled: 09/01/2021 08:45	
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 17:09	
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0012-03 C 01	
	Preparation Batch: BJI0191	Sample Size: 1000 mL		
	Prepared: 09/08/2021	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0012-03 C 01	
	Cleanup Batch: CJI0201	Initial Volume: 0.5 mL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID: 21I0012-03 C 01	
	Cleanup Batch: CJI0199	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID: 21I0012-03 C 01	
	Cleanup Batch: CJI0200	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	70.8	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	68.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	68.9	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	64.0	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 08:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:08

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0012-03 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	6.22	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	6.63	36.0	3540	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	1	0.142	0.500	114	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.20	ug/L	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 08:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:08

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-03 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	0.456	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.493	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.294	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	2.40	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-03 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/01/2021 08:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:25

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-03 A

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000040	mg/L	J



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 09/01/2021 08:45
Instrument: ICPMS1 Analyst: MCB	Analyzed: 09/17/2021 01:21
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJI0460
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21I0012-04 A 02
	Filtration Batch: BJI0110
	Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	4.54	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	6.63	20.0	2980	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	1	0.142	0.500	112	ug/L	
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	1.06	ug/L	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 08:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:21

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-04 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.376	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.460	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	2.24	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-53-20210109

21I0012-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/01/2021 08:45

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:13

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-04 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000023	mg/L	J



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

TB-12-20210109

21I0012-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 09:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 12:27

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-05 B

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.09	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.14	0.50	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	110	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	98.5	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	96.1	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	102	%	



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Reported:
05-Oct-2021 11:51

TB-12-20210109

21I0012-05 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/01/2021 09:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 12:27

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-05 B

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	98.5	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	96.1	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

TB-12-20210109

21I0012-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/01/2021 09:30

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 17:04

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-05 A

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	113	%	
Surrogate: Toluene-d8				80-120 %	98.2	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	92.6	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

2110012-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 10:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 14:13

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 2110012-06 I

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	108	%	
Surrogate: Toluene-d8				80-120 %	98.5	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	95.0	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	98.5	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/01/2021 10:30

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 17:25

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-06 H

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	111	%	
Surrogate: Toluene-d8				80-120 %	97.7	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	93.0	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/01/2021 10:30

Instrument: NT10 Analyst: VTS

Analyzed: 09/26/2021 06:06

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-06 B 01

Preparation Batch: BJI0189

Sample Size: 1000 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.02	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.03	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	0.04	1.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.1	1.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	ND	ug/L	U
3-Nitroaniline	99-09-2	1	0.2	1.0	ND	ug/L	U



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/01/2021 10:30

Instrument: NT10 Analyst: VTS

Analyzed: 09/26/2021 06:06

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2,4-Dinitrophenol	51-28-5	1	0.2	2.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.06	0.2	ND	ug/L	U
4-Nitroaniline	100-01-6	1	0.2	1.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	ND	ug/L	U
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.03	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.3	1.0	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.08	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.04	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
Surrogate: 2-Fluorophenol				30-160 %	35.1	%	
Surrogate: Phenol-d5				30-160 %	16.2	%	*
Surrogate: 2-Chlorophenol-d4				30-160 %	75.0	%	
Surrogate: 1,2-Dichlorobenzene-d4				30-160 %	74.6	%	
Surrogate: Nitrobenzene-d5				30-160 %	79.1	%	
Surrogate: 2-Fluorobiphenyl				30-160 %	82.0	%	



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Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/01/2021 10:30

Instrument: NT10 Analyst: VTS

Analyzed: 09/26/2021 06:06

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 2,4,6-Tribromophenol		30-160 %	92.2	%	
Surrogate: p-Terphenyl-d14		30-160 %	77.7	%	



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05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/01/2021 10:30

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 09:14

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-06 E 01

Preparation Batch: BJI0192

Sample Size: 475 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.105	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.211	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>104</i>	<i>%</i>	



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Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Aroclor PCB

Method: EPA 8082A			Sampled: 09/01/2021 10:30	
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 17:29	
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0012-06 C 01	
	Preparation Batch: BJI0191	Sample Size: 1000 mL		
	Prepared: 09/08/2021	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0012-06 C 01	
	Cleanup Batch: CJI0201	Initial Volume: 0.5 mL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID: 21I0012-06 C 01	
	Cleanup Batch: CJI0199	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID: 21I0012-06 C 01	
	Cleanup Batch: CJI0200	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	64.4	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	61.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	63.5	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	56.4	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:12

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-06 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	4.62	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	6.63	36.0	6020	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	10	1.42	5.00	886	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.31	ug/L	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:12

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0012-06 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	10.4	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	1.07	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.31	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	2.16	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-06 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/01/2021 10:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:28

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-06 A

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000029	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 09/01/2021 10:30
Instrument: ICPMS1 Analyst: MCB	Analyzed: 09/17/2021 02:10
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJI0460
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21I0012-07 A 02
	Filtration Batch: BJI0110
	Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	2.94	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	6.63	20.0	3950	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	848	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	0.473	ug/L	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:10

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-07 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	2.91	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.971	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.726	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	1.99	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-63-20210109

21I0012-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/01/2021 10:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:15

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-07 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 11:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 14:34

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-08 I

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.24	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.07	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	109	%	
Surrogate: Toluene-d8				80-120 %	99.8	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	95.6	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	99.1	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-08 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 11:30

Analyzed: 09/28/2021 18:31

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-08 D 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-08 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.001	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.019	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	67.9 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	72.2 %	Q
Surrogate: Fluoranthene-d10					57-120 %	78.1 %	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-08 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/01/2021 11:30

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 09:34

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-08 F 01

Preparation Batch: BJI0192

Sample Size: 500 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.141	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	96.1	%	


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 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

MW-64-20210109
21I0012-08 (Water)
Aroclor PCB

Method: EPA 8082A			Sampled: 09/01/2021 11:30
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 17:50
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0012-08 B 01
	Preparation Batch: BJI0191		
	Prepared: 09/08/2021		
	Sample Size: 1000 mL		
	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0012-08 B 01
	Cleanup Batch: CJI0201		
	Cleaned: 24-Sep-2021		
	Initial Volume: 0.5 mL		
	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0012-08 B 01
	Cleanup Batch: CJI0199		
	Cleaned: 24-Sep-2021		
	Initial Volume: 0.5 uL		
	Final Volume: 0.5 uL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0012-08 B 01
	Cleanup Batch: CJI0200		
	Cleaned: 24-Sep-2021		
	Initial Volume: 0.5 uL		
	Final Volume: 0.5 uL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	66.7	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	68.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	67.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	63.9	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 11:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:17

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-08 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	11.1	ug/L	
Chromium	7440-47-3	1	0.260	0.500	0.775	ug/L	
Iron	7439-89-6	1	18.2	36.0	10900	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.305	ug/L	
Manganese	7439-96-5	10	1.42	5.00	816	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.96	ug/L	



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Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 11:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 01:17

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-08 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	3.51	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.238	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.893	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	0.794	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-08 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/01/2021 11:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:30

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-08 A

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000031	mg/L	J



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 09/01/2021 11:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:15

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-09 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	0.738	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.282	ug/L	J
Iron, Dissolved	7439-89-6	1	18.2	36.0	1080	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	710	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	0.380	ug/L	



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 11:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:15

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-09 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	1.61	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.183	ug/L	J
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.361	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Reported:
05-Oct-2021 11:51

MW-64-20210109

21I0012-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/01/2021 11:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:17

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-09 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000030	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 12:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 14:54

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-10 I

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.51	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.1	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	93.8	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	104	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/01/2021 12:30

Instrument: NT10 Analyst: VTS

Analyzed: 09/26/2021 06:43

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-10 B 01

Preparation Batch: BJI0189

Sample Size: 1000 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	37.6	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	18.8	%	*
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	82.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	77.4	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	83.2	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	85.3	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	104	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	72.8	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 12:30

Analyzed: 09/28/2021 19:01

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-10 D 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-10 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.014	ug/L	
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.003	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.058	ug/L	
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	2.88	ug/L	E
Dibenzofuran	132-64-9	1	0.002	0.010	0.005	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	1.56	ug/L	E
Phenanthrene	85-01-8	1	0.001	0.010	0.277	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.010	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	0.002	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	0.003	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.005	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	0.001	ug/L	J
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	0.0009	ug/L	J
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	81.8 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	85.5 %	Q
Surrogate: Fluoranthene-d10					57-120 %	94.3 %	



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/01/2021 12:30

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 09:54

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-10 F 01

Preparation Batch: BJI0192

Sample Size: 500 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.909	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	106	%	



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Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 12:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:01

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0012-10 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0513	0.100	0.138	ug/L	
Manganese	7439-96-5	10	1.42	5.00	823	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U



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Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 12:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:01

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-10 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	60.6	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	1.18	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	1.52	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-10 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/01/2021 12:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:37

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-10 A

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000031	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109
21I0012-10RE1 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 12:30

Analyzed: 09/30/2021 12:21

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-10RE1 D 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL
Final Volume: 0.5 mL

Extract ID: 21I0012-10RE1 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	10	0.013	0.100	ND	ug/L	U
2-Methylnaphthalene	91-57-6	10	0.010	0.100	ND	ug/L	U
1-Methylnaphthalene	90-12-0	10	0.009	0.100	0.057	ug/L	J, D
Acenaphthylene	208-96-8	10	0.019	0.100	ND	ug/L	U
Acenaphthene	83-32-9	10	0.029	0.100	4.48	ug/L	D
Dibenzofuran	132-64-9	10	0.015	0.100	ND	ug/L	U
Fluorene	86-73-7	10	0.015	0.100	1.84	ug/L	D
Phenanthrene	85-01-8	10	0.013	0.100	0.271	ug/L	D
Anthracene	120-12-7	10	0.012	0.100	ND	ug/L	U
Carbazole	86-74-8	10	0.012	0.100	ND	ug/L	U
Fluoranthene	206-44-0	10	0.017	0.100	ND	ug/L	U
Pyrene	129-00-0	10	0.012	0.100	ND	ug/L	U
Benzo(a)anthracene	56-55-3	10	0.008	0.100	ND	ug/L	U
Chrysene	218-01-9	10	0.009	0.100	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	10	0.005	0.100	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	10	0.032	0.100	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	10	0.019	0.100	ND	ug/L	U
Benzofluoranthenes, Total		10	0.036	0.100	ND	ug/L	U
Benzo(a)pyrene	50-32-8	10	0.025	0.100	ND	ug/L	U
Perylene	1985-5-0	10	0.059	0.100	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	0.010	0.100	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	10	0.013	0.100	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	10	0.014	0.100	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	82.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	64.8 %	
Surrogate: Fluoranthene-d10					57-120 %	91.8 %	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 09/01/2021 12:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:19

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-11 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	744	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 12:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:19

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0012-11 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	34.0	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.424	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-41-20210109

21I0012-11 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/01/2021 12:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:20

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-11 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000030	mg/L	J



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/01/2021 13:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 15:15

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0012-12 H

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.34	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.6	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	94.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	103	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/01/2021 13:30

Instrument: NT10 Analyst: VTS

Analyzed: 09/26/2021 07:21

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-12 B 01

Preparation Batch: BJI0189

Sample Size: 1000 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	35.9	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	18.2	%	*
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	76.3	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	72.6	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	79.0	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	85.8	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	96.8	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	74.5	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/01/2021 13:30

Analyzed: 09/28/2021 19:31

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0190
Prepared: 09/08/2021

Sample Size: 500 mL

Final Volume: 0.5 mL

Extract ID: 21I0012-12 D 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0195
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL

Final Volume: 0.5 mL

Extract ID: 21I0012-12 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.003	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.001	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.240	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.007	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	73.2 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	93.4 %	Q
Surrogate: Fluoranthene-d10					57-120 %	88.0 %	



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Analytical Report

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Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/01/2021 13:30

Instrument: FID4 Analyst: TWC

Analyzed: 09/22/2021 10:14

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0012-12 F 01

Preparation Batch: BJI0192

Sample Size: 475 mL

Prepared: 09/08/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.105	0.550	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.211	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	92.9	%	



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Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/01/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:06

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-12 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0513	0.100	0.0850	ug/L	J
Manganese	7439-96-5	10	1.42	5.00	1310	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U



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Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:06

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-12 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	18.5	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	0.796	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	2.00	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.204	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-12 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/01/2021 13:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 14:39

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-12 A

Preparation Batch: BJI0293

Sample Size: 20 mL

Prepared: 09/10/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000030	mg/L	J



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 09/01/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:23

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0012-13 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	1180	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/01/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:23

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0012-13 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	5.07	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.837	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

MW-40-20210109

21I0012-13 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/01/2021 13:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:03

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0012-13 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000020	mg/L	J


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

Volatile Organic Compounds - Quality Control
Batch BJI0168 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0168-BLK1)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 12:07			
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	4.88		ug/L	5.00		97.7	80-120			
Surrogate: 4-Bromofluorobenzene	4.78		ug/L	5.00		95.5	80-120			
Blank (BJI0168-BLK2)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 12:07			
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Methyl tert-butyl Ether	ND	0.14	0.50	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	5.30		ug/L	5.00		106	80-129			
Surrogate: Toluene-d8	4.88		ug/L	5.00		97.7	80-120			
Surrogate: 4-Bromofluorobenzene	4.78		ug/L	5.00		95.5	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.00		102	80-120			
LCS (BJI0168-BS1)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 10:24			
Gasoline Range Organics (Tol-Nap)	1120	100	ug/L	1000		112	72-128			
Surrogate: Toluene-d8	5.08		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.04		ug/L	5.00		101	80-120			
LCS (BJI0168-BS2)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 10:45			
Vinyl Chloride	9.88	0.08	0.20	ug/L	10.0	98.8	66-133			
1,1-Dichloroethene	10.4	0.08	0.20	ug/L	10.0	104	69-135			
trans-1,2-Dichloroethene	9.45	0.07	0.20	ug/L	10.0	94.5	78-128			
cis-1,2-Dichloroethene	10.1	0.08	0.20	ug/L	10.0	101	80-121			
Benzene	9.91	0.05	0.20	ug/L	10.0	99.1	80-120			


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Volatile Organic Compounds - Quality Control
Batch BJI0168 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0168-BS2)											
Prepared: 07-Sep-2021						Analyzed: 07-Sep-2021 10:45					
Trichloroethene	9.91	0.07	0.20	ug/L	10.0		99.1	80-120			
Toluene	9.59	0.05	0.20	ug/L	10.0		95.9	80-120			
Tetrachloroethene	9.92	0.09	0.20	ug/L	10.0		99.2	80-120			
Ethylbenzene	9.72	0.05	0.20	ug/L	10.0		97.2	80-120			
m,p-Xylene	20.0	0.14	0.40	ug/L	20.0		100	80-121			
o-Xylene	9.74	0.08	0.20	ug/L	10.0		97.4	80-121			
Xylenes, total	29.7	0.22	0.60	ug/L	30.0		99.2	76-127			
Methyl tert-butyl Ether	10.1	0.14	0.50	ug/L	10.0		101	71-132			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.46			ug/L	5.00		109	80-129			
<i>Surrogate: Toluene-d8</i>	5.07			ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.01			ug/L	5.00		100	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.97			ug/L	5.00		99.3	80-120			
LCS Dup (BJI0168-BSD1)											
Prepared: 07-Sep-2021						Analyzed: 07-Sep-2021 11:05					
Gasoline Range Organics (Tol-Nap)	1050		100	ug/L	1000		105	72-128	6.31	30	
<i>Surrogate: Toluene-d8</i>	5.04			ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.89			ug/L	5.00		97.8	80-120			
LCS Dup (BJI0168-BSD2)											
Prepared: 07-Sep-2021						Analyzed: 07-Sep-2021 11:26					
Vinyl Chloride	10.7	0.08	0.20	ug/L	10.0		107	66-133	8.10	30	
1,1-Dichloroethene	10.8	0.08	0.20	ug/L	10.0		108	69-135	3.85	30	
trans-1,2-Dichloroethene	10.1	0.07	0.20	ug/L	10.0		101	78-128	6.81	30	
cis-1,2-Dichloroethene	10.4	0.08	0.20	ug/L	10.0		104	80-121	3.30	30	
Benzene	10.4	0.05	0.20	ug/L	10.0		104	80-120	5.19	30	
Trichloroethene	10.6	0.07	0.20	ug/L	10.0		106	80-120	6.31	30	
Toluene	10.2	0.05	0.20	ug/L	10.0		102	80-120	5.71	30	
Tetrachloroethene	10.1	0.09	0.20	ug/L	10.0		101	80-120	1.94	30	
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	3.56	30	
m,p-Xylene	20.6	0.14	0.40	ug/L	20.0		103	80-121	2.78	30	
o-Xylene	10.2	0.08	0.20	ug/L	10.0		102	80-121	4.49	30	
Xylenes, total	30.8	0.22	0.60	ug/L	30.0		103	76-127	3.35	30	
Methyl tert-butyl Ether	10.7	0.14	0.50	ug/L	10.0		107	71-132	5.57	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.35			ug/L	5.00		107	80-129			
<i>Surrogate: Toluene-d8</i>	5.08			ug/L	5.00		102	80-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Volatile Organic Compounds - Quality Control

Batch BJI0168 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJI0168-BSD2)					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 11:26				
Surrogate: 4-Bromofluorobenzene	5.16			ug/L	5.00		103	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.98			ug/L	5.00		99.7	80-120			



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Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Volatile Organic Compounds - SIM - Quality Control

Batch BJI0273 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0273-BLK1)					Prepared: 08-Sep-2021 Analyzed: 09-Sep-2021 16:03						
Vinyl chloride	6.23	5.01	20.0	ng/L							J
Surrogate: 1,2-Dichloroethane-d4	5710			ng/L	5000		114	80-129			
Surrogate: Toluene-d8	5010			ng/L	5000		100	80-120			
Surrogate: 4-Bromofluorobenzene	4730			ng/L	5000		94.6	75-125			
LCS (BJI0273-BS1)					Prepared: 08-Sep-2021 Analyzed: 09-Sep-2021 15:02						
Vinyl chloride	2350	5.01	20.0	ng/L	2000		117	62-141			
Surrogate: 1,2-Dichloroethane-d4	5530			ng/L	5000		111	80-129			
Surrogate: Toluene-d8	5130			ng/L	5000		103	80-120			
Surrogate: 4-Bromofluorobenzene	4920			ng/L	5000		98.4	75-125			
LCS Dup (BJI0273-BSD1)					Prepared: 08-Sep-2021 Analyzed: 09-Sep-2021 15:23						
Vinyl chloride	2000	5.01	20.0	ng/L	2000		100	62-141	15.90	30	
Surrogate: 1,2-Dichloroethane-d4	5500			ng/L	5000		110	80-129			
Surrogate: Toluene-d8	5110			ng/L	5000		102	80-120			
Surrogate: 4-Bromofluorobenzene	4980			ng/L	5000		99.7	75-125			


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Reported:
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Dissolved Gases - Quality Control
Batch BJI0109 - EPA 5030C (Purge and Trap)

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0109-BLK1)		Prepared: 03-Sep-2021 Analyzed: 03-Sep-2021 10:32								
Methane	ND	0.65	ug/L							U
Ethane	ND	1.23	ug/L							U
Ethene	ND	1.14	ug/L							U
Acetylene	ND	1.06	ug/L							U
Surrogate: Propane	1550		ug/L	1800		86.4	72-122			
LCS (BJI0109-BS1)		Prepared: 03-Sep-2021 Analyzed: 03-Sep-2021 09:15								
Methane	716	0.65	ug/L	656		109	80-120			
Ethane	1410	1.23	ug/L	1230		115	80-120			
Ethene	1280	1.14	ug/L	1150		112	80-120			
Acetylene	1130	1.06	ug/L	1060		107	73-123			E
Surrogate: Propane	1850		ug/L	1800		103	62-122			
LCS Dup (BJI0109-BSD1)		Prepared: 03-Sep-2021 Analyzed: 03-Sep-2021 09:33								
Methane	711	0.65	ug/L	656		108	80-120	0.62	30	
Ethane	1410	1.23	ug/L	1230		114	80-120	0.28	30	
Ethene	1280	1.14	ug/L	1150		111	80-120	0.37	30	
Acetylene	1150	1.06	ug/L	1060		109	73-123	2.10	30	E
Surrogate: Propane	1790		ug/L	1800		99.7	62-122			
Duplicate (BJI0109-DUP1)		Source: 21I0012-01 Prepared: 03-Sep-2021 Analyzed: 03-Sep-2021 12:43								
Methane	8650	0.65	ug/L		9330			7.56	30	
Ethane	ND	1.23	ug/L		ND					U
Ethene	ND	1.14	ug/L		ND					U
Acetylene	ND	1.06	ug/L		ND					U
Surrogate: Propane	1390		ug/L	1800	1510	77.0	72-122			



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Semivolatile Organic Compounds - Quality Control

Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0189-BLK1)						Prepared: 08-Sep-2021 Analyzed: 26-Sep-2021 03:34					
Phenol	ND	0.01	0.2	ug/L							U
bis(2-chloroethyl) ether	ND	0.03	0.2	ug/L							U
2-Chlorophenol	ND	0.03	0.2	ug/L							U
1,3-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
Benzyl Alcohol	ND	0.02	0.2	ug/L							U
2,2'-Oxybis(1-chloropropane)	ND	0.03	0.2	ug/L							U
2-Methylphenol	ND	0.03	0.2	ug/L							U
Hexachloroethane	ND	0.04	0.2	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.04	0.2	ug/L							U
4-Methylphenol	ND	0.03	0.2	ug/L							U
Nitrobenzene	ND	0.03	0.2	ug/L							U
Isophorone	ND	0.03	0.2	ug/L							U
2-Nitrophenol	ND	0.04	1.0	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.03	0.2	ug/L							U
2,4-Dichlorophenol	ND	0.1	1.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.03	0.2	ug/L							U
Naphthalene	ND	0.03	0.2	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
4-Chloroaniline	ND	0.04	1.0	ug/L							U
Hexachlorobutadiene	ND	0.04	0.2	ug/L							U
4-Chloro-3-Methylphenol	ND	0.1	1.0	ug/L							U
2-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Hexachlorocyclopentadiene	ND	0.1	1.0	ug/L							U
2,4,6-Trichlorophenol	ND	0.2	1.0	ug/L							U
2,4,5-Trichlorophenol	ND	0.1	1.0	ug/L							U
2-Chloronaphthalene	ND	0.03	0.2	ug/L							U
2-Nitroaniline	ND	0.2	1.0	ug/L							U
Acenaphthylene	ND	0.02	0.2	ug/L							U
Dimethylphthalate	ND	0.04	0.2	ug/L							U
2,6-Dinitrotoluene	ND	0.2	1.0	ug/L							U
Acenaphthene	ND	0.03	0.2	ug/L							U
3-Nitroaniline	ND	0.2	1.0	ug/L							U



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Semivolatile Organic Compounds - Quality Control

Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0189-BLK1)						Prepared: 08-Sep-2021 Analyzed: 26-Sep-2021 03:34					
2,4-Dinitrophenol	ND	0.2	2.0	ug/L							U
Dibenzofuran	ND	0.02	0.2	ug/L							U
4-Nitrophenol	ND	0.06	1.0	ug/L							U
2,4-Dinitrotoluene	ND	0.1	1.0	ug/L							U
Fluorene	ND	0.02	0.2	ug/L							U
4-Chlorophenylphenyl ether	ND	0.02	0.2	ug/L							U
Diethyl phthalate	ND	0.06	0.2	ug/L							U
4-Nitroaniline	ND	0.2	1.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	0.4	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
4-Bromophenyl phenyl ether	ND	0.02	0.2	ug/L							U
Hexachlorobenzene	ND	0.04	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Phenanthrene	ND	0.02	0.2	ug/L							U
Anthracene	ND	0.03	0.2	ug/L							U
Carbazole	ND	0.04	0.2	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Fluoranthene	ND	0.03	0.2	ug/L							U
Pyrene	ND	0.03	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
Benzo(a)anthracene	ND	0.04	0.2	ug/L							U
3,3'-Dichlorobenzidine	ND	0.3	1.0	ug/L							U
Chrysene	ND	0.04	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
Di-n-Octylphthalate	ND	0.05	0.2	ug/L							U
Benzo(a)fluoranthene, Total	ND	0.08	0.4	ug/L							U
Benzo(a)pyrene	ND	0.05	0.2	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.06	0.2	ug/L							U
Dibenzo(a,h)anthracene	ND	0.07	0.2	ug/L							U
Benzo(g,h,i)perylene	ND	0.04	0.2	ug/L							U
1-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Surrogate: 2-Fluorophenol	2.94			ug/L	7.50		39.2	30-160			
Surrogate: Phenol-d5	1.47			ug/L	7.50		19.6	30-160			*
Surrogate: 2-Chlorophenol-d4	6.28			ug/L	7.50		83.7	30-160			


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Semivolatile Organic Compounds - Quality Control
Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0189-BLK1)						Prepared: 08-Sep-2021	Analyzed: 26-Sep-2021 03:34				
Surrogate: 1,2-Dichlorobenzene-d4	3.99			ug/L	5.00		79.8	30-160			
Surrogate: Nitrobenzene-d5	4.21			ug/L	5.00		84.2	30-160			
Surrogate: 2-Fluorobiphenyl	5.03			ug/L	5.00		101	30-160			
Surrogate: 2,4,6-Tribromophenol	8.09			ug/L	7.50		108	30-160			
Surrogate: p-Terphenyl-d14	4.24			ug/L	5.00		84.8	30-160			
LCS (BJI0189-BS1)						Prepared: 08-Sep-2021	Analyzed: 26-Sep-2021 04:12				
Phenol	1.2	0.01	0.2	ug/L	5.00		24.6	30-160			*
bis(2-chloroethyl) ether	4.3	0.03	0.2	ug/L	5.00		87.0	30-160			
2-Chlorophenol	3.6	0.03	0.2	ug/L	5.00		73.0	30-160			
1,3-Dichlorobenzene	3.5	0.03	0.2	ug/L	5.00		70.0	30-160			
1,4-Dichlorobenzene	4.0	0.03	0.2	ug/L	5.00		80.7	30-160			
1,2-Dichlorobenzene	3.7	0.03	0.2	ug/L	5.00		73.8	30-160			
Benzyl Alcohol	2.1	0.02	0.2	ug/L	5.00		42.5	30-160			
2,2'-Oxybis(1-chloropropane)	5.1	0.03	0.2	ug/L	5.00		101	30-160			
2-Methylphenol	2.6	0.03	0.2	ug/L	5.00		53.0	30-160			
Hexachloroethane	3.0	0.04	0.2	ug/L	5.00		60.5	30-160			
N-Nitroso-di-n-Propylamine	2.8	0.04	0.2	ug/L	5.00		55.3	30-160			
4-Methylphenol	2.5	0.03	0.2	ug/L	5.00		49.4	30-160			
Nitrobenzene	4.1	0.03	0.2	ug/L	5.00		82.0	30-160			
Isophorone	5.4	0.03	0.2	ug/L	5.00		108	30-160			
2-Nitrophenol	4.2	0.04	1.0	ug/L	5.00		83.7	30-160			
2,4-Dimethylphenol	7.4	0.3	1.0	ug/L	13.0		57.2	30-160			
Bis(2-Chloroethoxy)methane	4.4	0.03	0.2	ug/L	5.00		88.2	30-160			
2,4-Dichlorophenol	13.0	0.1	1.0	ug/L	13.0		100	30-160			
1,2,4-Trichlorobenzene	3.7	0.03	0.2	ug/L	5.00		73.6	30-160			
Naphthalene	3.9	0.03	0.2	ug/L	5.00		77.5	30-160			
Benzoic acid	5.3	0.1	2.0	ug/L	23.0		22.9	30-160			*
4-Chloroaniline	1.4	0.04	1.0	ug/L	13.0		10.5	30-160			*
Hexachlorobutadiene	3.1	0.04	0.2	ug/L	5.00		62.7	30-160			
4-Chloro-3-Methylphenol	10.5	0.1	1.0	ug/L	13.0		80.6	30-160			
2-Methylnaphthalene	4.0	0.03	0.2	ug/L	5.00		80.9	30-160			
Hexachlorocyclopentadiene	1.4	0.1	1.0	ug/L	13.0		11.0	30-160			*
2,4,6-Trichlorophenol	12.4	0.2	1.0	ug/L	13.0		95.7	30-160			
2,4,5-Trichlorophenol	12.2	0.1	1.0	ug/L	13.0		93.6	30-160			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Semivolatile Organic Compounds - Quality Control

Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0189-BS1)					Prepared: 08-Sep-2021 Analyzed: 26-Sep-2021 04:12						
2-Chloronaphthalene	4.2	0.03	0.2	ug/L	5.00		83.9	30-160			
2-Nitroaniline	12.0	0.2	1.0	ug/L	13.0		92.7	30-160			
Acenaphthylene	3.5	0.02	0.2	ug/L	5.00		69.9	30-160			
Dimethylphthalate	4.3	0.04	0.2	ug/L	5.00		85.5	30-160			
2,6-Dinitrotoluene	13.4	0.2	1.0	ug/L	13.0		103	30-160			
Acenaphthene	4.0	0.03	0.2	ug/L	5.00		79.4	30-160			
3-Nitroaniline	9.4	0.2	1.0	ug/L	13.0		72.2	30-160			
2,4-Dinitrophenol	20.5	0.2	2.0	ug/L	23.0		89.0	30-160			
Dibenzofuran	4.4	0.02	0.2	ug/L	5.00		88.1	30-160			
4-Nitrophenol	2.9	0.06	1.0	ug/L	13.0		22.6	30-160			*
2,4-Dinitrotoluene	13.0	0.1	1.0	ug/L	13.0		100	30-160			
Fluorene	3.8	0.02	0.2	ug/L	5.00		75.2	30-160			
4-Chlorophenylphenyl ether	4.1	0.02	0.2	ug/L	5.00		82.6	30-160			
Diethyl phthalate	4.3	0.06	0.2	ug/L	5.00		85.4	30-160			
4-Nitroaniline	10.1	0.2	1.0	ug/L	13.0		77.9	30-160			
4,6-Dinitro-2-methylphenol	19.2	0.4	2.0	ug/L	23.0		83.6	30-160			
N-Nitrosodiphenylamine	3.5	0.03	0.2	ug/L	5.00		70.8	30-160			
4-Bromophenyl phenyl ether	4.6	0.02	0.2	ug/L	5.00		92.3	30-160			
Hexachlorobenzene	4.3	0.04	0.2	ug/L	5.00		86.9	30-160			
Pentachlorophenol	14.3	0.1	1.0	ug/L	13.0		110	30-160			
Phenanthrene	4.0	0.02	0.2	ug/L	5.00		80.0	30-160			
Anthracene	3.8	0.03	0.2	ug/L	5.00		76.1	30-160			
Carbazole	4.0	0.04	0.2	ug/L	5.00		80.3	30-160			
Di-n-Butylphthalate	4.4	0.05	0.2	ug/L	5.00		87.2	30-160			
Fluoranthene	3.3	0.03	0.2	ug/L	5.00		65.2	30-160			
Pyrene	3.5	0.03	0.2	ug/L	5.00		69.7	30-160			
Butylbenzylphthalate	3.8	0.07	0.2	ug/L	5.00		75.5	30-160			
Benzo(a)anthracene	4.0	0.04	0.2	ug/L	5.00		79.0	30-160			
3,3'-Dichlorobenzidine	9.5	0.3	1.0	ug/L	13.0		73.2	30-160			
Chrysene	4.2	0.04	0.2	ug/L	5.00		83.0	30-160			
bis(2-Ethylhexyl)phthalate	4.5	0.2	0.2	ug/L	5.00		90.6	30-160			
Di-n-Octylphthalate	4.4	0.05	0.2	ug/L	5.00		88.2	30-160			
Benzo(a)fluoranthene, Total	8.8	0.08	0.4	ug/L	10.0		88.2	30-160			
Benzo(a)pyrene	3.8	0.05	0.2	ug/L	5.00		75.7	30-160			
Indeno(1,2,3-cd)pyrene	2.3	0.06	0.2	ug/L	5.00		45.3	30-160			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

Semivolatile Organic Compounds - Quality Control
Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0189-BS1)											
Prepared: 08-Sep-2021						Analyzed: 26-Sep-2021 04:12					
Dibenzo(a,h)anthracene	2.5	0.07	0.2	ug/L	5.00		50.4	30-160			
Benzo(g,h,i)perylene	1.8	0.04	0.2	ug/L	5.00		35.9	30-160			
1-Methylnaphthalene	4.4	0.03	0.2	ug/L	5.00		88.4	30-160			
Surrogate: 2-Fluorophenol	3.08			ug/L	7.50		41.1	30-160			
Surrogate: Phenol-d5	1.71			ug/L	7.50		22.8	30-160			*
Surrogate: 2-Chlorophenol-d4	6.42			ug/L	7.50		85.6	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.89			ug/L	5.00		77.9	30-160			
Surrogate: Nitrobenzene-d5	4.41			ug/L	5.00		88.2	30-160			
Surrogate: 2-Fluorobiphenyl	4.52			ug/L	5.00		90.5	30-160			
Surrogate: 2,4,6-Tribromophenol	6.98			ug/L	7.50		93.1	30-160			
Surrogate: p-Terphenyl-d14	3.80			ug/L	5.00		75.9	30-160			
LCS Dup (BJI0189-BSD1)											
Prepared: 08-Sep-2021						Analyzed: 26-Sep-2021 04:50					
Phenol	1.5	0.01	0.2	ug/L	5.00		29.1	30-160	16.70	30	*
bis(2-chloroethyl) ether	5.1	0.03	0.2	ug/L	5.00		102	30-160	15.50	30	
2-Chlorophenol	4.2	0.03	0.2	ug/L	5.00		83.1	30-160	13.00	30	
1,3-Dichlorobenzene	4.0	0.03	0.2	ug/L	5.00		80.5	30-160	14.00	30	
1,4-Dichlorobenzene	4.6	0.03	0.2	ug/L	5.00		92.5	30-160	13.70	30	
1,2-Dichlorobenzene	4.3	0.03	0.2	ug/L	5.00		85.1	30-160	14.20	30	
Benzyl Alcohol	2.5	0.02	0.2	ug/L	5.00		50.8	30-160	17.80	30	
2,2'-Oxybis(1-chloropropane)	5.8	0.03	0.2	ug/L	5.00		115	30-160	13.10	30	
2-Methylphenol	3.1	0.03	0.2	ug/L	5.00		61.5	30-160	14.90	30	
Hexachloroethane	3.6	0.04	0.2	ug/L	5.00		72.1	30-160	17.40	30	
N-Nitroso-di-n-Propylamine	3.4	0.04	0.2	ug/L	5.00		67.8	30-160	20.20	30	
4-Methylphenol	2.9	0.03	0.2	ug/L	5.00		58.0	30-160	16.00	30	
Nitrobenzene	4.9	0.03	0.2	ug/L	5.00		97.0	30-160	16.80	30	
Isophorone	7.2	0.03	0.2	ug/L	5.00		144	30-160	28.50	30	
2-Nitrophenol	4.9	0.04	1.0	ug/L	5.00		98.8	30-160	16.60	30	
2,4-Dimethylphenol	8.8	0.3	1.0	ug/L	13.0		67.6	30-160	16.60	30	
Bis(2-Chloroethoxy)methane	5.0	0.03	0.2	ug/L	5.00		100	30-160	12.50	30	
2,4-Dichlorophenol	14.7	0.1	1.0	ug/L	13.0		113	30-160	12.60	30	
1,2,4-Trichlorobenzene	4.1	0.03	0.2	ug/L	5.00		82.9	30-160	11.90	30	
Naphthalene	4.5	0.03	0.2	ug/L	5.00		89.3	30-160	14.10	30	
Benzoic acid	6.7	0.1	2.0	ug/L	23.0		29.1	30-160	23.90	30	*
4-Chloroaniline	1.4	0.04	1.0	ug/L	13.0		10.9	30-160	3.70	30	*



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Semivolatile Organic Compounds - Quality Control

Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJI0189-BSD1)						Prepared: 08-Sep-2021 Analyzed: 26-Sep-2021 04:50					
Hexachlorobutadiene	3.7	0.04	0.2	ug/L	5.00		73.3	30-160	15.70	30	
4-Chloro-3-Methylphenol	11.9	0.1	1.0	ug/L	13.0		91.8	30-160	12.90	30	
2-Methylnaphthalene	4.7	0.03	0.2	ug/L	5.00		93.7	30-160	14.70	30	
Hexachlorocyclopentadiene	2.4	0.1	1.0	ug/L	13.0		18.2	30-160	49.10	30	*
2,4,6-Trichlorophenol	13.8	0.2	1.0	ug/L	13.0		106	30-160	10.30	30	
2,4,5-Trichlorophenol	13.7	0.1	1.0	ug/L	13.0		106	30-160	12.00	30	
2-Chloronaphthalene	4.9	0.03	0.2	ug/L	5.00		97.3	30-160	14.80	30	
2-Nitroaniline	14.5	0.2	1.0	ug/L	13.0		111	30-160	18.20	30	
Acenaphthylene	4.0	0.02	0.2	ug/L	5.00		79.1	30-160	12.40	30	
Dimethylphthalate	4.9	0.04	0.2	ug/L	5.00		98.0	30-160	13.60	30	
2,6-Dinitrotoluene	15.8	0.2	1.0	ug/L	13.0		121	30-160	16.50	30	
Acenaphthene	4.6	0.03	0.2	ug/L	5.00		91.5	30-160	14.20	30	
3-Nitroaniline	10.4	0.2	1.0	ug/L	13.0		80.1	30-160	10.40	30	
2,4-Dinitrophenol	23.8	0.2	2.0	ug/L	23.0		103	30-160	15.00	30	
Dibenzofuran	5.1	0.02	0.2	ug/L	5.00		102	30-160	14.80	30	
4-Nitrophenol	3.5	0.06	1.0	ug/L	13.0		26.9	30-160	17.40	30	*
2,4-Dinitrotoluene	15.2	0.1	1.0	ug/L	13.0		117	30-160	15.60	30	
Fluorene	4.3	0.02	0.2	ug/L	5.00		86.5	30-160	14.00	30	
4-Chlorophenylphenyl ether	4.7	0.02	0.2	ug/L	5.00		94.5	30-160	13.40	30	
Diethyl phthalate	4.9	0.06	0.2	ug/L	5.00		98.2	30-160	13.90	30	
4-Nitroaniline	12.5	0.2	1.0	ug/L	13.0		95.9	30-160	20.70	30	
4,6-Dinitro-2-methylphenol	21.9	0.4	2.0	ug/L	23.0		95.2	30-160	12.90	30	
N-Nitrosodiphenylamine	4.1	0.03	0.2	ug/L	5.00		81.9	30-160	14.40	30	
4-Bromophenyl phenyl ether	5.4	0.02	0.2	ug/L	5.00		107	30-160	15.10	30	
Hexachlorobenzene	4.8	0.04	0.2	ug/L	5.00		96.1	30-160	10.10	30	
Pentachlorophenol	15.4	0.1	1.0	ug/L	13.0		119	30-160	7.42	30	
Phenanthrene	4.7	0.02	0.2	ug/L	5.00		94.4	30-160	16.50	30	
Anthracene	4.5	0.03	0.2	ug/L	5.00		89.2	30-160	15.90	30	
Carbazole	4.8	0.04	0.2	ug/L	5.00		96.5	30-160	18.30	30	
Di-n-Butylphthalate	5.3	0.05	0.2	ug/L	5.00		105	30-160	18.70	30	
Fluoranthene	3.8	0.03	0.2	ug/L	5.00		76.6	30-160	16.10	30	
Pyrene	4.0	0.03	0.2	ug/L	5.00		80.4	30-160	14.30	30	
Butylbenzylphthalate	4.3	0.07	0.2	ug/L	5.00		86.8	30-160	13.90	30	
Benzo(a)anthracene	4.5	0.04	0.2	ug/L	5.00		90.2	30-160	13.20	30	
3,3'-Dichlorobenzidine	10.9	0.3	1.0	ug/L	13.0		83.8	30-160	13.60	30	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Semivolatile Organic Compounds - Quality Control

Batch BJI0189 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJI0189-BSD1)						Prepared: 08-Sep-2021 Analyzed: 26-Sep-2021 04:50					
Chrysene	4.7	0.04	0.2	ug/L	5.00		93.7	30-160	12.10	30	
bis(2-Ethylhexyl)phthalate	5.1	0.2	0.2	ug/L	5.00		102	30-160	12.30	30	
Di-n-Octylphthalate	5.0	0.05	0.2	ug/L	5.00		101	30-160	13.20	30	
Benzo(a)fluoranthene, Total	10.3	0.08	0.4	ug/L	10.0		103	30-160	15.20	30	
Benzo(a)pyrene	4.5	0.05	0.2	ug/L	5.00		90.6	30-160	18.00	30	
Indeno(1,2,3-cd)pyrene	2.7	0.06	0.2	ug/L	5.00		54.4	30-160	18.40	30	
Dibenzo(a,h)anthracene	3.0	0.07	0.2	ug/L	5.00		60.1	30-160	17.50	30	
Benzo(g,h,i)perylene	2.1	0.04	0.2	ug/L	5.00		42.1	30-160	16.00	30	
1-Methylnaphthalene	5.1	0.03	0.2	ug/L	5.00		101	30-160	13.70	30	
Surrogate: 2-Fluorophenol	3.43			ug/L	7.50		45.8	30-160			
Surrogate: Phenol-d5	1.95			ug/L	7.50		26.0	30-160			*
Surrogate: 2-Chlorophenol-d4	7.10			ug/L	7.50		94.7	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	4.32			ug/L	5.00		86.3	30-160			
Surrogate: Nitrobenzene-d5	4.85			ug/L	5.00		97.0	30-160			
Surrogate: 2-Fluorobiphenyl	4.95			ug/L	5.00		99.1	30-160			
Surrogate: 2,4,6-Tribromophenol	7.75			ug/L	7.50		103	30-160			
Surrogate: p-Terphenyl-d14	4.14			ug/L	5.00		82.7	30-160			



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0190 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0190-BLK1)						Prepared: 08-Sep-2021 Analyzed: 28-Sep-2021 16:00					
Naphthalene	0.002	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.001	0.001	0.010	ug/L							J
1-Methylnaphthalene	ND	0.0009	0.010	ug/L							U
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	0.002	0.002	0.010	ug/L							J
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.214			ug/L	0.300		71.4	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.264			ug/L	0.300		88.0	29-120			Q
<i>Surrogate: Fluoranthene-d10</i>	0.253			ug/L	0.300		84.4	57-120			

LCS (BJI0190-BS1)						Prepared: 08-Sep-2021 Analyzed: 28-Sep-2021 16:30					
Naphthalene	0.220	0.001	0.010	ug/L	0.300		73.4	37-120			
2-Methylnaphthalene	0.220	0.001	0.010	ug/L	0.300		73.4	37-120			
1-Methylnaphthalene	0.221	0.0009	0.010	ug/L	0.300		73.6	29-120			
Acenaphthylene	0.228	0.002	0.010	ug/L	0.300		75.9	41-120			
Acenaphthene	0.215	0.003	0.010	ug/L	0.300		71.8	41-120			
Dibenzofuran	0.217	0.002	0.010	ug/L	0.300		72.3	38-120			
Fluorene	0.232	0.002	0.010	ug/L	0.300		77.2	43-120			



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Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0190 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0190-BS1)						Prepared: 08-Sep-2021	Analyzed: 28-Sep-2021 16:30				
Phenanthrene	0.223	0.001	0.010	ug/L	0.300		74.2	41-120			
Anthracene	0.223	0.001	0.010	ug/L	0.300		74.3	40-120			
Carbazole	0.240	0.001	0.010	ug/L	0.300		80.0	30-160			
Fluoranthene	0.240	0.002	0.010	ug/L	0.300		79.8	45-120			
Pyrene	0.239	0.001	0.010	ug/L	0.300		79.6	41-120			
Benzo(a)anthracene	0.242	0.0008	0.010	ug/L	0.300		80.6	42-120			
Chrysene	0.231	0.0009	0.010	ug/L	0.300		76.9	44-120			
Benzo(b)fluoranthene	0.232	0.0005	0.010	ug/L	0.300		77.4	44-120			
Benzo(k)fluoranthene	0.263	0.003	0.010	ug/L	0.300		87.7	50-120			
Benzo(j)fluoranthene	0.212	0.002	0.010	ug/L	0.300		70.8	39-160			
Benzofluoranthenes, Total	0.708	0.004	0.010	ug/L	0.900		78.6	46-120			
Benzo(a)pyrene	0.219	0.002	0.010	ug/L	0.300		73.1	35-120			
Perylene	0.206	0.006	0.010	ug/L	0.300		68.7	30-160			
Indeno(1,2,3-cd)pyrene	0.258	0.001	0.010	ug/L	0.300		85.9	37-120			
Dibenzo(a,h)anthracene	0.267	0.001	0.010	ug/L	0.300		88.9	34-120			Q
Benzo(g,h,i)perylene	0.235	0.001	0.010	ug/L	0.300		78.4	38-120			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.243			ug/L	0.300		81.1	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.304			ug/L	0.300		101	29-120			Q
<i>Surrogate: Fluoranthene-d10</i>	0.268			ug/L	0.300		89.4	57-120			
LCS Dup (BJI0190-BSD1)						Prepared: 08-Sep-2021	Analyzed: 28-Sep-2021 17:00				
Naphthalene	0.189	0.001	0.010	ug/L	0.300		63.2	37-120	15.00	30	
2-Methylnaphthalene	0.189	0.001	0.010	ug/L	0.300		62.9	37-120	15.50	30	
1-Methylnaphthalene	0.188	0.0009	0.010	ug/L	0.300		62.7	29-120	16.10	30	
Acenaphthylene	0.193	0.002	0.010	ug/L	0.300		64.3	41-120	16.60	30	
Acenaphthene	0.185	0.003	0.010	ug/L	0.300		61.6	41-120	15.30	30	
Dibenzofuran	0.182	0.002	0.010	ug/L	0.300		60.7	38-120	17.30	30	
Fluorene	0.198	0.002	0.010	ug/L	0.300		66.0	43-120	15.60	30	
Phenanthrene	0.188	0.001	0.010	ug/L	0.300		62.8	41-120	16.70	30	
Anthracene	0.183	0.001	0.010	ug/L	0.300		61.0	40-120	19.70	30	
Carbazole	0.197	0.001	0.010	ug/L	0.300		65.8	30-160	19.40	30	
Fluoranthene	0.202	0.002	0.010	ug/L	0.300		67.3	45-120	17.10	30	
Pyrene	0.201	0.001	0.010	ug/L	0.300		67.0	41-120	17.10	30	
Benzo(a)anthracene	0.198	0.0008	0.010	ug/L	0.300		66.1	42-120	19.80	30	
Chrysene	0.192	0.0009	0.010	ug/L	0.300		64.1	44-120	18.20	30	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0190 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJI0190-BSD1)						Prepared: 08-Sep-2021 Analyzed: 28-Sep-2021 17:00					
Benzo(b)fluoranthene	0.194	0.0005	0.010	ug/L	0.300		64.6	44-120	18.00	30	
Benzo(k)fluoranthene	0.221	0.003	0.010	ug/L	0.300		73.6	50-120	17.50	30	
Benzo(j)fluoranthene	0.180	0.002	0.010	ug/L	0.300		60.1	39-160	16.30	30	
Benzo(a)fluoranthene, Total	0.595	0.004	0.010	ug/L	0.900		66.1	46-120	17.30	30	
Benzo(a)pyrene	0.173	0.002	0.010	ug/L	0.300		57.8	35-120	23.40	30	
Perylene	0.156	0.006	0.010	ug/L	0.300		52.1	30-160	27.50	30	
Indeno(1,2,3-cd)pyrene	0.220	0.001	0.010	ug/L	0.300		73.2	37-120	16.00	30	
Dibenzo(a,h)anthracene	0.227	0.001	0.010	ug/L	0.300		75.5	34-120	16.20	30	Q
Benzo(g,h,i)perylene	0.203	0.001	0.010	ug/L	0.300		67.6	38-120	14.80	30	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.191			ug/L	0.300		63.8	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.231			ug/L	0.300		76.9	29-120			Q
<i>Surrogate: Fluoranthene-d10</i>	0.208			ug/L	0.300		69.4	57-120			



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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Petroleum Hydrocarbons - Quality Control

Batch BJI0192 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0192-BLK1)									
				Prepared: 08-Sep-2021 Analyzed: 22-Sep-2021 07:33					
Diesel Range Organics (C12-C24)	ND	0.100	mg/L						U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L						U
Surrogate: o-Terphenyl	0.230		mg/L	0.225	102	50-150			
LCS (BJI0192-BS1)									
				Prepared: 08-Sep-2021 Analyzed: 22-Sep-2021 07:53					
Diesel Range Organics (C12-C24)	3.22	0.100	mg/L	3.00	107	56-120			
Surrogate: o-Terphenyl	0.264		mg/L	0.225	118	50-150			
LCS Dup (BJI0192-BSD1)									
				Prepared: 08-Sep-2021 Analyzed: 22-Sep-2021 08:13					
Diesel Range Organics (C12-C24)	3.29	0.100	mg/L	3.00	110	56-120	2.09	30	
Surrogate: o-Terphenyl	0.261		mg/L	0.225	116	50-150			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

Aroclor PCB - Quality Control
Batch BJI0191 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0191-BLK1)											
						Prepared: 08-Sep-2021 Analyzed: 25-Sep-2021 15:47					
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0122			ug/L	0.0200		60.8	29-120			
Surrogate: Tetrachlorometaxylene	0.0139			ug/L	0.0200		69.5	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0115			ug/L	0.0200		57.4	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0128			ug/L	0.0200		64.1	32-120			
LCS (BJI0191-BS1)											
						Prepared: 08-Sep-2021 Analyzed: 25-Sep-2021 16:07					
Aroclor 1016 [2C]	0.037	0.002	0.010	ug/L	0.0500		73.8	54-120			
Aroclor 1260 [2C]	0.035	0.003	0.010	ug/L	0.0500		69.8	51-128			
Surrogate: Decachlorobiphenyl	0.0121			ug/L	0.0200		60.4	29-120			
Surrogate: Tetrachlorometaxylene	0.0124			ug/L	0.0200		62.2	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0110			ug/L	0.0200		55.1	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0118			ug/L	0.0200		59.1	32-120			
LCS Dup (BJI0191-BSD1)											
						Prepared: 08-Sep-2021 Analyzed: 25-Sep-2021 16:28					
Aroclor 1016 [2C]	0.034	0.002	0.010	ug/L	0.0500		68.6	54-120	7.26	30	
Aroclor 1260 [2C]	0.033	0.003	0.010	ug/L	0.0500		65.0	51-128	7.08	30	
Surrogate: Decachlorobiphenyl	0.0108			ug/L	0.0200		53.9	29-120			
Surrogate: Tetrachlorometaxylene	0.0116			ug/L	0.0200		57.8	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0103			ug/L	0.0200		51.4	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0106			ug/L	0.0200		52.8	32-120			



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Metals and Metallic Compounds - Quality Control

Batch BJI0293 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0293-BLK1)						Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:41					
Mercury	0.000032	0.000013	0.000100	mg/L							J
LCS (BJI0293-BS1)						Prepared: 10-Sep-2021 Analyzed: 14-Sep-2021 13:44					
Mercury	0.00175	0.000013	0.000100	mg/L	0.00200		87.5	80-120			


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Reported:
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Metals and Metallic Compounds - Quality Control
Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0423-BLK1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:28						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Manganese	55	ND	0.142	0.500	ug/L							U
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.179	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U
LCS (BJI0423-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:32						
Barium	135	25.2	0.114	0.500	ug/L	25.0		101	80-120			
Barium	137	25.3	0.0765	0.500	ug/L	25.0		101	80-120			
Chromium	52	25.3	0.260	0.500	ug/L	25.0		101	80-120			
Chromium	53	25.9	0.239	0.500	ug/L	25.0		103	80-120			
Iron	54	4930	18.2	36.0	ug/L	5000		98.7	80-120			
Iron	57	4620	6.63	36.0	ug/L	5000		92.4	80-120			
Manganese	55	25.4	0.142	0.500	ug/L	25.0		101	80-120			
Silver	107	23.6	0.0220	0.200	ug/L	25.0		94.3	80-120			
Vanadium	51a	24.9	0.0556	0.200	ug/L	25.0		99.5	80-120			
Vanadium	51b	25.1	0.0521	0.200	ug/L	25.0		100	80-120			
Arsenic	75a	24.6	0.0373	0.200	ug/L	25.0		98.3	80-120			
Cadmium	111	24.3	0.0300	0.100	ug/L	25.0		97.2	80-120			



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Metals and Metallic Compounds - Quality Control

Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0423-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:32						
Cadmium	114	23.7	0.0400	0.100	ug/L	25.0		94.9	80-120			
Cobalt	59	23.6	0.0178	0.200	ug/L	25.0		94.5	80-120			
Copper	63	23.3	0.173	0.500	ug/L	25.0		93.4	80-120			
Copper	65	23.3	0.350	0.500	ug/L	25.0		93.2	80-120			
Nickel	60	23.5	0.0792	0.500	ug/L	25.0		94.1	80-120			
Nickel	62	23.5	0.220	0.500	ug/L	25.0		94.1	80-120			
Selenium	78	76.3	0.179	0.500	ug/L	80.0		95.4	80-120			
Zinc	66	72.9	2.92	6.00	ug/L	80.0		91.1	80-120			
Zinc	67	75.1	0.940	6.00	ug/L	80.0		93.8	80-120			

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0423-BLK2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:27						
Lead	208	ND	0.0513	0.100	ug/L							U
LCS (BJI0423-BS2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:31						
Lead	208	26.0	0.0513	0.100	ug/L	25.0		104	80-120			



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0349 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0349-BLK1)						Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:24					
Mercury, Dissolved	0.000027	0.000013	0.000100	mg/L							J
LCS (BJI0349-BS1)						Prepared: 13-Sep-2021 Analyzed: 14-Sep-2021 15:26					
Mercury, Dissolved	0.00175	0.000013	0.000100	mg/L	0.00200		87.6	80-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0383 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0383-BLK1)						Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 15:54					
Mercury, Dissolved	0.000028	0.000013	0.000100	mg/L							J
LCS (BJI0383-BS1)						Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 16:01					
Mercury, Dissolved	0.00174	0.000013	0.000100	mg/L	0.00200		87.2	80-120			
Duplicate (BJI0383-DUP1)						Source: 21I0012-13 Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 16:06					
Mercury, Dissolved	0.000030	0.000013	0.000100	mg/L		0.000020			37.10	20	L, J
Matrix Spike (BJI0383-MS1)						Source: 21I0012-13 Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 16:08					
Mercury, Dissolved	0.000904	0.000013	0.000100	mg/L	0.00100	0.000020	88.3	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJI0383-MSD1)						Source: 21I0012-13 Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 16:10					
Mercury, Dissolved	0.000862	0.000013	0.000100	mg/L	0.00100	0.000020	84.2	75-125	4.68	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0419 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0419-BLK1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:19						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	6.63	20.0	ug/L							U
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
LCS (BJI0419-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:23						
Barium, Dissolved	135	25.1	0.114	0.500	ug/L	25.0		100	80-120			
Barium, Dissolved	137	25.0	0.0765	0.500	ug/L	25.0		100	80-120			
Chromium, Dissolved	52	25.6	0.260	0.500	ug/L	25.0		103	80-120			
Chromium, Dissolved	53	26.0	0.239	0.500	ug/L	25.0		104	80-120			
Iron, Dissolved	54	5060	18.2	36.0	ug/L	5000		101	80-120			
Iron, Dissolved	57	4720	6.63	20.0	ug/L	5000		94.5	80-120			
Manganese, Dissolved	55	25.4	0.142	0.500	ug/L	25.0		102	80-120			
Silver, Dissolved	107	23.5	0.0220	0.200	ug/L	25.0		94.0	80-120			
Vanadium, Dissolved	51a	25.0	0.0556	0.200	ug/L	25.0		100	80-120			
Vanadium, Dissolved	51b	25.2	0.0521	0.200	ug/L	25.0		101	80-120			
Arsenic, Dissolved	75a	23.6	0.0373	0.200	ug/L	25.0		94.4	80-120			
Cadmium, Dissolved	111	24.0	0.0300	0.100	ug/L	25.0		96.0	80-120			
Cadmium, Dissolved	114	23.6	0.0400	0.100	ug/L	25.0		94.3	80-120			
Cobalt, Dissolved	59	23.7	0.0178	0.200	ug/L	25.0		94.9	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0419 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0419-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:23						
Nickel, Dissolved	60	23.4	0.0792	0.500	ug/L	25.0		93.5	80-120			
Nickel, Dissolved	62	22.9	0.220	0.500	ug/L	25.0		91.6	80-120			
Selenium, Dissolved	78	72.3	0.179	0.500	ug/L	80.0		90.4	80-120			
Zinc, Dissolved	66	70.4	2.92	6.00	ug/L	80.0		88.0	80-120			
Zinc, Dissolved	67	70.1	0.940	6.00	ug/L	80.0		87.6	80-120			

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0419-BLK2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:17						
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
LCS (BJI0419-BS2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:22						
Lead, Dissolved	208	25.5	0.0513	0.100	ug/L	25.0		102	80-120			
Copper, Dissolved	63	27.0	0.173	0.500	ug/L	25.0		108	80-120			
Copper, Dissolved	65	26.3	0.350	0.500	ug/L	25.0		105	80-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0460 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0460-BLK1)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 18:03						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Manganese, Dissolved	55	0.234	0.142	0.500	ug/L							J
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
Blank (BJI0460-BLK2)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 20:19						
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	6.63	20.0	ug/L							U
LCS (BJI0460-BS1)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 18:07						
Barium, Dissolved	135	24.0	0.114	0.500	ug/L	25.0		96.1	80-120			
Barium, Dissolved	137	24.2	0.0765	0.500	ug/L	25.0		96.7	80-120			
Chromium, Dissolved	52	24.7	0.260	0.500	ug/L	25.0		99.0	80-120			
Chromium, Dissolved	53	24.7	0.239	0.500	ug/L	25.0		98.7	80-120			
Iron, Dissolved	54	5120	18.2	36.0	ug/L	5000		102	80-120			
Iron, Dissolved	57	4810	6.63	20.0	ug/L	5000		96.2	80-120			
Lead, Dissolved	208	24.3	0.0513	0.100	ug/L	25.0		97.0	80-120			
Manganese, Dissolved	55	24.8	0.142	0.500	ug/L	25.0		99.1	80-120			
Silver, Dissolved	107	24.6	0.0220	0.200	ug/L	25.0		98.4	80-120			


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Reported:
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Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJI0460 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0460-BS1)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 18:07						
Vanadium, Dissolved	51a	24.5	0.0556	0.200	ug/L	25.0		97.8	80-120			
Vanadium, Dissolved	51b	24.4	0.0521	0.200	ug/L	25.0		97.8	80-120			
Arsenic, Dissolved	75a	23.3	0.0373	0.200	ug/L	25.0		93.4	80-120			
Cadmium, Dissolved	111	24.7	0.0300	0.100	ug/L	25.0		98.9	80-120			
Cadmium, Dissolved	114	24.2	0.0400	0.100	ug/L	25.0		96.9	80-120			
Cobalt, Dissolved	59	24.2	0.0178	0.200	ug/L	25.0		96.9	80-120			
Copper, Dissolved	63	24.0	0.173	0.500	ug/L	25.0		96.0	80-120			
Copper, Dissolved	65	24.2	0.350	0.500	ug/L	25.0		96.6	80-120			
Nickel, Dissolved	60	24.1	0.0792	0.500	ug/L	25.0		96.3	80-120			
Nickel, Dissolved	62	23.9	0.220	0.500	ug/L	25.0		95.7	80-120			
Selenium, Dissolved	78	70.6	0.179	0.500	ug/L	80.0		88.3	80-120			
Zinc, Dissolved	66	71.9	2.92	6.00	ug/L	80.0		89.9	80-120			
Zinc, Dissolved	67	69.4	0.940	6.00	ug/L	80.0		86.7	80-120			
Duplicate (BJI0460-DUP1)						Source: 2110012-04 Prepared: 16-Sep-2021 Analyzed: 17-Sep-2021 01:26						
Barium, Dissolved	135	4.79	0.114	0.500	ug/L	4.54				5.27	20	
Chromium, Dissolved	52	ND	0.260	0.500	ug/L	ND						U
Iron, Dissolved	57	3060	6.63	20.0	ug/L	2980				2.41	20	
Lead, Dissolved	208	ND	0.0513	0.100	ug/L	ND						U
Manganese, Dissolved	55	118	0.142	0.500	ug/L	112				5.10	20	
Silver, Dissolved	107	ND	0.0220	0.200	ug/L	ND						U
Vanadium, Dissolved	51a	1.10	0.0556	0.200	ug/L	1.06				3.70	20	
Arsenic, Dissolved	75a	0.384	0.0373	0.200	ug/L	0.376				2.11	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L	ND						U
Cobalt, Dissolved	59	0.482	0.0178	0.200	ug/L	0.460				4.67	20	
Copper, Dissolved	63	ND	0.173	0.500	ug/L	ND						U
Nickel, Dissolved	60	2.49	0.0792	0.500	ug/L	2.24				10.50	20	
Selenium, Dissolved	78	ND	0.179	0.500	ug/L	ND						U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L	ND						U
Matrix Spike (BJI0460-MS1)						Source: 2110012-04 Prepared: 16-Sep-2021 Analyzed: 17-Sep-2021 01:31						
Barium, Dissolved	135	30.3	0.114	0.500	ug/L	25.0	4.54	103	75-125			
Chromium, Dissolved	52	20.3	0.260	0.500	ug/L	25.0	ND	81.4	75-125			
Iron, Dissolved	57	7570	6.63	20.0	ug/L	5000	2980	91.7	75-125			
Lead, Dissolved	208	24.4	0.0513	0.100	ug/L	25.0	ND	97.7	75-125			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0460 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJI0460-MS1)		Source: 21I0012-04			Prepared: 16-Sep-2021 Analyzed: 17-Sep-2021 01:31							
Manganese, Dissolved	55	136	0.142	0.500	ug/L	25.0	112	93.8	75-125			HC
Silver, Dissolved	107	23.0	0.0220	0.200	ug/L	25.0	ND	92.1	75-125			
Vanadium, Dissolved	51a	21.9	0.0556	0.200	ug/L	25.0	1.06	83.2	75-125			
Arsenic, Dissolved	75a	24.9	0.0373	0.200	ug/L	25.0	0.376	98.2	75-125			
Cadmium, Dissolved	111	23.5	0.0300	0.100	ug/L	25.0	ND	94.1	75-125			
Cobalt, Dissolved	59	25.9	0.0178	0.200	ug/L	25.0	0.460	102	75-125			
Copper, Dissolved	63	24.8	0.173	0.500	ug/L	25.0	ND	99.1	75-125			
Nickel, Dissolved	60	27.2	0.0792	0.500	ug/L	25.0	2.24	100	75-125			
Selenium, Dissolved	78	70.6	0.179	0.500	ug/L	80.0	ND	88.2	75-125			
Zinc, Dissolved	66	71.5	2.92	6.00	ug/L	80.0	ND	89.4	75-125			

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

Matrix Spike Dup (BJI0460-MSD1)		Source: 21I0012-04			Prepared: 16-Sep-2021 Analyzed: 17-Sep-2021 01:36							
Barium, Dissolved	135	29.0	0.114	0.500	ug/L	25.0	4.54	97.8	75-125	4.28	20	
Chromium, Dissolved	52	19.7	0.260	0.500	ug/L	25.0	ND	78.9	75-125	3.09	20	
Iron, Dissolved	57	7440	6.63	20.0	ug/L	5000	2980	89.1	75-125	1.75	20	
Lead, Dissolved	208	23.6	0.0513	0.100	ug/L	25.0	ND	94.2	75-125	3.66	20	
Manganese, Dissolved	55	130	0.142	0.500	ug/L	25.0	112	69.6	75-125	4.56	20	HC
Silver, Dissolved	107	22.2	0.0220	0.200	ug/L	25.0	ND	88.9	75-125	3.61	20	
Vanadium, Dissolved	51a	21.0	0.0556	0.200	ug/L	25.0	1.06	79.8	75-125	4.04	20	
Arsenic, Dissolved	75a	24.0	0.0373	0.200	ug/L	25.0	0.376	94.5	75-125	3.83	20	
Cadmium, Dissolved	111	22.6	0.0300	0.100	ug/L	25.0	ND	90.3	75-125	4.12	20	
Cobalt, Dissolved	59	25.0	0.0178	0.200	ug/L	25.0	0.460	98.2	75-125	3.51	20	
Copper, Dissolved	63	23.9	0.173	0.500	ug/L	25.0	ND	95.8	75-125	3.41	20	
Nickel, Dissolved	60	26.6	0.0792	0.500	ug/L	25.0	2.24	97.4	75-125	2.36	20	
Selenium, Dissolved	78	68.6	0.179	0.500	ug/L	80.0	ND	85.7	75-125	2.89	20	
Zinc, Dissolved	66	69.3	2.92	6.00	ug/L	80.0	ND	86.6	75-125	3.23	20	

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



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Wet Chemistry - Quality Control

Batch BJI0038 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0038-BLK1)						Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:03					
Ferrous Iron	ND	0.040	0.040	mg/L							U
LCS (BJI0038-BS1)						Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:04					
Ferrous Iron	0.507	0.040	0.040	mg/L	0.500		101	90-110			
Duplicate (BJI0038-DUP2)						Source: 21I0012-01RE1 Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:22					
Ferrous Iron	59.2	2.00	2.00	mg/L		59.0			0.34	20	D
Matrix Spike (BJI0038-MS2)						Source: 21I0012-01RE1 Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:22					
Ferrous Iron	74.3	2.00	2.00	mg/L	20.0	59.0	76.3	75-125			D

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



Analytical Resources, Incorporated
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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Wet Chemistry - Quality Control

Batch BJI0040 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0040-BLK1)										
						Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:07				
Sulfite	ND	1.4	1.4	mg/L						U
LCS (BJI0040-BS1)										
						Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:07				
Sulfite	4.6	1.4	1.4	mg/L	4.97		92.6 75-100			
Duplicate (BJI0040-DUP1)										
				Source: 21I0012-01		Prepared: 01-Sep-2021 Analyzed: 01-Sep-2021 17:07				
Sulfite	ND	1.4	1.4	mg/L		ND				H, U


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 Project: Lower Duwamish Q3
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 Project Manager: Meg Strong

Reported:
 05-Oct-2021 11:51

Wet Chemistry - Quality Control
Batch BJI0086 - No Prep Wet Chem

Instrument: IC930 Analyst: CDE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0086-BLK1) Prepared: 02-Sep-2021 Analyzed: 02-Sep-2021 17:16											
Chloride	ND	0.100	0.100	mg/L							U
Nitrate-N	ND	0.100	0.100	mg/L							U
Nitrite-N	ND	0.100	0.100	mg/L							U
Blank (BJI0086-BLK3) Prepared: 02-Sep-2021 Analyzed: 10-Sep-2021 23:28											
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BJI0086-BS1) Prepared: 02-Sep-2021 Analyzed: 02-Sep-2021 17:36											
Chloride	4.67	0.100	0.100	mg/L	5.00		93.3	90-110			
Nitrate-N	4.53	0.100	0.100	mg/L	5.00		90.6	90-110			
Nitrite-N	5.24	0.100	0.100	mg/L	5.00		105	90-110			
Sulfate	5.05	0.100	0.100	mg/L	5.00		101	90-110			
Duplicate (BJI0086-DUP1) Source: 21I0012-01 Prepared: 02-Sep-2021 Analyzed: 02-Sep-2021 18:16											
Nitrate-N	ND	0.100	0.100	mg/L		ND					U
Nitrite-N	ND	0.100	0.100	mg/L		ND					U
Duplicate (BJI0086-DUP4) Source: 21I0012-01RE3 Prepared: 02-Sep-2021 Analyzed: 23-Sep-2021 18:18											
Chloride	10.3	0.500	0.500	mg/L		10.4			0.88	20	D
Sulfate	ND	0.500	0.500	mg/L		ND					U
Matrix Spike (BJI0086-MS1) Source: 21I0012-01 Prepared: 02-Sep-2021 Analyzed: 02-Sep-2021 18:36											
Nitrate-N	1.91	0.100	0.100	mg/L	2.00	ND	95.4	75-125			
Nitrite-N	1.55	0.100	0.100	mg/L	2.01	ND	77.1	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike (BJI0086-MS3) Source: 21I0012-01RE3 Prepared: 02-Sep-2021 Analyzed: 11-Sep-2021 01:28											
Sulfate	2.27	0.100	0.100	mg/L	2.00	ND	94.3	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike (BJI0086-MS4) Source: 21I0012-01RE3 Prepared: 02-Sep-2021 Analyzed: 23-Sep-2021 18:38											
Chloride	19.5	0.500	0.500	mg/L	10.0	10.4	90.9	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



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05-Oct-2021 11:51

Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 300.0 in Water</i>	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrate-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
<i>EPA 6020B in Water</i>	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
<i>EPA 6020B UCT-KED in Water</i>	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP



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05-Oct-2021 11:51

Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC



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Seattle WA, 98103-8636

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EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE



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Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE



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1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

EPA 8270E in Water

Phenol	NELAP,DoD-ELAP
bis(2-chloroethyl) ether	NELAP,DoD-ELAP
2-Chlorophenol	NELAP,DoD-ELAP
1,3-Dichlorobenzene	NELAP,DoD-ELAP
1,4-Dichlorobenzene	NELAP,DoD-ELAP
1,2-Dichlorobenzene	NELAP,DoD-ELAP
Benzyl Alcohol	NELAP,DoD-ELAP
2,2'-Oxybis(1-chloropropane)	NELAP,DoD-ELAP
2-Methylphenol	NELAP,DoD-ELAP
Hexachloroethane	NELAP,DoD-ELAP
N-Nitroso-di-n-Propylamine	NELAP,DoD-ELAP
4-Methylphenol	NELAP,DoD-ELAP
Nitrobenzene	NELAP,DoD-ELAP
Isophorone	NELAP,DoD-ELAP
2-Nitrophenol	NELAP,DoD-ELAP
2,4-Dimethylphenol	NELAP,DoD-ELAP
Bis(2-Chloroethoxy)methane	NELAP,DoD-ELAP
2,4-Dichlorophenol	NELAP,DoD-ELAP
1,2,4-Trichlorobenzene	NELAP,DoD-ELAP
Naphthalene	NELAP,DoD-ELAP
Benzoic acid	NELAP,DoD-ELAP
4-Chloroaniline	NELAP,DoD-ELAP
Hexachlorobutadiene	NELAP,DoD-ELAP
4-Chloro-3-Methylphenol	NELAP,DoD-ELAP
2-Methylnaphthalene	NELAP,DoD-ELAP
Hexachlorocyclopentadiene	NELAP,DoD-ELAP
2,4,6-Trichlorophenol	NELAP,DoD-ELAP
2,4,5-Trichlorophenol	NELAP,DoD-ELAP
2-Chloronaphthalene	NELAP,DoD-ELAP
2-Nitroaniline	NELAP,DoD-ELAP



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Acenaphthylene	NELAP,DoD-ELAP
Dimethylphthalate	NELAP,DoD-ELAP
2,6-Dinitrotoluene	NELAP,DoD-ELAP
Acenaphthene	NELAP,DoD-ELAP
3-Nitroaniline	NELAP,DoD-ELAP
2,4-Dinitrophenol	NELAP,DoD-ELAP
Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzofluoranthenes, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP



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EPA 8270E-SIM in Water

Naphthalene	ADEC, DoD-ELAP, NELAP, WADOE
2-Methylnaphthalene	ADEC, DoD-ELAP, NELAP
1-Methylnaphthalene	ADEC, DoD-ELAP, NELAP, WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC, DoD-ELAP, NELAP, WADOE
Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

EPA RSK-175 in Water

Methane	NELAP
Ethane	NELAP
Ethene	NELAP
Acetylene	NELAP

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP


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Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

SM 3500-Fe B-97 in Water

Ferrous Iron	WADOE,NELAP
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SM 4500-SO3 B-00 in Water

Sulfite	WADOE,NELAP
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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 11:51

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
H	Hold time violation - Hold time was exceeded.
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
NRS	This surrogate not reported due to chromatographic interference
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ drift or minimum RRF)
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.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

05 October 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q3

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.

Associated Work Order(s)
2110040

Associated SDG ID(s)
N/A

Shelly
Fishel

Digitally signed by
Shelly Fishel
Date: 2021.10.05
18:12:04 -07'00'

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 enclose 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.

A handwritten signature in blue ink that reads "Shelly Fishel".

Shelly Fishel, Project Manager

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: 2170040		Turn-around Requested: Standard		Page: 1 of 1	
ARI Client Company: Shannon & Wilson, Inc.		Phone:		Date: 9/2/21	Ice Present?
Client Contact: Shaoshana Howard		No. of Coolers:		Cooler Temps: 2.2; 4.2; 5.6	
Client Project Name: LDW		Analysis Requested			
Client Project #: 21-1-12596		Samplers: CTC, xxx			
Sample ID	Date	Time	Matrix	No. Containers	Notes/Comments
MW-14-20210902	9/2	0935	GW	2	⊗ As, Ba, Cr, Mn, Ni Cd, Co, Cu, Fe, Pb, Hg, Se, Ag, V, Zn. ① As, Mn, Ni, Cu, Hg, Zn
EB-3-20210209	9/2	0955	W	6	② As, Cu
MW-37-20210209	9/2	1055	GW	13	
MW-6-20210209	9/2	1150	GW	13	
MW-65-20210209	9/2	1255	GW	17	
TB-13-20210209	9/2	1340	W	5	
MW-74-20210209	9/2	1430	GW	13	
MW-61-20210209	9/2	1555	GW	13	
Relinquished by: (Signature) <i>Christian Cantfield</i> Printed Name: Christian Cantfield Company: SLWI Date & Time: 9/2/2021 1645 Received by: (Signature) <i>Dimitri Lomhadze</i> Printed Name: Dimitri Lomhadze Company: ARI Date & Time: 09/02/21 1655					



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
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 www.arilabs.com

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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

RE: LDW Q3 Receiving Documentation 21I0040

Shoshana Howard <SKH@shanwil.com>

Fri 9/3/2021 11:26 AM

To: Shelly Fishel <shelly.fishel@arilabs.com>

Hi Shelly,

Log-in looks good except one thing. Can you please remove mercury from the metals list (total and dissolved) for the MW-37 sample and add selenium in its place? The field team mis-read the sample schedule and put the wrong one in the list.

Thanks!

Shoshana

Shoshana Howard, PE | Senior Engineer

400 N. 34th St., Suite 100

Seattle, WA 98103-8636

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Phone: (206) 632-8020 Fax: (206) 695-6777

Direct: (206) 695-6811 skh@shanwil.com

From: Shelly Fishel <shelly.fishel@arilabs.com>

Sent: Friday, September 3, 2021 10:11 AM

To: Shoshana Howard <SKH@shanwil.com>

Subject: LDW Q3 Receiving Documentation 21I0040

Hello Shoshana,

ARI received six monitoring well samples, an equipment blank and a trip blank which were logged in under work order 21I0040. The samples were intact and within temperature compliance. Receiving documentation is attached. Please review for accuracy. Have a wonderful day!

Be safe and stay healthy!

Regards,

Shelly Fishel

Project Manager

Analytical Resources, Inc.

4611 S. 134th Place, Suite 100

Tukwila, WA 98168-3240

Website: <https://www.arilabs.com>

Direct Phone: 206-695-6210



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-14-20210902	21I0040-01	Water	02-Sep-2021 09:35	02-Sep-2021 16:55
EB-3-20210209	21I0040-02	Water	02-Sep-2021 09:55	02-Sep-2021 16:55
EB-3-20210209	21I0040-03	Water	02-Sep-2021 09:55	02-Sep-2021 16:55
MW-37-20210209	21I0040-04	Water	02-Sep-2021 10:55	02-Sep-2021 16:55
MW-37-20210209	21I0040-05	Water	02-Sep-2021 10:55	02-Sep-2021 16:55
MW-6-20210209	21I0040-06	Water	02-Sep-2021 11:50	02-Sep-2021 16:55
MW-6-20210209	21I0040-07	Water	02-Sep-2021 11:50	02-Sep-2021 16:55
MW-65-20210209	21I0040-08	Water	02-Sep-2021 12:55	02-Sep-2021 16:55
MW-65-20210209	21I0040-09	Water	02-Sep-2021 12:55	02-Sep-2021 16:55
TB-13-20210209	21I0040-10	Water	02-Sep-2021 09:35	02-Sep-2021 16:55
MW-74-20210209	21I0040-11	Water	02-Sep-2021 14:30	02-Sep-2021 16:55
MW-74-20210209	21I0040-12	Water	02-Sep-2021 14:30	02-Sep-2021 16:55
MW-61-20210209	21I0040-13	Water	02-Sep-2021 15:55	02-Sep-2021 16:55
MW-61-20210209	21I0040-14	Water	02-Sep-2021 15:55	02-Sep-2021 16:55



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q3
Work Order: 2110040

Sample receipt

Samples as listed on the preceding page were received 02-Sep-2021 16:55 under ARI work order 2110040. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Surrogate Phenol-d5 which was out of control low in samples 2110040-01 and 2110040-02 and have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits except Benzoic Acid which was out of control low in the blank spike duplicate (BJI0254-BSD1) and has been flagged.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Total Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21I0040-02 in Total Mercury batch BJI0424. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.



WORK ORDER

21I0040

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21I0040-01 A	Glass NM, Amber, 500 mL		
21I0040-01 B	Glass NM, Amber, 500 mL		
21I0040-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21I0040-02 B	Glass NM, Amber, 1000 mL		
21I0040-02 C	Glass NM, Amber, 1000 mL		
21I0040-02 D	Glass NM, Amber, 500 mL		
21I0040-02 E	Glass NM, Amber, 500 mL		
21I0040-03 A	HDPE NM, 500 mL	>2	Fail
21I0040-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21I0040-04 B	Glass NM, Amber, 500 mL		
21I0040-04 C	Glass NM, Amber, 500 mL		
21I0040-04 D	Glass NM, Amber, 500 mL		
21I0040-04 E	Glass NM, Amber, 500 mL		
21I0040-04 F	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 G	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 H	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 I	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-05 A	HDPE NM, 500 mL	>2	Fail
21I0040-06 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21I0040-06 B	Glass NM, Amber, 1000 mL		
21I0040-06 C	Glass NM, Amber, 1000 mL		
21I0040-06 D	Glass NM, Amber, 500 mL		
21I0040-06 E	Glass NM, Amber, 500 mL		
21I0040-06 F	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 G	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 H	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 I	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-07 A	HDPE NM, 500 mL	>2	Fail
21I0040-08 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass



WORK ORDER

21I0040

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0040-08 B	Glass NM, Amber, 1000 mL		
21I0040-08 C	Glass NM, Amber, 1000 mL		
21I0040-08 D	Glass NM, Amber, 500 mL		
21I0040-08 E	Glass NM, Amber, 500 mL		
21I0040-08 F	Glass NM, Amber, 500 mL		
21I0040-08 G	Glass NM, Amber, 500 mL		
21I0040-08 H	Glass NM, Amber, 500 mL		
21I0040-08 I	Glass NM, Amber, 500 mL		
21I0040-08 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 M	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 N	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 O	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 P	VOA Vial, Clear, 40 mL, HCL		
21I0040-09 A	HDPE NM, 500 mL	72	Fail
21I0040-10 A	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 B	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 C	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 D	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 E	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 A	HDPE NM, 500 mL, 1:1 HNO3	52	Pass
21I0040-11 B	Glass NM, Amber, 1000 mL		
21I0040-11 C	Glass NM, Amber, 1000 mL		
21I0040-11 D	Glass NM, Amber, 500 mL		
21I0040-11 E	Glass NM, Amber, 500 mL		
21I0040-11 F	Glass NM, Amber, 500 mL		
21I0040-11 G	Glass NM, Amber, 500 mL		
21I0040-11 H	Glass NM, Amber, 500 mL		
21I0040-11 I	Glass NM, Amber, 500 mL		
21I0040-11 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 M	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 N	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 O	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 P	VOA Vial, Clear, 40 mL, HCL		



WORK ORDER

21I0040

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0040-12 A	HDPE NM, 500 mL	22	Fail
21I0040-13 A	HDPE NM, 500 mL, 1:1 HNO3	22	Pass
21I0040-13 B	Glass NM, Amber, 1000 mL		
21I0040-13 C	Glass NM, Amber, 1000 mL		
21I0040-13 D	Glass NM, Amber, 500 mL		
21I0040-13 E	Glass NM, Amber, 500 mL		
21I0040-13 F	Glass NM, Amber, 500 mL		
21I0040-13 G	Glass NM, Amber, 500 mL		
21I0040-13 H	Glass NM, Amber, 500 mL		
21I0040-13 I	Glass NM, Amber, 500 mL		
21I0040-13 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 M	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 N	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 O	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 P	VOA Vial, Clear, 40 mL, HCL		
21I0040-14 A	HDPE NM, 500 mL	22	Fail

JSW
Preservation Confirmed By

09/03/2021
Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: LDL

COC No(s): _____ NA

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

Assigned ARI Job No: 2170040

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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 1655

2.2 4.2 5.6

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 506

Cooler Accepted by: DC Date: 09/03/2001 Time: 1655

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

How were bottles sealed in plastic bags? _____

Individually Grouped Not

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? _____

ISW YES NO

Date VOC Trip Blank was made at ARI: _____

NA 09/03/2001

Were the sample(s) split by ARI? NA

YES _____ Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: ISW Date: 09/03/2001 Time: 0726 Labels checked by: ISW

**** 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: _____



WORK ORDER

21I0040

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21I0040-01 A	Glass NM, Amber, 500 mL		
21I0040-01 B	Glass NM, Amber, 500 mL		
21I0040-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21I0040-02 B	Glass NM, Amber, 1000 mL		
21I0040-02 C	Glass NM, Amber, 1000 mL		
21I0040-02 D	Glass NM, Amber, 500 mL		
21I0040-02 E	Glass NM, Amber, 500 mL		
21I0040-03 A	HDPE NM, 500 mL	>2	Fail ①
21I0040-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21I0040-04 B	Glass NM, Amber, 500 mL		
21I0040-04 C	Glass NM, Amber, 500 mL		
21I0040-04 D	Glass NM, Amber, 500 mL		
21I0040-04 E	Glass NM, Amber, 500 mL		
21I0040-04 F	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 G	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 H	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 I	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-04 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-05 A	HDPE NM, 500 mL	>2	Fail ①
21I0040-06 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21I0040-06 B	Glass NM, Amber, 1000 mL		
21I0040-06 C	Glass NM, Amber, 1000 mL		
21I0040-06 D	Glass NM, Amber, 500 mL		
21I0040-06 E	Glass NM, Amber, 500 mL		
21I0040-06 F	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 G	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 H	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 I	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-06 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-07 A	HDPE NM, 500 mL	>2	Fail ①
21I0040-08 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass



WORK ORDER

21I0040

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0040-08 B	Glass NM, Amber, 1000 mL		
21I0040-08 C	Glass NM, Amber, 1000 mL		
21I0040-08 D	Glass NM, Amber, 500 mL		
21I0040-08 E	Glass NM, Amber, 500 mL		
21I0040-08 F	Glass NM, Amber, 500 mL		
21I0040-08 G	Glass NM, Amber, 500 mL		
21I0040-08 H	Glass NM, Amber, 500 mL		
21I0040-08 I	Glass NM, Amber, 500 mL		
21I0040-08 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 M	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 N	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 O	VOA Vial, Clear, 40 mL, HCL		
21I0040-08 P	VOA Vial, Clear, 40 mL, HCL		
21I0040-09 A	HDPE NM, 500 mL	72	Fail (1)
21I0040-10 A	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 B	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 C	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 D	VOA Vial, Clear, 40 mL, HCL		
21I0040-10 E	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 A	HDPE NM, 500 mL, 1:1 HNO3	52	Pass
21I0040-11 B	Glass NM, Amber, 1000 mL		
21I0040-11 C	Glass NM, Amber, 1000 mL		
21I0040-11 D	Glass NM, Amber, 500 mL		
21I0040-11 E	Glass NM, Amber, 500 mL		
21I0040-11 F	Glass NM, Amber, 500 mL		
21I0040-11 G	Glass NM, Amber, 500 mL		
21I0040-11 H	Glass NM, Amber, 500 mL		
21I0040-11 I	Glass NM, Amber, 500 mL		
21I0040-11 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 M	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 N	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 O	VOA Vial, Clear, 40 mL, HCL		
21I0040-11 P	VOA Vial, Clear, 40 mL, HCL		



WORK ORDER

21I0040

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21I0040-12 A	HDPE NM, 500 mL	72	Fail ①
21I0040-13 A	HDPE NM, 500 mL, 1:1 HNO ₃	72	Pass
21I0040-13 B	Glass NM, Amber, 1000 mL		
21I0040-13 C	Glass NM, Amber, 1000 mL		
21I0040-13 D	Glass NM, Amber, 500 mL		
21I0040-13 E	Glass NM, Amber, 500 mL		
21I0040-13 F	Glass NM, Amber, 500 mL		
21I0040-13 G	Glass NM, Amber, 500 mL		
21I0040-13 H	Glass NM, Amber, 500 mL		
21I0040-13 I	Glass NM, Amber, 500 mL		
21I0040-13 J	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 K	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 L	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 M	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 N	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 O	VOA Vial, Clear, 40 mL, HCL		
21I0040-13 P	VOA Vial, Clear, 40 mL, HCL		
21I0040-14 A	HDPE NM, 500 mL	72	Fail ①

3/1

Preservation Confirmed By

Date

09/07/2021 ① Filtered at 0.45 um
and preserved with 0.75ml conc. HNO₃ (J7647).
m109/06121



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-14-20210902

21I0040-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/02/2021 09:35

Instrument: NT14 Analyst: VTS

Analyzed: 09/28/2021 15:16

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-01 A 01

Preparation Batch: BJI0254

Sample Size: 1000 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	48.1	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	27.2	%	*
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	72.4	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	62.1	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	74.5	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	72.8	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	76.1	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	82.0	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-02 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E
Instrument: NT14 Analyst: VTS

Sampled: 09/02/2021 09:55

Analyzed: 09/28/2021 15:52

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0254
Prepared: 09/09/2021

Sample Size: 1000 mL
Final Volume: 1 mL

Extract ID: 21I0040-02 C 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	47.3	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	27.1	%	*
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	74.6	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	66.7	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	79.0	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	77.9	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	84.5	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	89.1	%	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209 21I0040-02 (Water)

Aroclor PCB

Method: EPA 8082A			Sampled: 09/02/2021 09:55	
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 19:12	
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0040-02 B 01	
	Preparation Batch: BJI0252	Sample Size: 1000 mL		
	Prepared: 09/09/2021	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0040-02 B 01	
	Cleanup Batch: CJI0207	Initial Volume: 0.5 mL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID: 21I0040-02 B 01	
	Cleanup Batch: CJI0205	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID: 21I0040-02 B 01	
	Cleanup Batch: CJI0206	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				29-120 %	43.9	%	
Surrogate: Tetrachlorometaxylene				32-120 %	57.6	%	
Surrogate: Decachlorobiphenyl [2C]				29-120 %	42.5	%	
Surrogate: Tetrachlorometaxylene [2C]				32-120 %	54.6	%	



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/02/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:28

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-02 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	ND	ug/L	U
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	1	0.142	0.500	ND	ug/L	U
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-02 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:28

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-02 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	ND	ug/L	U
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0792	0.500	ND	ug/L	U
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-02 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/02/2021 09:55

Instrument: HYDRA Analyst: ML

Analyzed: 09/17/2021 15:21

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-02 A

Preparation Batch: BJI0424

Sample Size: 20 mL

Prepared: 09/15/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B		Sampled: 09/02/2021 09:55
Instrument: ICPMS1 Analyst: MCB		Analyzed: 09/17/2021 02:32
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21I0040-03 A 02
	Preparation Batch: BJI0460	Filtration Batch: BJI0110
	Prepared: 09/16/2021	Filtration Date: 09/03/2021 10:28
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	ND	ug/L	U
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	ND	ug/L	U
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	1	0.142	0.500	1.22	ug/L	
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	ND	ug/L	U



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:32

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-03 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	ND	ug/L	U
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	ND	ug/L	U
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

EB-3-20210209
21I0040-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/02/2021 09:55

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:22

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-03 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000028	mg/L	J



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

2110040-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/02/2021 10:55

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 15:35

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 2110040-04 I

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	106	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	97.6	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	96.3	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	103	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

2110040-04 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/02/2021 10:55

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 15:35

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 2110040-04 I

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	97.6	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	96.3	%	



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

21I0040-04 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/02/2021 10:55

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 19:08

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-04 H

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	8.49	ng/L	J
Surrogate: 1,2-Dichloroethane-d4				80-129 %	111	%	
Surrogate: Toluene-d8				80-120 %	97.4	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	91.6	%	


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 Project Manager: Meg Strong

Reported:
 05-Oct-2021 17:11

MW-37-20210209
21I0040-04 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS

Sampled: 09/02/2021 10:55

Analyzed: 09/30/2021 14:21

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJI0253 Sample Size: 500 mL
 Prepared: 09/09/2021 Final Volume: 0.5 mL

Extract ID: 21I0040-04 D 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJI0197 Initial Volume: 0.5 mL
 Cleaned: 24-Sep-2021 Final Volume: 0.5 mL

Extract ID: 21I0040-04 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.006	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	0.004	ug/L	J
Acenaphthene	83-32-9	1	0.003	0.010	0.808	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>					42-120 %	78.0	%
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>					29-120 %	88.7	%
<i>Surrogate: Fluoranthene-d10</i>					57-120 %	87.3	%



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

21I0040-04 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/02/2021 10:55

Instrument: FID4 Analyst: TWC

Analyzed: 09/23/2021 22:06

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-04 B 01

Preparation Batch: BJI0251

Sample Size: 500 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>97.3</i>	<i>%</i>	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

21I0040-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/02/2021 10:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/20/2021 20:19

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0040-04 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese	7439-96-5	10	1.42	5.00	588	ug/L	D



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

21I0040-04 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 10:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 02:37

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-04 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	7.61	ug/L	
Copper	7440-50-8	1	0.173	0.500	3.85	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	8.85	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

21I0040-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B		Sampled: 09/02/2021 10:55
Instrument: ICPMS1 Analyst: MCB		Analyzed: 09/20/2021 20:22
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21I0040-05 A 02
	Preparation Batch: BJI0460	Filtration Batch: BJI0110
	Prepared: 09/16/2021	Filtration Date: 09/03/2021 10:28
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	10	1.42	5.00	513	ug/L	D



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-37-20210209

21I0040-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 10:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:50

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-05 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	5.62	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	2.08	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	7.21	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/02/2021 11:50

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 15:56

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-06 H

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	104	%	
Surrogate: Toluene-d8				80-120 %	98.3	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	93.8	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	104	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-06 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/02/2021 11:50

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 15:56

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-06 H

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	98.3	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	93.8	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-06 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/02/2021 11:50

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 19:28

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-06 G

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	112	%	
Surrogate: Toluene-d8				80-120 %	97.0	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	91.5	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-06 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/02/2021 11:50

Instrument: FID4 Analyst: TWC

Analyzed: 09/23/2021 22:26

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-06 D 01

Preparation Batch: BJI0251

Sample Size: 500 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>96.3</i>	<i>%</i>	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-06 (Water)

Aroclor PCB

Method: EPA 8082A			Sampled: 09/02/2021 11:50
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 20:13
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0040-06 B 01
	Preparation Batch: BJI0252		
	Prepared: 09/09/2021		
	Sample Size: 1000 mL		
	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0040-06 B 01
	Cleanup Batch: CJI0207		
	Cleaned: 24-Sep-2021		
	Initial Volume: 0.5 mL		
	Final Volume: 0.5 mL		
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0040-06 B 01
	Cleanup Batch: CJI0205		
	Cleaned: 24-Sep-2021		
	Initial Volume: 0.5 uL		
	Final Volume: 0.5 uL		
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0040-06 B 01
	Cleanup Batch: CJI0206		
	Cleaned: 24-Sep-2021		
	Initial Volume: 0.5 uL		
	Final Volume: 0.5 uL		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	64.5	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	63.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	62.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	60.7	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-06 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 11:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/20/2021 20:53

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0040-06 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	44.7	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.91	ug/L	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-6-20210209

21I0040-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 11:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:55

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-07 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	28.1	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.283	ug/L	J



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

2110040-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/02/2021 12:55

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 16:17

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 2110040-08 K

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	0.19	ug/L	J
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	107	%	
Surrogate: Toluene-d8				80-120 %	96.9	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	93.1	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	101	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/02/2021 12:55

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 16:17

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-08 K

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	96.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	93.1	%	



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Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/02/2021 12:55

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 19:49

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-08 J

Preparation Batch: BJ10273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	112	%	
Surrogate: Toluene-d8				80-120 %	97.4	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	91.6	%	



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 09/02/2021 12:55

Instrument: NT14 Analyst: VTS

Analyzed: 09/28/2021 16:29

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-08 C 01

Preparation Batch: BJI0254

Sample Size: 1000 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
<i>Surrogate: 2-Fluorophenol</i>				30-160 %	60.2	%	
<i>Surrogate: Phenol-d5</i>				30-160 %	36.0	%	
<i>Surrogate: 2-Chlorophenol-d4</i>				30-160 %	90.9	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				30-160 %	79.4	%	
<i>Surrogate: Nitrobenzene-d5</i>				30-160 %	92.7	%	
<i>Surrogate: 2-Fluorobiphenyl</i>				30-160 %	95.0	%	
<i>Surrogate: 2,4,6-Tribromophenol</i>				30-160 %	103	%	
<i>Surrogate: p-Terphenyl-d14</i>				30-160 %	106	%	


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 05-Oct-2021 17:11

MW-65-20210209
21I0040-08 (Water)
Semivolatile Organic Compounds - SIM

 Method: EPA 8270E-SIM
 Instrument: NT11 Analyst: VTS

Sampled: 09/02/2021 12:55

Analyzed: 09/30/2021 14:51

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJI0253 Sample Size: 500 mL
 Prepared: 09/09/2021 Final Volume: 0.5 mL

Extract ID: 21I0040-08 F 01

 Sample Cleanup: Cleanup Method: Silica Gel
 Cleanup Batch: CJI0197 Initial Volume: 0.5 mL
 Cleaned: 24-Sep-2021 Final Volume: 0.5 mL

Extract ID: 21I0040-08 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.005	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.004	ug/L	J
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.002	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
<i>Surrogate: 2-Methylnaphthalene-d10</i>					42-120 %	74.8 %	
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>					29-120 %	83.1 %	
<i>Surrogate: Fluoranthene-d10</i>					57-120 %	84.3 %	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/02/2021 12:55

Instrument: FID4 Analyst: TWC

Analyzed: 09/23/2021 22:46

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-08 D 01

Preparation Batch: BJI0251

Sample Size: 500 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>104</i>	<i>%</i>	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Aroclor PCB

Method: EPA 8082A			Sampled: 09/02/2021 12:55
Instrument: ECD7 Analyst: JGR			Analyzed: 09/25/2021 20:33
Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 21I0040-08 B 01
	Preparation Batch: BJI0252		
	Sample Size: 1000 mL		
	Prepared: 09/09/2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 21I0040-08 B 01
	Cleanup Batch: CJI0207		
	Initial Volume: 0.5 mL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:21I0040-08 B 01
	Cleanup Batch: CJI0205		
	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:21I0040-08 B 01
	Cleanup Batch: CJI0206		
	Initial Volume: 0.5 uL		
	Cleaned: 24-Sep-2021	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	64.8	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	56.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	64.5	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	53.8	%	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/02/2021 12:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 03:11

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-08 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	27.0	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	12800	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.100	ug/L	
Manganese	7439-96-5	10	1.42	5.00	1150	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.0570	ug/L	J



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 12:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:24

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-08 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	2.58	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.240	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.280	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	2.70	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-08 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/02/2021 12:55

Instrument: HYDRA Analyst: ML

Analyzed: 09/17/2021 15:30

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-08 A

Preparation Batch: BJI0424

Sample Size: 20 mL

Prepared: 09/15/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 09/02/2021 12:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 03:15

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-09 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	18.8	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	2700	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	1110	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	ND	ug/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 12:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:28

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0040-09 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.641	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.216	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	2.54	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-65-20210209

21I0040-09 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/02/2021 12:55

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:29

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-09 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

TB-13-20210209

21I0040-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/02/2021 09:35

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 12:48

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-10 B

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	109	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	98.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	96.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

TB-13-20210209

21I0040-10 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/02/2021 09:35

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 12:48

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-10 B

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	98.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	96.0	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

TB-13-20210209

21I0040-10 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/02/2021 09:35

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 16:44

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-10 A

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	111	%	
Surrogate: Toluene-d8				80-120 %	98.6	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	92.9	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/02/2021 14:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 16:37

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-11 M

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	2.98	ug/L	
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	109	%	
Surrogate: Toluene-d8				80-120 %	98.4	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	94.3	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	101	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/02/2021 14:30

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 16:37

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-11 M

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	98.4	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	94.3	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/02/2021 14:30

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 20:09

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-11 J

Preparation Batch: BJI0273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	113	%	
Surrogate: Toluene-d8				80-120 %	96.2	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	91.8	%	



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Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/02/2021 14:30

Analyzed: 09/30/2021 15:21

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0253 Sample Size: 500 mL
Prepared: 09/09/2021 Final Volume: 0.5 mL

Extract ID: 21I0040-11 G 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0197 Initial Volume: 0.5 mL
Cleaned: 24-Sep-2021 Final Volume: 0.5 mL

Extract ID: 21I0040-11 G 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.006	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.006	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.299	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.003	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	75.6	%
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	78.1	%
Surrogate: Fluoranthene-d10					57-120 %	86.8	%



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/02/2021 14:30

Instrument: FID4 Analyst: TWC

Analyzed: 09/23/2021 23:07

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-11 D 01

Preparation Batch: BJI0251

Sample Size: 500 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.277	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	94.3	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/02/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 03:20

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-11 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	21.0	ug/L	
Chromium	7440-47-3	1	0.260	0.500	0.923	ug/L	
Iron	7439-89-6	1	18.2	36.0	14600	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.0560	ug/L	J
Manganese	7439-96-5	20	2.84	10.0	3230	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	3.07	ug/L	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:33

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-11 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	5.43	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.461	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.209	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	0.918	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-11 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/02/2021 14:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/17/2021 15:33

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-11 A

Preparation Batch: BJI0424

Sample Size: 20 mL

Prepared: 09/15/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 09/02/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 03:24

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0040-12 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	18.0	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.856	ug/L	
Iron, Dissolved	7439-89-6	1	18.2	36.0	11900	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	20	2.84	10.0	3200	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	2.23	ug/L	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:37

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-12 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	4.71	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.340	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.685	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-74-20210209

21I0040-12 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/02/2021 14:30

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:31

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-12 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000029	mg/L	J



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 09/02/2021 15:55

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 16:58

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-13 J

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.12	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	110	%	
Surrogate: Toluene-d8				80-120 %	97.7	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	94.4	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	104	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 09/02/2021 15:55

Instrument: NT2 Analyst: PKC

Analyzed: 09/07/2021 16:58

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-13 J

Preparation Batch: BJI0168

Sample Size: 10 mL

Prepared: 09/07/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	97.7	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	94.4	%	



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 09/02/2021 15:55

Instrument: NT16 Analyst: PB

Analyzed: 09/09/2021 20:29

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21I0040-13 K

Preparation Batch: BJ10273

Sample Size: 10 mL

Prepared: 09/08/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	113	%	
Surrogate: Toluene-d8				80-120 %	95.7	%	
Surrogate: 4-Bromofluorobenzene				75-125 %	91.8	%	



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Project: Lower Duwamish Q3
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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/02/2021 15:55

Analyzed: 09/30/2021 15:51

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0253
Prepared: 09/09/2021

Sample Size: 500 mL

Final Volume: 0.5 mL

Extract ID: 21I0040-13 F 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0197
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL

Final Volume: 0.5 mL

Extract ID: 21I0040-13 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.013	ug/L	
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.006	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.054	ug/L	
Acenaphthylene	208-96-8	1	0.002	0.010	0.011	ug/L	
Acenaphthene	83-32-9	1	0.003	0.010	2.29	ug/L	E
Dibenzofuran	132-64-9	1	0.002	0.010	0.013	ug/L	
Fluorene	86-73-7	1	0.002	0.010	0.045	ug/L	
Phenanthrene	85-01-8	1	0.001	0.010	0.061	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.032	ug/L	
Carbazole	86-74-8	1	0.001	0.010	0.010	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	0.019	ug/L	
Pyrene	129-00-0	1	0.001	0.010	0.014	ug/L	
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	0.010	ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	81.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	78.4 %	
Surrogate: Fluoranthene-d10					57-120 %	83.0 %	



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 09/02/2021 15:55

Instrument: FID4 Analyst: TWC

Analyzed: 09/23/2021 23:27

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21I0040-13 D 01

Preparation Batch: BJI0251

Sample Size: 500 mL

Prepared: 09/09/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	2.31	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	0.806	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	84.9	%	



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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 09/02/2021 15:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/17/2021 03:28

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21I0040-13 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium	7440-39-3	1	0.114	0.500	17.6	ug/L	
Chromium	7440-47-3	1	0.260	0.500	1.28	ug/L	
Iron	7439-89-6	1	18.2	36.0	9850	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.586	ug/L	
Manganese	7439-96-5	10	1.42	5.00	1280	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	0.0310	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	7.77	ug/L	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 15:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:42

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-13 A 01

Preparation Batch: BJI0423

Sample Size: 25 mL

Prepared: 09/15/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	9.39	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	0.0320	ug/L	J
Cobalt	7440-48-4	1	0.0178	0.200	6.48	ug/L	
Copper	7440-50-8	1	0.173	0.500	4.41	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	8.71	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.302	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-13 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 09/02/2021 15:55

Instrument: HYDRA Analyst: ML

Analyzed: 09/17/2021 15:35

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-13 A

Preparation Batch: BJI0424

Sample Size: 20 mL

Prepared: 09/15/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209
2110040-13RE1 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM
Instrument: NT11 Analyst: VTS

Sampled: 09/02/2021 15:55

Analyzed: 10/01/2021 12:06

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJI0253
Prepared: 09/09/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 2110040-13RE1 F 01

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CJI0197
Cleaned: 24-Sep-2021

Initial Volume: 0.5 mL
Final Volume: 0.5 mL

Extract ID: 2110040-13RE1 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	10	0.013	0.100	0.015	ug/L	J, D
2-Methylnaphthalene	91-57-6	10	0.010	0.100	ND	ug/L	U
1-Methylnaphthalene	90-12-0	10	0.009	0.100	0.057	ug/L	J, D
Acenaphthylene	208-96-8	10	0.019	0.100	ND	ug/L	U
Acenaphthene	83-32-9	10	0.029	0.100	3.78	ug/L	D
Dibenzofuran	132-64-9	10	0.015	0.100	ND	ug/L	U
Fluorene	86-73-7	10	0.015	0.100	0.045	ug/L	J, D
Phenanthrene	85-01-8	10	0.013	0.100	0.070	ug/L	J, D
Anthracene	120-12-7	10	0.012	0.100	0.016	ug/L	J, D
Carbazole	86-74-8	10	0.012	0.100	ND	ug/L	U
Fluoranthene	206-44-0	10	0.017	0.100	0.019	ug/L	J, D
Pyrene	129-00-0	10	0.012	0.100	0.015	ug/L	J, D
Benzo(a)anthracene	56-55-3	10	0.008	0.100	ND	ug/L	U
Chrysene	218-01-9	10	0.009	0.100	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	10	0.005	0.100	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	10	0.032	0.100	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	10	0.019	0.100	ND	ug/L	U
Benzofluoranthenes, Total		10	0.036	0.100	ND	ug/L	U
Benzo(a)pyrene	50-32-8	10	0.025	0.100	ND	ug/L	U
Perylene	1985-5-0	10	0.059	0.100	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	0.010	0.100	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	10	0.013	0.100	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	10	0.014	0.100	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	88.5 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	73.3 %	
Surrogate: Fluoranthene-d10					57-120 %	91.3 %	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B	Sampled: 09/02/2021 15:55
Instrument: ICPMS1 Analyst: MCB	Analyzed: 09/17/2021 03:33
Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
	Preparation Batch: BJI0460
	Sample Size: 25 mL
	Final Volume: 25 mL
	Extract ID: 21I0040-14 A 02
	Filtration Batch: BJI0110
	Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	12.5	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.774	ug/L	
Iron, Dissolved	7439-89-6	1	18.2	36.0	7780	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	0.153	ug/L	
Manganese, Dissolved	7439-96-5	10	1.42	5.00	1190	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	4.53	ug/L	



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 09/02/2021 15:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 09/21/2021 15:46

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21I0040-14 A 02

Preparation Batch: BJI0460

Sample Size: 25 mL

Filtration Batch: BJI0110

Prepared: 09/16/2021

Final Volume: 25 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	7.16	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	5.72	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.840	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	7.35	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.192	ug/L	J
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, Incorporated
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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

MW-61-20210209

21I0040-14 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 09/02/2021 15:55

Instrument: HYDRA Analyst: ML

Analyzed: 09/14/2021 16:34

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21I0040-14 A 01

Preparation Batch: BJI0383

Sample Size: 20 mL

Filtration Batch: BJI0110

Prepared: 09/14/2021

Final Volume: 20 mL

Filtration Date: 09/03/2021 10:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000030	mg/L	J


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 17:11

Volatile Organic Compounds - Quality Control
Batch BJI0168 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0168-BLK1)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 12:07			
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	4.88		ug/L	5.00		97.7	80-120			
Surrogate: 4-Bromofluorobenzene	4.78		ug/L	5.00		95.5	80-120			
Blank (BJI0168-BLK2)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 12:07			
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	5.30		ug/L	5.00		106	80-129			
Surrogate: Toluene-d8	4.88		ug/L	5.00		97.7	80-120			
Surrogate: 4-Bromofluorobenzene	4.78		ug/L	5.00		95.5	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.10		ug/L	5.00		102	80-120			
LCS (BJI0168-BS1)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 10:24			
Gasoline Range Organics (Tol-Nap)	1120	100	ug/L	1000		112	72-128			
Surrogate: Toluene-d8	5.08		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.04		ug/L	5.00		101	80-120			
LCS (BJI0168-BS2)										
					Prepared: 07-Sep-2021		Analyzed: 07-Sep-2021 10:45			
Vinyl Chloride	9.88	0.08	0.20	ug/L	10.0	98.8	66-133			
1,1-Dichloroethene	10.4	0.08	0.20	ug/L	10.0	104	69-135			
trans-1,2-Dichloroethene	9.45	0.07	0.20	ug/L	10.0	94.5	78-128			
cis-1,2-Dichloroethene	10.1	0.08	0.20	ug/L	10.0	101	80-121			
Benzene	9.91	0.05	0.20	ug/L	10.0	99.1	80-120			
Trichloroethene	9.91	0.07	0.20	ug/L	10.0	99.1	80-120			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 17:11

Volatile Organic Compounds - Quality Control
Batch BJI0168 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0168-BS2)						Prepared: 07-Sep-2021	Analyzed: 07-Sep-2021 10:45				
Toluene	9.59	0.05	0.20	ug/L	10.0		95.9	80-120			
Tetrachloroethene	9.92	0.09	0.20	ug/L	10.0		99.2	80-120			
Ethylbenzene	9.72	0.05	0.20	ug/L	10.0		97.2	80-120			
m,p-Xylene	20.0	0.14	0.40	ug/L	20.0		100	80-121			
o-Xylene	9.74	0.08	0.20	ug/L	10.0		97.4	80-121			
Xylenes, total	29.7	0.22	0.60	ug/L	30.0		99.2	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.46			ug/L	5.00		109	80-129			
<i>Surrogate: Toluene-d8</i>	5.07			ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.01			ug/L	5.00		100	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.97			ug/L	5.00		99.3	80-120			
LCS Dup (BJI0168-BSD1)						Prepared: 07-Sep-2021	Analyzed: 07-Sep-2021 11:05				
Gasoline Range Organics (Tol-Nap)	1050		100	ug/L	1000		105	72-128	6.31	30	
<i>Surrogate: Toluene-d8</i>	5.04			ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.89			ug/L	5.00		97.8	80-120			
LCS Dup (BJI0168-BSD2)						Prepared: 07-Sep-2021	Analyzed: 07-Sep-2021 11:26				
Vinyl Chloride	10.7	0.08	0.20	ug/L	10.0		107	66-133	8.10	30	
1,1-Dichloroethene	10.8	0.08	0.20	ug/L	10.0		108	69-135	3.85	30	
trans-1,2-Dichloroethene	10.1	0.07	0.20	ug/L	10.0		101	78-128	6.81	30	
cis-1,2-Dichloroethene	10.4	0.08	0.20	ug/L	10.0		104	80-121	3.30	30	
Benzene	10.4	0.05	0.20	ug/L	10.0		104	80-120	5.19	30	
Trichloroethene	10.6	0.07	0.20	ug/L	10.0		106	80-120	6.31	30	
Toluene	10.2	0.05	0.20	ug/L	10.0		102	80-120	5.71	30	
Tetrachloroethene	10.1	0.09	0.20	ug/L	10.0		101	80-120	1.94	30	
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	3.56	30	
m,p-Xylene	20.6	0.14	0.40	ug/L	20.0		103	80-121	2.78	30	
o-Xylene	10.2	0.08	0.20	ug/L	10.0		102	80-121	4.49	30	
Xylenes, total	30.8	0.22	0.60	ug/L	30.0		103	76-127	3.35	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.35			ug/L	5.00		107	80-129			
<i>Surrogate: Toluene-d8</i>	5.08			ug/L	5.00		102	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.16			ug/L	5.00		103	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.98			ug/L	5.00		99.7	80-120			



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Volatile Organic Compounds - SIM - Quality Control

Batch BJI0273 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0273-BLK1)					Prepared: 08-Sep-2021 Analyzed: 09-Sep-2021 16:03						
Vinyl chloride	6.23	5.01	20.0	ng/L							J
Surrogate: 1,2-Dichloroethane-d4	5710			ng/L	5000		114	80-129			
Surrogate: Toluene-d8	5010			ng/L	5000		100	80-120			
Surrogate: 4-Bromofluorobenzene	4730			ng/L	5000		94.6	75-125			
LCS (BJI0273-BS1)					Prepared: 08-Sep-2021 Analyzed: 09-Sep-2021 15:02						
Vinyl chloride	2350	5.01	20.0	ng/L	2000		117	62-141			
Surrogate: 1,2-Dichloroethane-d4	5530			ng/L	5000		111	80-129			
Surrogate: Toluene-d8	5130			ng/L	5000		103	80-120			
Surrogate: 4-Bromofluorobenzene	4920			ng/L	5000		98.4	75-125			
LCS Dup (BJI0273-BSD1)					Prepared: 08-Sep-2021 Analyzed: 09-Sep-2021 15:23						
Vinyl chloride	2000	5.01	20.0	ng/L	2000		100	62-141	15.90	30	
Surrogate: 1,2-Dichloroethane-d4	5500			ng/L	5000		110	80-129			
Surrogate: Toluene-d8	5110			ng/L	5000		102	80-120			
Surrogate: 4-Bromofluorobenzene	4980			ng/L	5000		99.7	75-125			


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 Project: Lower Duwamish Q3
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 05-Oct-2021 17:11

Semivolatile Organic Compounds - Quality Control
Batch BJI0254 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0254-BLK1)											
						Prepared: 09-Sep-2021 Analyzed: 28-Sep-2021 13:27					
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
<i>Surrogate: 2-Fluorophenol</i>	4.51			ug/L	7.50		60.1	30-160			
<i>Surrogate: Phenol-d5</i>	2.48			ug/L	7.50		33.1	30-160			
<i>Surrogate: 2-Chlorophenol-d4</i>	6.60			ug/L	7.50		88.0	30-160			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	3.95			ug/L	5.00		79.1	30-160			
<i>Surrogate: Nitrobenzene-d5</i>	4.53			ug/L	5.00		90.6	30-160			
<i>Surrogate: 2-Fluorobiphenyl</i>	4.55			ug/L	5.00		91.0	30-160			
<i>Surrogate: 2,4,6-Tribromophenol</i>	6.45			ug/L	7.50		86.0	30-160			
<i>Surrogate: p-Terphenyl-d14</i>	4.95			ug/L	5.00		99.0	30-160			
LCS (BJI0254-BS1)											
						Prepared: 09-Sep-2021 Analyzed: 28-Sep-2021 14:03					
1,4-Dichlorobenzene	4.4	0.03	0.2	ug/L	5.00		87.2	30-160			
1,2-Dichlorobenzene	4.0	0.03	0.2	ug/L	5.00		81.0	30-160			
2,4-Dimethylphenol	11.4	0.3	1.0	ug/L	13.0		87.6	30-160			
Benzoic acid	7.0	0.1	2.0	ug/L	23.0		30.4	30-160			
N-Nitrosodiphenylamine	4.7	0.03	0.2	ug/L	5.00		94.3	30-160			
Pentachlorophenol	12.2	0.1	1.0	ug/L	13.0		94.0	30-160			
Di-n-Butylphthalate	5.4	0.05	0.2	ug/L	5.00		108	30-160			
Butylbenzylphthalate	4.7	0.07	0.2	ug/L	5.00		93.5	30-160			
bis(2-Ethylhexyl)phthalate	5.3	0.2	0.2	ug/L	5.00		105	30-160			
<i>Surrogate: 2-Fluorophenol</i>	5.08			ug/L	7.50		67.7	30-160			
<i>Surrogate: Phenol-d5</i>	3.23			ug/L	7.50		43.0	30-160			
<i>Surrogate: 2-Chlorophenol-d4</i>	7.71			ug/L	7.50		103	30-160			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.32			ug/L	5.00		86.4	30-160			
<i>Surrogate: Nitrobenzene-d5</i>	5.18			ug/L	5.00		104	30-160			
<i>Surrogate: 2-Fluorobiphenyl</i>	4.96			ug/L	5.00		99.2	30-160			



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Semivolatile Organic Compounds - Quality Control

Batch BJI0254 - EPA 3510C SepF

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0254-BS1)						Prepared: 09-Sep-2021	Analyzed: 28-Sep-2021 14:03				
Surrogate: 2,4,6-Tribromophenol	7.50			ug/L	7.50		100	30-160			
Surrogate: p-Terphenyl-d14	5.18			ug/L	5.00		104	30-160			
LCS Dup (BJI0254-BSD1)						Prepared: 09-Sep-2021	Analyzed: 28-Sep-2021 14:40				
1,4-Dichlorobenzene	3.9	0.03	0.2	ug/L	5.00		78.2	30-160	11.00	30	
1,2-Dichlorobenzene	3.6	0.03	0.2	ug/L	5.00		72.3	30-160	11.40	30	
2,4-Dimethylphenol	10.6	0.3	1.0	ug/L	13.0		81.6	30-160	7.16	30	
Benzoic acid	5.9	0.1	2.0	ug/L	23.0		25.8	30-160	16.60	30	*
N-Nitrosodiphenylamine	4.4	0.03	0.2	ug/L	5.00		87.2	30-160	7.80	30	
Pentachlorophenol	11.7	0.1	1.0	ug/L	13.0		90.1	30-160	4.25	30	
Di-n-Butylphthalate	5.2	0.05	0.2	ug/L	5.00		104	30-160	4.22	30	
Butylbenzylphthalate	4.4	0.07	0.2	ug/L	5.00		88.9	30-160	5.02	30	
bis(2-Ethylhexyl)phthalate	5.0	0.2	0.2	ug/L	5.00		99.1	30-160	5.85	30	
Surrogate: 2-Fluorophenol	4.51			ug/L	7.50		60.1	30-160			
Surrogate: Phenol-d5	2.81			ug/L	7.50		37.5	30-160			
Surrogate: 2-Chlorophenol-d4	6.90			ug/L	7.50		91.9	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.78			ug/L	5.00		75.7	30-160			
Surrogate: Nitrobenzene-d5	4.62			ug/L	5.00		92.5	30-160			
Surrogate: 2-Fluorobiphenyl	4.48			ug/L	5.00		89.6	30-160			
Surrogate: 2,4,6-Tribromophenol	6.82			ug/L	7.50		90.9	30-160			
Surrogate: p-Terphenyl-d14	4.74			ug/L	5.00		94.8	30-160			



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0253 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0253-BLK1)						Prepared: 09-Sep-2021 Analyzed: 30-Sep-2021 12:51					
Naphthalene	0.003	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.001	0.001	0.010	ug/L							J
1-Methylnaphthalene	0.0009	0.0009	0.010	ug/L							J
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	0.002	0.002	0.010	ug/L							J
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.230			ug/L	0.300		76.6	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.276			ug/L	0.300		92.0	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.257			ug/L	0.300		85.7	57-120			
LCS (BJI0253-BS1)						Prepared: 09-Sep-2021 Analyzed: 30-Sep-2021 13:21					
Naphthalene	0.227	0.001	0.010	ug/L	0.300		75.8	37-120			
2-Methylnaphthalene	0.229	0.001	0.010	ug/L	0.300		76.3	37-120			
1-Methylnaphthalene	0.227	0.0009	0.010	ug/L	0.300		75.6	29-120			
Acenaphthylene	0.223	0.002	0.010	ug/L	0.300		74.4	41-120			
Acenaphthene	0.216	0.003	0.010	ug/L	0.300		72.0	41-120			
Dibenzofuran	0.223	0.002	0.010	ug/L	0.300		74.2	38-120			
Fluorene	0.238	0.002	0.010	ug/L	0.300		79.4	43-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0253 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0253-BS1)											
Prepared: 09-Sep-2021						Analyzed: 30-Sep-2021 13:21					
Phenanthrene	0.228	0.001	0.010	ug/L	0.300		76.0	41-120			
Anthracene	0.217	0.001	0.010	ug/L	0.300		72.5	40-120			
Carbazole	0.237	0.001	0.010	ug/L	0.300		78.9	30-160			
Fluoranthene	0.240	0.002	0.010	ug/L	0.300		80.0	45-120			
Pyrene	0.238	0.001	0.010	ug/L	0.300		79.2	41-120			
Benzo(a)anthracene	0.237	0.0008	0.010	ug/L	0.300		79.2	42-120			
Chrysene	0.233	0.0009	0.010	ug/L	0.300		77.7	44-120			
Benzo(b)fluoranthene	0.244	0.0005	0.010	ug/L	0.300		81.4	44-120			
Benzo(k)fluoranthene	0.261	0.003	0.010	ug/L	0.300		87.2	50-120			
Benzo(j)fluoranthene	0.250	0.002	0.010	ug/L	0.300		83.5	39-160			
Benzofluoranthenes, Total	0.756	0.004	0.010	ug/L	0.900		84.0	46-120			
Benzo(a)pyrene	0.219	0.002	0.010	ug/L	0.300		72.9	35-120			
Perylene	0.204	0.006	0.010	ug/L	0.300		68.0	30-160			
Indeno(1,2,3-cd)pyrene	0.266	0.001	0.010	ug/L	0.300		88.8	37-120			
Dibenzo(a,h)anthracene	0.271	0.001	0.010	ug/L	0.300		90.3	34-120			
Benzo(g,h,i)perylene	0.247	0.001	0.010	ug/L	0.300		82.4	38-120			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.241			ug/L	0.300		80.2	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.290			ug/L	0.300		96.6	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.260			ug/L	0.300		86.7	57-120			
LCS Dup (BJI0253-BSD1)											
Prepared: 09-Sep-2021						Analyzed: 30-Sep-2021 13:51					
Naphthalene	0.228	0.001	0.010	ug/L	0.300		76.1	37-120	0.38	30	
2-Methylnaphthalene	0.229	0.001	0.010	ug/L	0.300		76.3	37-120	0.12	30	
1-Methylnaphthalene	0.229	0.0009	0.010	ug/L	0.300		76.3	29-120	0.96	30	
Acenaphthylene	0.228	0.002	0.010	ug/L	0.300		76.0	41-120	2.20	30	
Acenaphthene	0.222	0.003	0.010	ug/L	0.300		73.9	41-120	2.50	30	
Dibenzofuran	0.226	0.002	0.010	ug/L	0.300		75.4	38-120	1.54	30	
Fluorene	0.245	0.002	0.010	ug/L	0.300		81.7	43-120	2.89	30	
Phenanthrene	0.234	0.001	0.010	ug/L	0.300		77.9	41-120	2.39	30	
Anthracene	0.228	0.001	0.010	ug/L	0.300		76.1	40-120	4.82	30	
Carbazole	0.245	0.001	0.010	ug/L	0.300		81.5	30-160	3.31	30	
Fluoranthene	0.245	0.002	0.010	ug/L	0.300		81.8	45-120	2.26	30	
Pyrene	0.243	0.001	0.010	ug/L	0.300		81.1	41-120	2.29	30	
Benzo(a)anthracene	0.246	0.0008	0.010	ug/L	0.300		82.1	42-120	3.66	30	
Chrysene	0.240	0.0009	0.010	ug/L	0.300		80.0	44-120	2.91	30	



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJI0253 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJI0253-BSD1)						Prepared: 09-Sep-2021 Analyzed: 30-Sep-2021 13:51					
Benzo(b)fluoranthene	0.246	0.0005	0.010	ug/L	0.300		82.1	44-120	0.94	30	
Benzo(k)fluoranthene	0.271	0.003	0.010	ug/L	0.300		90.4	50-120	3.61	30	
Benzo(j)fluoranthene	0.259	0.002	0.010	ug/L	0.300		86.2	39-160	3.17	30	
Benzofluoranthenes, Total	0.776	0.004	0.010	ug/L	0.900		86.2	46-120	2.61	30	
Benzo(a)pyrene	0.234	0.002	0.010	ug/L	0.300		78.0	35-120	6.80	30	
Perylene	0.217	0.006	0.010	ug/L	0.300		72.2	30-160	6.03	30	
Indeno(1,2,3-cd)pyrene	0.267	0.001	0.010	ug/L	0.300		88.9	37-120	0.13	30	
Dibenzo(a,h)anthracene	0.259	0.001	0.010	ug/L	0.300		86.3	34-120	4.54	30	
Benzo(g,h,i)perylene	0.253	0.001	0.010	ug/L	0.300		84.4	38-120	2.29	30	
Surrogate: 2-Methylnaphthalene-d10	0.231			ug/L	0.300		77.0	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.268			ug/L	0.300		89.4	29-120			
Surrogate: Fluoranthene-d10	0.254			ug/L	0.300		84.6	57-120			



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Petroleum Hydrocarbons - Quality Control

Batch BJI0251 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0251-BLK1)										
					Prepared: 09-Sep-2021 Analyzed: 23-Sep-2021 21:06					
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: o-Terphenyl	0.230		mg/L	0.225		102	50-150			
LCS (BJI0251-BS1)										
					Prepared: 09-Sep-2021 Analyzed: 23-Sep-2021 21:26					
Diesel Range Organics (C12-C24)	3.00	0.100	mg/L	3.00		100	56-120			
Surrogate: o-Terphenyl	0.243		mg/L	0.225		108	50-150			
LCS Dup (BJI0251-BSD1)										
					Prepared: 09-Sep-2021 Analyzed: 23-Sep-2021 21:46					
Diesel Range Organics (C12-C24)	2.81	0.100	mg/L	3.00		93.6	56-120	6.79	30	
Surrogate: o-Terphenyl	0.227		mg/L	0.225		101	50-150			



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Aroclor PCB - Quality Control

Batch BJI0252 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0252-BLK1)											
						Prepared: 09-Sep-2021 Analyzed: 25-Sep-2021 18:10					
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0106			ug/L	0.0200		52.8	29-120			
Surrogate: Tetrachlorometaxylene	0.0120			ug/L	0.0200		59.9	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0103			ug/L	0.0200		51.6	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0114			ug/L	0.0200		57.1	32-120			
LCS (BJI0252-BS1)											
						Prepared: 09-Sep-2021 Analyzed: 25-Sep-2021 18:31					
Aroclor 1016 [2C]	0.038	0.002	0.010	ug/L	0.0500		76.7	54-120			
Aroclor 1260 [2C]	0.031	0.003	0.010	ug/L	0.0500		61.8	51-128			
Surrogate: Decachlorobiphenyl	0.0105			ug/L	0.0200		52.7	29-120			
Surrogate: Tetrachlorometaxylene	0.0126			ug/L	0.0200		63.2	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0103			ug/L	0.0200		51.6	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0120			ug/L	0.0200		60.1	32-120			
LCS Dup (BJI0252-BSD1)											
						Prepared: 09-Sep-2021 Analyzed: 25-Sep-2021 18:51					
Aroclor 1016 [2C]	0.036	0.002	0.010	ug/L	0.0500		72.5	54-120	5.67	30	
Aroclor 1260 [2C]	0.030	0.003	0.010	ug/L	0.0500		59.8	51-128	3.25	30	
Surrogate: Decachlorobiphenyl	0.0100			ug/L	0.0200		50.0	29-120			
Surrogate: Tetrachlorometaxylene	0.0122			ug/L	0.0200		61.0	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.00977			ug/L	0.0200		48.9	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0115			ug/L	0.0200		57.5	32-120			



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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Metals and Metallic Compounds - Quality Control

Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0423-BLK1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:28						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Manganese	55	ND	0.142	0.500	ug/L							U
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.179	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U

LCS (BJI0423-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:32						
Barium	135	25.2	0.114	0.500	ug/L	25.0		101	80-120			
Barium	137	25.3	0.0765	0.500	ug/L	25.0		101	80-120			
Chromium	52	25.3	0.260	0.500	ug/L	25.0		101	80-120			
Chromium	53	25.9	0.239	0.500	ug/L	25.0		103	80-120			
Iron	54	4930	18.2	36.0	ug/L	5000		98.7	80-120			
Iron	57	4620	6.63	36.0	ug/L	5000		92.4	80-120			
Manganese	55	25.4	0.142	0.500	ug/L	25.0		101	80-120			
Silver	107	23.6	0.0220	0.200	ug/L	25.0		94.3	80-120			
Vanadium	51a	24.9	0.0556	0.200	ug/L	25.0		99.5	80-120			
Vanadium	51b	25.1	0.0521	0.200	ug/L	25.0		100	80-120			
Arsenic	75a	24.6	0.0373	0.200	ug/L	25.0		98.3	80-120			
Cadmium	111	24.3	0.0300	0.100	ug/L	25.0		97.2	80-120			



Analytical Resources, Incorporated
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Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Metals and Metallic Compounds - Quality Control

Batch BJI0423 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0423-BS1)						Prepared: 15-Sep-2021 Analyzed: 15-Sep-2021 22:32						
Cadmium	114	23.7	0.0400	0.100	ug/L	25.0		94.9	80-120			
Cobalt	59	23.6	0.0178	0.200	ug/L	25.0		94.5	80-120			
Copper	63	23.3	0.173	0.500	ug/L	25.0		93.4	80-120			
Copper	65	23.3	0.350	0.500	ug/L	25.0		93.2	80-120			
Nickel	60	23.5	0.0792	0.500	ug/L	25.0		94.1	80-120			
Nickel	62	23.5	0.220	0.500	ug/L	25.0		94.1	80-120			
Selenium	78	76.3	0.179	0.500	ug/L	80.0		95.4	80-120			
Zinc	66	72.9	2.92	6.00	ug/L	80.0		91.1	80-120			
Zinc	67	75.1	0.940	6.00	ug/L	80.0		93.8	80-120			

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0423-BLK2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:27						
Lead	208	ND	0.0513	0.100	ug/L							U
LCS (BJI0423-BS2)						Prepared: 15-Sep-2021 Analyzed: 16-Sep-2021 20:31						
Lead	208	26.0	0.0513	0.100	ug/L	25.0		104	80-120			



Analytical Resources, Incorporated
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Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Metals and Metallic Compounds - Quality Control

Batch BJI0424 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0424-BLK1)						Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 15:16					
Mercury	ND	0.000013	0.000100	mg/L							U
LCS (BJI0424-BS1)						Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 15:19					
Mercury	0.00195	0.000013	0.000100	mg/L	0.00200		97.6	80-120			
Duplicate (BJI0424-DUP1)						Source: 21I0040-02 Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 15:23					
Mercury	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJI0424-MS1)						Source: 21I0040-02 Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 15:26					
Mercury	0.000845	0.000013	0.000100	mg/L	0.00100	ND	84.5	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJI0424-MSD1)						Source: 21I0040-02 Prepared: 15-Sep-2021 Analyzed: 17-Sep-2021 15:28					
Mercury	0.000855	0.000013	0.000100	mg/L	0.00100	ND	85.5	75-125	1.15	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											



Analytical Resources, Incorporated
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0383 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0383-BLK1)						Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 15:54					
Mercury, Dissolved	0.000028	0.000013	0.000100	mg/L							J
LCS (BJI0383-BS1)						Prepared: 14-Sep-2021 Analyzed: 14-Sep-2021 16:01					
Mercury, Dissolved	0.00174	0.000013	0.000100	mg/L	0.00200		87.2	80-120			



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Analytical Report

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Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0460 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJI0460-BLK1)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 18:03						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Manganese, Dissolved	55	0.234	0.142	0.500	ug/L							J
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
Blank (BJI0460-BLK2)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 20:19						
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	6.63	20.0	ug/L							U
LCS (BJI0460-BS1)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 18:07						
Barium, Dissolved	135	24.0	0.114	0.500	ug/L	25.0		96.1	80-120			
Barium, Dissolved	137	24.2	0.0765	0.500	ug/L	25.0		96.7	80-120			
Chromium, Dissolved	52	24.7	0.260	0.500	ug/L	25.0		99.0	80-120			
Chromium, Dissolved	53	24.7	0.239	0.500	ug/L	25.0		98.7	80-120			
Iron, Dissolved	54	5120	18.2	36.0	ug/L	5000		102	80-120			
Iron, Dissolved	57	4810	6.63	20.0	ug/L	5000		96.2	80-120			
Lead, Dissolved	208	24.3	0.0513	0.100	ug/L	25.0		97.0	80-120			
Manganese, Dissolved	55	24.8	0.142	0.500	ug/L	25.0		99.1	80-120			
Silver, Dissolved	107	24.6	0.0220	0.200	ug/L	25.0		98.4	80-120			



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q3
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJI0460 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJI0460-BS1)						Prepared: 16-Sep-2021 Analyzed: 16-Sep-2021 18:07						
Vanadium, Dissolved	51a	24.5	0.0556	0.200	ug/L	25.0		97.8	80-120			
Vanadium, Dissolved	51b	24.4	0.0521	0.200	ug/L	25.0		97.8	80-120			
Arsenic, Dissolved	75a	23.3	0.0373	0.200	ug/L	25.0		93.4	80-120			
Cadmium, Dissolved	111	24.7	0.0300	0.100	ug/L	25.0		98.9	80-120			
Cadmium, Dissolved	114	24.2	0.0400	0.100	ug/L	25.0		96.9	80-120			
Cobalt, Dissolved	59	24.2	0.0178	0.200	ug/L	25.0		96.9	80-120			
Copper, Dissolved	63	24.0	0.173	0.500	ug/L	25.0		96.0	80-120			
Copper, Dissolved	65	24.2	0.350	0.500	ug/L	25.0		96.6	80-120			
Nickel, Dissolved	60	24.1	0.0792	0.500	ug/L	25.0		96.3	80-120			
Nickel, Dissolved	62	23.9	0.220	0.500	ug/L	25.0		95.7	80-120			
Selenium, Dissolved	78	70.6	0.179	0.500	ug/L	80.0		88.3	80-120			
Zinc, Dissolved	66	71.9	2.92	6.00	ug/L	80.0		89.9	80-120			
Zinc, Dissolved	67	69.4	0.940	6.00	ug/L	80.0		86.7	80-120			



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Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 6020B in Water</i>	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
<i>EPA 6020B UCT-KED in Water</i>	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC



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Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE



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Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE



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m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE



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1,2-Dichloroethane

NELAP,WADOE

Benzene

NELAP,WADOE

EPA 8270E in Water

Phenol

NELAP,DoD-ELAP

bis(2-chloroethyl) ether

NELAP,DoD-ELAP

2-Chlorophenol

NELAP,DoD-ELAP

1,3-Dichlorobenzene

NELAP,DoD-ELAP

1,4-Dichlorobenzene

NELAP,DoD-ELAP

1,2-Dichlorobenzene

NELAP,DoD-ELAP

Benzyl Alcohol

NELAP,DoD-ELAP

2,2'-Oxybis(1-chloropropane)

NELAP,DoD-ELAP

2-Methylphenol

NELAP,DoD-ELAP

Hexachloroethane

NELAP,DoD-ELAP

N-Nitroso-di-n-Propylamine

NELAP,DoD-ELAP

4-Methylphenol

NELAP,DoD-ELAP

Nitrobenzene

NELAP,DoD-ELAP

Isophorone

NELAP,DoD-ELAP

2-Nitrophenol

NELAP,DoD-ELAP

2,4-Dimethylphenol

NELAP,DoD-ELAP

Bis(2-Chloroethoxy)methane

NELAP,DoD-ELAP

2,4-Dichlorophenol

NELAP,DoD-ELAP

1,2,4-Trichlorobenzene

NELAP,DoD-ELAP

Naphthalene

NELAP,DoD-ELAP

Benzoic acid

NELAP,DoD-ELAP

4-Chloroaniline

NELAP,DoD-ELAP

Hexachlorobutadiene

NELAP,DoD-ELAP

4-Chloro-3-Methylphenol

NELAP,DoD-ELAP

2-Methylnaphthalene

NELAP,DoD-ELAP

Hexachlorocyclopentadiene

NELAP,DoD-ELAP

2,4,6-Trichlorophenol

NELAP,DoD-ELAP

2,4,5-Trichlorophenol

NELAP,DoD-ELAP

2-Chloronaphthalene

NELAP,DoD-ELAP

2-Nitroaniline

NELAP,DoD-ELAP

Acenaphthylene

NELAP,DoD-ELAP

Dimethylphthalate

NELAP,DoD-ELAP

2,6-Dinitrotoluene

NELAP,DoD-ELAP

Acenaphthene

NELAP,DoD-ELAP

3-Nitroaniline

NELAP,DoD-ELAP

2,4-Dinitrophenol

NELAP,DoD-ELAP



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Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)fluoranthene, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE



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Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE



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Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Project Manager: Meg Strong

Reported:
05-Oct-2021 17:11

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
J	Estimated concentration value detected below the reporting limit.
M	Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

19 November 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Soils 2021

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.

Associated Work Order(s)
21J0060

Associated SDG ID(s)
N/A

Shelly
Fishel

Digitally signed
by Shelly Fishel
Date: 2021.11.19
17:18:43 -08'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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: <u>21J0060</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>6</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>10/4</u>	Ice Present?
Client Contact: <u>Shoshanna Howard</u>				No. of Coolers: <u>2</u>	Cooler Temps: <u>see CRF</u>
Client Project Name: <u>LPW</u>		Analysis Requested			
Client Project #: <u>21-1-12596</u>					
Samplers: <u>5XS / RMV</u>		Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-048: 1.5-10042021	10/4	0905	Soil	1	X X
" " : 2.2-10042021	↓	0915	↓	↓	↓ ↓
" " : 6-10042021	↓	0920	↓	↓	↓ ↓
" " : 8.5-10042021	↓	0920	↓	↓	↓ ↓
SB-2021-049: 1-10042021	10/4	0930	Soil	1	X X
" " - 049: 2.2- "	↓	0932	↓	↓	↓ ↓
" " " : 6.5- "	↓	0935	↓	↓	↓ ↓
" " " : 7.5- "	↓	0940	↓	↓	↓ ↓
SB-2021-050: 0.5-10042021	10/4	0950	Soil	1	X X
SB- " - " : 2.5 "	"	0950	↓	↓	↓ ↓
Comments/Special Instructions	Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>		Relinquished by: (Signature)
	Printed Name: <u>Joseph Smiley</u>		Printed Name: <u>Raven Barbera</u>		Printed Name:
	Company: <u>Shan & Wil</u>		Company: <u>ARI</u>		Company:
	Date & Time: <u>10/4 14:57</u>		Date & Time: <u>10/4/21 1457</u>		Date & Time:

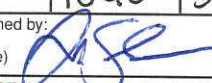


Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

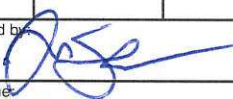
Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21J0060		Turn-around Requested: Standard			Page: 2 of 6		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com							
ARI Client Company: Shannon + Wilson		Phone:			Date: 10/4								Ice Present?	
Client Contact: Shoshana Howard					No. of Coolers: 2								Cooler Temps:	
Client Project Name: LDW														
Client Project #: 21-1-12596		Samplers: JXS/Rmv			Analysis Requested								Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	TPH-Dx	PCB Proclor								
SB-2021-050:6.5-10042021	10/4	1000	Soil	1	X	X								
" " " : 7.5 "	10/4	1000	Soil	1	X	X								
SB-2021-051:1.2-10042021	10/4	1010	Soil	1	X	X								
" " " : 2.4 "		1015												
" " " : 6.5 "		1020												
" " " : 8.0 "		1020												
" " " : 10.5 "		1025												
" " " : 12.5 "		1030												
SB-2021-052:0.1-10042021	10/4	1040	Soil	1	X	X								
SB-2021-052:2.4-11		1040	Soil	1	X	X								
Comments/Special Instructions	Relinquished by: (Signature) 		Received by: (Signature) 		Relinquished by: (Signature)		Received by: (Signature)							
	Printed Name: Joe Sander		Printed Name: Raven Barbera		Printed Name:		Printed Name:							
	Company: Shn & Wil		Company: ARI		Company:		Company:							
	Date & Time: 10/4 14:57		Date & Time: 10/4/21 1457		Date & Time:		Date & Time:							

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2170060		Turn-around Requested: Standard			Page: 3 of 6		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com						
ARI Client Company: Shannon & Wilson		Phone:			Date: 10/4				Ice Present?				
Client Contact: Shoshana Howard					No. of Coolers:				Cooler Temps:				
Client Project Name: LDW													
Client Project #: 21-1-12596		Samplers: JXS/RMV			Analysis Requested							Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	TPT-DX	PCB Analyzer							
SB-2021-052:6.0-10642021	10/4	1045	Soil	1	X	X							
SB-2021-052:7.7-10642021	10/4	1045	Soil	1	X	X							
RV													
Comments/Special Instructions		Relinquished by: (Signature)  Printed Name: Joe Sandberg Company: Shm & Wil Date & Time: 10/4 14:57			Received by: (Signature)  Printed Name: Raven Barbera Company: ARI Date & Time: 10/4/21 1457			Relinquished by: (Signature) Printed Name: Company: Date & Time:			Received by: (Signature) Printed Name: Company: Date & Time:		

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Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21J0060		Turn-around Requested: Standard		Page: 4 of 6	
ARI Client Company: Shannon & Wilson		Phone:		Date: 10/4	Ice Present?
Client Contact: Shoshana Howard		No. of Coolers:		Cooler Temps:	
Client Project Name: LDW		Analysis Requested			
Client Project #: 21-1-12596		Samplers: JXS / RMV		Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-053: 1.0-10042021	10/4	1055	Soil	1	
" " : 2.8-10042021		1055			
" " : 6.0-10042021		1100			
" " : 8.8-10042021		1100			
" " : 11.0-10042021		1110			
" " : 13.0-10042021		1110			
SB-2021-054: 0.5-10042021	10/4	1125	Soil	1	
" " : 2.5-10042021		1125			
" " : 5.9-10042021		1130			
" " : 7.0-10042021		1130			
Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)		Relinquished by: (Signature)	
	Printed Name: Joe Smiley	Printed Name: Raven Barbera		Printed Name:	
	Company: Shannon & Wilson	Company: ARI		Company:	
	Date & Time: 10/4 14:57	Date & Time: 10/4/21 1457		Date & Time:	



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21J0060		Turn-around Requested: Standard		Page: 5 of 6	
ARI Client Company: Shannon & Wilson		Phone:		Date: 10/4	Ice Present?
Client Contact: Shoshanna Howard				No. of Coolers:	Cooler Temps:
Client Project Name: LDW		Analysis Requested			
Client Project #: 21-1-12596					
Samplers: IXS / RMV		Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-055; 0.5-10042021	10/4	1145	Soil	1	H = Hold
11 11 : 2.2-10042021		1145			
11 11 : 5.5-10042021		1150			
11 11 : 7.5-10042021		1150			
SB-2021-056; 1.0-10042021	10/4	1200	Soil	1	
11 11 : 2.5-10042021		1200			
11 11 : 5.5-10042021		1205			
11 11 : 7.7-10042021		1205			
11 11 : 10.0-10042021		1215			
11 11 : 11.5-10042021		1215			
Comments/Special Instructions	Relinquished by: (Signature) [Signature]	Received by: (Signature) [Signature]		Relinquished by: (Signature)	
	Printed Name: Joe Sawley	Printed Name: Raven Barbera		Printed Name:	
	Company: Shan & Wil	Company: ARI		Company:	
	Date & Time: 10/4 14:57	Date & Time: 10/4/21 1457		Date & Time:	



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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 21J0060		Turn-around Requested: Standard		Page: 6 of 6	
ARI Client Company: Shannon & Wilson		Phone:		Date: 10/4	Ice Present?
Client Contact: Shoshana Howard				No. of Coolers:	Cooler Temps:
Client Project Name: LDW		Analysis Requested			
Client Project #: 21-1-12596		Samplers: JXS / RMV		Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-057: 0.8-10042021	10/4	1230	Soil	1	X X
11 11 : 2.4-10042021		1230			X X
11 11 : 5.5-10042021		1245			X X
11 11 : 7.5-10042021		1245			X X
11 11 : 10.0-10042021		1300			H H
11 11 : 11.5-10042021		1300			H H
SB-2021 *DuP		—			X X
Drum-Camp-10042021		1425			X X
Comments/Special Instructions					
Relinquished by: (Signature)		Received by: (Signature)		Relinquished by: (Signature)	
Printed Name: Joe Sanders		Printed Name: Raven Barbera		Printed Name:	
Company: Shan & Wil		Company: ARI		Company:	
Date & Time: 10/4 14:57		Date & Time: 10/4/21 1457		Date & Time:	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-2021-048:1.5-10042021	21J0060-01	Solid	04-Oct-2021 09:05	04-Oct-2021 14:57
SB-2021-048:2.2-10042021	21J0060-02	Solid	04-Oct-2021 09:15	04-Oct-2021 14:57
SB-2021-048:6-10042021	21J0060-03	Solid	04-Oct-2021 09:20	04-Oct-2021 14:57
SB-2021-048:8.5-10042021	21J0060-04	Solid	04-Oct-2021 09:20	04-Oct-2021 14:57
SB-2021-049:1-10042021	21J0060-05	Solid	04-Oct-2021 09:30	04-Oct-2021 14:57
SB-2021-049:2.2-10042021	21J0060-06	Solid	04-Oct-2021 09:32	04-Oct-2021 14:57
SB-2021-049:6.5-10042021	21J0060-07	Solid	04-Oct-2021 09:35	04-Oct-2021 14:57
SB-2021-049:7.5-10042021	21J0060-08	Solid	04-Oct-2021 09:40	04-Oct-2021 14:57
SB-2021-050:0.5-10042021	21J0060-09	Solid	04-Oct-2021 09:50	04-Oct-2021 14:57
SB-2021-050:2.5-10042021	21J0060-10	Solid	04-Oct-2021 09:50	04-Oct-2021 14:57
SB-2021-050:6.5-10042021	21J0060-11	Solid	04-Oct-2021 10:00	04-Oct-2021 14:57
SB-2021-050:7.5-10042021	21J0060-12	Solid	04-Oct-2021 10:00	04-Oct-2021 14:57
SB-2021-051:1.2-10042021	21J0060-13	Solid	04-Oct-2021 10:10	04-Oct-2021 14:57
SB-2021-051:2.4-10042021	21J0060-14	Solid	04-Oct-2021 10:15	04-Oct-2021 14:57
SB-2021-051:6.5-10042021	21J0060-15	Solid	04-Oct-2021 10:20	04-Oct-2021 14:57
SB-2021-051:8.0-10042021	21J0060-16	Solid	04-Oct-2021 10:20	04-Oct-2021 14:57
SB-2021-051:10.5-10042021	21J0060-17	Solid	04-Oct-2021 10:25	04-Oct-2021 14:57
SB-2021-051:12.5-10042021	21J0060-18	Solid	04-Oct-2021 10:30	04-Oct-2021 14:57
SB-2021-052:0.1-10042021	21J0060-19	Solid	04-Oct-2021 10:40	04-Oct-2021 14:57
SB-2021-052:2.4-10042021	21J0060-20	Solid	04-Oct-2021 10:40	04-Oct-2021 14:57
SB-2021-052:6.0-10042021	21J0060-21	Solid	04-Oct-2021 10:45	04-Oct-2021 14:57
SB-2021-052:7.7-10042021	21J0060-22	Solid	04-Oct-2021 10:45	04-Oct-2021 14:57
SB-2021-053:1.0-10042021	21J0060-23	Solid	04-Oct-2021 10:55	04-Oct-2021 14:57
SB-2021-053:2.8-10042021	21J0060-24	Solid	04-Oct-2021 10:55	04-Oct-2021 14:57
SB-2021-053:11.0-10042021	21J0060-27	Solid	04-Oct-2021 11:10	04-Oct-2021 14:57
SB-2021-053:13.0-10042021	21J0060-28	Solid	04-Oct-2021 11:10	04-Oct-2021 14:57
SB-2021-054:0.5-10042021	21J0060-29	Solid	04-Oct-2021 11:25	04-Oct-2021 14:57
SB-2021-054:2.5-10042021	21J0060-30	Solid	04-Oct-2021 11:25	04-Oct-2021 14:57
SB-2021-054:5.9-10042021	21J0060-31	Solid	04-Oct-2021 11:30	04-Oct-2021 14:57
SB-2021-054:7.0-10042021	21J0060-32	Solid	04-Oct-2021 11:30	04-Oct-2021 14:57
SB-2021-055:0.5-10042021	21J0060-33	Solid	04-Oct-2021 11:45	04-Oct-2021 14:57
SB-2021-055:2.2-10042021	21J0060-34	Solid	04-Oct-2021 11:45	04-Oct-2021 14:57
SB-2021-055:5.5-10042021	21J0060-35	Solid	04-Oct-2021 11:50	04-Oct-2021 14:57
SB-2021-055:7.5-10042021	21J0060-36	Solid	04-Oct-2021 11:50	04-Oct-2021 14:57
SB-2021-056:1.0-10042021	21J0060-37	Solid	04-Oct-2021 12:00	04-Oct-2021 14:57
SB-2021-056:2.5-10042021	21J0060-38	Solid	04-Oct-2021 12:00	04-Oct-2021 14:57
SB-2021-056:5.5-10042021	21J0060-39	Solid	04-Oct-2021 12:05	04-Oct-2021 14:57
SB-2021-056:7.7-10042021	21J0060-40	Solid	04-Oct-2021 12:05	04-Oct-2021 14:57
SB-2021-057:0.8-10042021	21J0060-43	Solid	04-Oct-2021 12:30	04-Oct-2021 14:57


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021

Project Number: 21-1-12596

Project Manager: Meg Strong

Reported:

19-Nov-2021 16:59

SB-2021-057:2.4-10042021	21J0060-44	Solid	04-Oct-2021 12:30	04-Oct-2021 14:57
SB-2021-057:5.5-10042021	21J0060-45	Solid	04-Oct-2021 12:45	04-Oct-2021 14:57
SB-2021-057:7.5-10042021	21J0060-46	Solid	04-Oct-2021 12:45	04-Oct-2021 14:57
SB-2021-Dup	21J0060-49	Solid	04-Oct-2021 00:00	04-Oct-2021 14:57
Drum-Comp-10042021	21J0060-50	Solid	04-Oct-2021 14:25	04-Oct-2021 14:57



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Soils 2021
Work Order: 21J0060

Sample receipt

Samples as listed on the preceding page were received 04-Oct-2021 14:57 under ARI work order 21J0060. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

All samples were screened prior to extraction. Samples 21J0060-10 and 21J0060-24 showed concentration higher than instrument capability for the low level. These samples were switched to medium level.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except as follows. Decachlorobiphenyl was out of control high on both columns in samples 21J0060-01 and 21J0060-13. Decachlorobiphenyl was out of control high on column 1 in samples 21J0060-15, 21K0060-33, 21J0060-37, as well as matrix spike and matrix spike duplicate (BJJ0466-MS1/BJJ0466-MSD1). Decachlorobiphenyl was out of control high on column 2 in samples 21J0060-02 and 21J0060-44. Tetrachlormetaxylene was out of control low on both columns in sample 21J0060-05. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21J0060-15 in batch BJJ0466, in association with sample 21J0060-34 in batch BJJ0467 and in association with sample 21J0060-10 in batch BJJ0471. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits except Aroclor 1260 which was out of control low in MS/MSD BJJ0471-MS1/BJJ0471-MSD1. Deviations have been flagged.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021

Project Number: 21-1-12596

Project Manager: Meg Strong

Reported:

19-Nov-2021 16:59

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21J0060-01 in batch BJJ0428, in association with sample 21J0060-31 in batch BJJ0429, in association with sample 21J0060-44 in batch BJJ0430 and in association with sample 21J0060-09 in batch BJJ448. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits except as follows. BJJ0428-MS1, BJJ0428-MSD1, BJJ0430-MSD1 were out of control high and BJJ0430-MS1 was out of control low. Deviations have been flagged.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: LDW

COC No(s): _____ NA

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

Assigned ARI Job No: 21J0060

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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 1555 1457

6.0 2.7

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO2565

Cooler Accepted by: [Signature] Date: 10/4/21 Time: 1457

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

How were bottles sealed in plastic bags? Individually Grouped Not

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

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: [Signature] Date: 10/05/2021 Time: 1428 Labels checked by: [Signature]

**** 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: _____


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-048:1.5-10042021
21J0060-01 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:05

Instrument: FID4 Analyst: TWC

Analyzed: 10/23/2021 09:42

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.05 g (wet)	Extract ID: 21J0060-01 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 8.94 g
	Prepared: 10/15/2021		% Solids: 88.91

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.60	351	mg/kg	E
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.2	830	mg/kg	E
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	53.7	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-048:1.5-10042021
21J0060-01 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:05

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 20:06

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 14.09 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-01 A 02 Dry Weight: 12.53 g % Solids: 88.91
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-01 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-01 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-01 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.6	39.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.6	39.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.6	39.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.6	39.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.6	39.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.6	39.9	49.0	ug/kg	D
Aroclor 1260	11096-82-5	10	5.9	39.9	ND	ug/kg	U
Aroclor 1262	37324-23-5	10	5.9	39.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	10	5.9	39.9	571	ug/kg	P1, D
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	229	%	*
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	73.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	172	%	*
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	74.4	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-048:1.5-10042021
21J0060-01RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:05

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 16:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-01RE1 A 01
	Preparation Batch: BJJ0428	Dry Weight: 8.94 g
	Prepared: 10/15/2021	% Solids: 88.91
	Sample Size: 10.05 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	28.0	314	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	5	56.0	996	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	51.1	%	


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 Project: Lower Duwamish Soils 2021
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Reported:
 19-Nov-2021 16:59

SB-2021-048:2.2-10042021
21J0060-02 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:15

Instrument: FID4 Analyst: TWC

Analyzed: 10/23/2021 10:42

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.11 g (wet)	Extract ID: 21J0060-02 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 9.25 g
	Prepared: 10/15/2021		% Solids: 91.51

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.40	477	mg/kg	E
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	10.8	914	mg/kg	E
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	82.8	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-048:2.2-10042021
21J0060-02 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:15

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 20:27

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 5 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-02 A 02 Dry Weight: 4.58 g % Solids: 91.51
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-02 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-02 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-02 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	426	1090	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	426	1090	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	426	1090	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	426	1090	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	426	1090	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	426	1090	ND	ug/kg	U
Aroclor 1260	11096-82-5	100	161	1090	9870	ug/kg	D
Aroclor 1262	37324-23-5	100	161	1090	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	161	1090	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	109	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	64.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	127	%	*
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	95.4	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-048:2.2-10042021
21J0060-02RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:15

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 16:34

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-02RE1 A 01
	Preparation Batch: BJJ0428	Dry Weight: 9.25 g
	Prepared: 10/15/2021	% Solids: 91.51
	Sample Size: 10.11 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	27.0	409	mg/kg	D
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	5	54.0	1030	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	71.6	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-048:6-10042021
21J0060-03 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:20

Instrument: FID4 Analyst: TWC

Analyzed: 10/23/2021 11:02

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.07 g (wet)	Extract ID: 21J0060-03 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 8.43 g
	Prepared: 10/15/2021		% Solids: 83.76

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.93	65.9	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.9	201	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	71.7	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-048:6-10042021
21J0060-03 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:20

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 20:48

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 14.92 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-03 A 02 Dry Weight: 12.50 g % Solids: 83.76
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-03 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-03 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-03 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.6	40.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.6	40.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.6	40.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.6	40.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.6	40.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.6	40.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	10	5.9	40.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	10	5.9	40.0	49.9	ug/kg	D
Aroclor 1268	11100-14-4	10	5.9	40.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	94.0	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	76.4	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	66.4	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	80.9	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-048:6-10042021
21J0060-03RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:20

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 16:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-03RE1 A 01
	Preparation Batch: BJJ0428	Dry Weight: 8.43 g
	Prepared: 10/15/2021	% Solids: 83.76
	Sample Size: 10.07 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.93	69.7	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	11.9	236	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	77.9	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-048:8.5-10042021
21J0060-04 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:20

Instrument: FID4 Analyst: TWC

Analyzed: 10/23/2021 11:22

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-04 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 7.78 g
	Prepared: 10/15/2021		% Solids: 77.79

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.43	145	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	12.9	266	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	84.3	%	


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 19-Nov-2021 16:59

SB-2021-048:8.5-10042021
21J0060-04 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:20

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 00:37

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 16.07 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-04 A 02 Dry Weight: 12.50 g % Solids: 77.79
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-04 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-04 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-04 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	7.8	ug/kg	P1
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	94.3 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	77.8 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	67.0 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	53.6 %	


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 19-Nov-2021 16:59

SB-2021-048:8.5-10042021
21J0060-04RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:20

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 17:14

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-04RE1 A 01
	Preparation Batch: BJJ0428	Dry Weight: 7.78 g
	Prepared: 10/15/2021	% Solids: 77.79
	Sample Size: 10 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.43	152	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	12.9	307	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	90.9	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-049:1-10042021
21J0060-05 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:30

Instrument: FID4 Analyst: TWC

Analyzed: 10/23/2021 11:42

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.12 g (wet)	Extract ID: 21J0060-05 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 8.83 g
	Prepared: 10/15/2021		% Solids: 87.30

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.66	191	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.3	475	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	88.6	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-049:1-10042021
21J0060-05 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 21:30

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 5 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-05 A 02 Dry Weight: 4.37 g % Solids: 87.30
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-05 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-05 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-05 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	44.7	115	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	44.7	115	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	44.7	115	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	44.7	115	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	44.7	115	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	44.7	115	138	ug/kg	D
Aroclor 1260	11096-82-5	10	16.9	115	ND	ug/kg	U
Aroclor 1262	37324-23-5	10	16.9	115	ND	ug/kg	U
Aroclor 1268	11100-14-4	10	16.9	115	477	ug/kg	D
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	49.9	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	6.18	%	*
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	41.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	7.41	%	*


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-049:1-10042021
21J0060-05RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:30

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 17:34

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-05RE1 A 01
	Preparation Batch: BJJ0428	Dry Weight: 8.83 g
	Prepared: 10/15/2021	% Solids: 87.30
	Sample Size: 10.12 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	28.3	184	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	5	56.6	560	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	93.3	%	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-049:2.2-10042021
21J0060-06 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:32

Instrument: FID4 Analyst: TWC

Analyzed: 10/23/2021 12:02

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-06 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 8.58 g
	Prepared: 10/15/2021		% Solids: 85.76

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.83	474	mg/kg	E
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.7	935	mg/kg	E
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	69.2	%	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-049:2.2-10042021
21J0060-06 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:32

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 21:50

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 2.5 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-06 A 02 Dry Weight: 2.14 g % Solids: 85.76
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-06 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-06 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-06 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	910	2330	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	910	2330	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	910	2330	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	910	2330	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	910	2330	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	910	2330	10700	ug/kg	D
Aroclor 1260	11096-82-5	100	343	2330	1540	ug/kg	J, D
Aroclor 1262	37324-23-5	100	343	2330	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	343	2330	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	98.2	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	57.7	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	104	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	66.8	%	


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Reported:
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SB-2021-049:2.2-10042021
21J0060-06RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:32

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 17:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-06RE1 A 01
	Preparation Batch: BJJ0428	Dry Weight: 8.58 g
	Prepared: 10/15/2021	% Solids: 85.76
	Sample Size: 10 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	29.2	493	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	5	58.3	1190	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	77.8	%	


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Reported:
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SB-2021-049:6.5-10042021
21J0060-07 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:35

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 18:55

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.07 g (wet)	Extract ID: 21J0060-07 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 8.21 g
	Prepared: 10/15/2021		% Solids: 81.55

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	30.4	302	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	5	60.9	459	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	77.3	%	


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Reported:
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SB-2021-049:6.5-10042021
21J0060-07 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:35

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 22:11

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 15.33 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-07 A 02 Dry Weight: 12.50 g % Solids: 81.55
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-07 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-07 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-07 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.6	40.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.6	40.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.6	40.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.6	40.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.6	40.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.6	40.0	205	ug/kg	D
Aroclor 1260	11096-82-5	10	5.9	40.0	99.0	ug/kg	D
Aroclor 1262	37324-23-5	10	5.9	40.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	10	5.9	40.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	95.9	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	75.3	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	65.7	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	74.8	%	


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Reported:
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SB-2021-049:7.5-10042021
21J0060-08 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:40

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 19:15

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-08 A 01
	Preparation Batch: BJJ0428	Dry Weight: 7.44 g
	Prepared: 10/15/2021	% Solids: 74.30
	Sample Size: 10.02 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	33.6	304	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	5	67.2	437	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	87.1	%	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Soils 2021
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Reported:
19-Nov-2021 16:59

SB-2021-049:7.5-10042021
21J0060-08 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:40

Instrument: ECD7 Analyst: JGR

Analyzed: 11/14/2021 15:04

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 16.89 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-08 A 02 Dry Weight: 12.55 g % Solids: 74.30
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-08 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-08 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-08 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	4.3	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	36.9	ug/kg	P1
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	122	%
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	67.0	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	87.0	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	57.3	%


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-050:0.5-10042021
21J0060-09 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:50

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 18:53

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-09 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 9.63 g
	Prepared: 10/18/2021		% Solids: 96.33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.19	38.9	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	10.4	186	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	78.5	%	



Analytical Report

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Reported:
19-Nov-2021 16:59

SB-2021-050:0.5-10042021
21J0060-09 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:50

Instrument: ECD7 Analyst: JGR

Analyzed: 11/11/2021 16:10

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic) Preparation Batch: BJJ0467 Prepared: 10/18/2021	Sample Size: 12.99 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-09 A 02 Dry Weight: 12.51 g % Solids: 96.33
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0134 Cleaned: 10-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-09 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0132 Cleaned: 10-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-09 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0133 Cleaned: 10-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-09 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	9.8	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	28.7	ug/kg	
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	85.7 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	62.0 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	66.5 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	55.6 %	


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SB-2021-050:2.5-10042021
21J0060-10 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 09:50

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 19:35

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-10 A 01
	Preparation Batch: BJJ0428	Dry Weight: 7.51 g
	Prepared: 10/15/2021	% Solids: 75.00
	Sample Size: 10.01 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	50	333	3800	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	50	666	4770	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %		D1	D1


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 19-Nov-2021 16:59

SB-2021-050:2.5-10042021
21J0060-10 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 09:50

Instrument: ECD7 Analyst: JGR

Analyzed: 11/10/2021 16:08

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3580A (Vortex) Preparation Batch: BJJ0471 Prepared: 10/18/2021	Sample Size: 1 g (wet) Final Volume: 40 mL	Extract ID: 21J0060-10 A 02 Dry Weight: 0.75 g % Solids: 75.00
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0093 Cleaned: 08-Nov-2021	Initial Volume: 40 mL Final Volume: 40 mL	Extract ID: 21J0060-10 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0091 Cleaned: 08-Nov-2021	Initial Volume: 40 uL Final Volume: 40 uL	Extract ID: 21J0060-10 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0092 Cleaned: 08-Nov-2021	Initial Volume: 40 uL Final Volume: 40 uL	Extract ID: 21J0060-10 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	25	1270	26700	ND	ug/kg	U
Aroclor 1221	11104-28-2	25	1270	26700	ND	ug/kg	U
Aroclor 1232	11141-16-5	25	1270	26700	ND	ug/kg	U
Aroclor 1242	53469-21-9	25	1270	26700	ND	ug/kg	U
Aroclor 1248	12672-29-6	25	1270	26700	ND	ug/kg	U
Aroclor 1254	11097-69-1	25	1270	26700	ND	ug/kg	U
Aroclor 1260	11096-82-5	25	2440	26700	447000	ug/kg	D
Aroclor 1262	37324-23-5	25	2440	26700	ND	ug/kg	U
Aroclor 1268	11100-14-4	25	2440	26700	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				67-145 %	129	%	
<i>Surrogate: Tetrachlorometaxylene</i>				69-120 %	95.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				67-145 %	109	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				69-120 %	114	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-050:6.5-10042021
21J0060-11 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:00

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 19:56

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-11 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 7.69 g
	Prepared: 10/15/2021		% Solids: 76.88

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.50	16.1	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.0	37.5	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	90.6	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-050:6.5-10042021
21J0060-11 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:00

Instrument: ECD7 Analyst: JGR

Analyzed: 11/13/2021 22:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 16.29 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-11 A 02 Dry Weight: 12.52 g % Solids: 76.88
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-11 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-11 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-11 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.6	39.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.6	39.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.6	39.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.6	39.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.6	39.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.6	39.9	ND	ug/kg	U
Aroclor 1260	11096-82-5	10	5.9	39.9	539	ug/kg	D
Aroclor 1262	37324-23-5	10	5.9	39.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	10	5.9	39.9	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	86.7	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	57.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	71.0	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	68.0	%	


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-050:7.5-10042021
21J0060-12 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:00

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 20:16

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.1 g (wet)	Extract ID: 21J0060-12 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 7.71 g
	Prepared: 10/15/2021		% Solids: 76.35

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.48	13.8	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.0	44.2	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	83.8	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-050:7.5-10042021
21J0060-12 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:00

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 00:58

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 16.38 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-12 A 02 Dry Weight: 12.51 g % Solids: 76.35
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-12 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-12 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-12 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	10.4	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	33.6	ug/kg	
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	104	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	76.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	83.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	71.4	%	


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Reported:
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SB-2021-051:1.2-10042021
21J0060-13 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:10

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 20:36

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-13 A 01
	Preparation Batch: BJJ0428	Dry Weight: 8.90 g
	Prepared: 10/15/2021	% Solids: 88.62
	Sample Size: 10.04 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.62	68.4	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.2	166	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	88.3	%	


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Reported:
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SB-2021-051:1.2-10042021
21J0060-13 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:10

Instrument: ECD7 Analyst: JGR

Analyzed: 11/14/2021 00:17

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 14.12 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-13 A 02 Dry Weight: 12.51 g % Solids: 88.62
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-13 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-13 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-13 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.6	40.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.6	40.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.6	40.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.6	40.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.6	40.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.6	40.0	227	ug/kg	D
Aroclor 1260	11096-82-5	10	5.9	40.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	10	5.9	40.0	744	ug/kg	D
Aroclor 1268	11100-14-4	10	5.9	40.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	156	%	*
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	73.6	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	136	%	*
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	71.3	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-051:2.4-10042021
21J0060-14 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:15

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 20:56

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-14 A 01
	Preparation Batch: BJJ0428	Final Volume: 1 mL	Dry Weight: 7.94 g
	Prepared: 10/15/2021		% Solids: 79.41

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.30	17.0	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	12.6	40.5	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	91.2	%	


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Reported:
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SB-2021-051:2.4-10042021
21J0060-14 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:15

Instrument: ECD7 Analyst: JGR

Analyzed: 11/14/2021 00:38

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0434 Prepared: 10/15/2021	Sample Size: 15.75 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-14 A 02 Dry Weight: 12.51 g % Solids: 79.41
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0155 Cleaned: 12-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-14 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0153 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-14 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0154 Cleaned: 12-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-14 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	156	400	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	156	400	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	156	400	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	156	400	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	156	400	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	156	400	ND	ug/kg	U
Aroclor 1260	11096-82-5	100	58.9	400	4770	ug/kg	D
Aroclor 1262	37324-23-5	100	58.9	400	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	58.9	400	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	117	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	64.1	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	109	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	63.9	%	


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Reported:
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SB-2021-051:6.5-10042021
21J0060-15 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:20

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 22:57

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-15 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.64 g
	Prepared: 10/15/2021		% Solids: 76.37

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.55	21.2	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.1	47.1	mg/kg	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	87.2	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-051:6.5-10042021
21J0060-15 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:20

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 04:55

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 16.42 g (wet)	Extract ID: 21J0060-15 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.54 g
	Prepared: 10/18/2021		% Solids: 76.37
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-15 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-15 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-15 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	19.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	19.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	19.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	19.9	53.1	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	19.9	120	ug/kg	D
Aroclor 1262	37324-23-5	5	2.9	19.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	5	2.9	19.9	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	127	%	*
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	77.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	112	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	79.7	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-051:8.0-10042021
21J0060-16 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:20

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 23:17

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-16 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.30 g
	Prepared: 10/15/2021		% Solids: 73.01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.85	26.9	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.7	57.7	mg/kg	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	82.0	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-051:8.0-10042021
21J0060-16 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:20

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 06:00

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 17.2 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-16 A 02 Dry Weight: 12.56 g % Solids: 73.01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-16 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-16 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-16 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	10.9	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	33.0	ug/kg	P1
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	104	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	84.4	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	84.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	77.0	%	


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Reported:
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SB-2021-051:10.5-10042021
21J0060-17 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:25

Instrument: FID4 Analyst: CTO

Analyzed: 10/25/2021 23:37

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-17 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.52 g
	Prepared: 10/15/2021		% Solids: 75.16

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.65	73.7	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.3	112	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	77.7	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-051:10.5-10042021
21J0060-17 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:25

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 06:21

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 16.7 g (wet)	Extract ID: 21J0060-17 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.55 g
	Prepared: 10/18/2021		% Solids: 75.16
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-17 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-17 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-17 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	19.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	19.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	19.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	19.9	58.1	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	19.9	165	ug/kg	D
Aroclor 1262	37324-23-5	5	2.9	19.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	5	2.9	19.9	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	87.7	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	69.7	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	64.9	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	69.0	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-051:12.5-10042021
21J0060-18 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:30

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 23:57

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-18 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.81 g
	Prepared: 10/15/2021		% Solids: 78.13

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.40	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	12.8	ND	mg/kg	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	98.1	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-051:12.5-10042021
21J0060-18 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 06:43

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.11 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-18 A 02 Dry Weight: 12.59 g % Solids: 78.13
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-18 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-18 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-18 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.5	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.5	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.5	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.5	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.5	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.5	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	1.9	ug/kg	J
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	91.9	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	79.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	92.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	69.7	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-052:0.1-10042021
21J0060-19 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:40

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 00:17

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-19 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 8.65 g
	Prepared: 10/15/2021		% Solids: 86.53

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.78	64.6	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	11.6	256	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	79.4	%	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-052:0.1-10042021
21J0060-19 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:40

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 07:04

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 14.52 g (wet)	Extract ID: 21J0060-19 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.56 g
	Prepared: 10/18/2021		% Solids: 86.53
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-19 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-19 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-19 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	59.3	ug/kg	P1
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	92.2	%
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	74.1	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	72.6	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	64.7	%



Analytical Resources, LLC
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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-052:2.4-10042021

21J0060-20 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:40

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 00:37

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-20 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.86 g
	Prepared: 10/15/2021		% Solids: 78.61

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.36	24.2	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	12.7	82.1	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	83.6	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-052:2.4-10042021
21J0060-20 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:40

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 08:09

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 15.96 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-20 A 02 Dry Weight: 12.55 g % Solids: 78.61
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-20 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-20 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-20 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	9.4	ug/kg	P1
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	91.1	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	77.3	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	69.4	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	68.3	%	


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 Project: Lower Duwamish Soils 2021
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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-052:6.0-10042021
21J0060-21 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:45

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 00:57

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3546 (Microwave)

Extract ID: 21J0060-21 A 01

Preparation Batch: BJJ0429

Sample Size: 10 g (wet)

Dry Weight: 7.52 g

Prepared: 10/15/2021

Final Volume: 1 mL

% Solids: 75.17

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.65	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	13.3	20.8	mg/kg	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	85.8	%	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-052:6.0-10042021
21J0060-21 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 08:30

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.7 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-21 A 02 Dry Weight: 12.55 g % Solids: 75.17
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-21 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-21 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-21 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	0.7	ug/kg	J
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	95.2 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	79.7 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	83.9 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	73.9 %	


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 Project: Lower Duwamish Soils 2021
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Reported:
 19-Nov-2021 16:59

SB-2021-052:7.7-10042021
21J0060-22 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:45

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 01:17

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-22 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.57 g
	Prepared: 10/15/2021		% Solids: 75.65

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.61	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	13.2	30.5	mg/kg	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	91.3	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-052:7.7-10042021
21J0060-22 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 08:52

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 16.58 g (wet)	Extract ID: 21J0060-22 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.54 g
	Prepared: 10/18/2021		% Solids: 75.65
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-22 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-22 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-22 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	4.7	ug/kg	

Surrogate: Decachlorobiphenyl

40-126 % 101 %

Surrogate: Tetrachlorometaxylene

44-120 % 82.9 %

Surrogate: Decachlorobiphenyl [2C]

40-126 % 88.8 %

Surrogate: Tetrachlorometaxylene [2C]

44-120 % 75.2 %



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-053:1.0-10042021
21J0060-23 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:55

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 01:38

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-23 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 8.92 g
	Prepared: 10/15/2021		% Solids: 89.17

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.61	27.7	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	11.2	90.1	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	95.5	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-053:1.0-10042021
21J0060-23 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:55

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 09:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 14.1 g (wet)	Extract ID: 21J0060-23 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.57 g
	Prepared: 10/18/2021		% Solids: 89.17
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-23 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-23 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-23 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	10	15.5	39.8	ND	ug/kg	U
Aroclor 1221	11104-28-2	10	15.5	39.8	ND	ug/kg	U
Aroclor 1232	11141-16-5	10	15.5	39.8	ND	ug/kg	U
Aroclor 1242	53469-21-9	10	15.5	39.8	ND	ug/kg	U
Aroclor 1248	12672-29-6	10	15.5	39.8	ND	ug/kg	U
Aroclor 1254	11097-69-1	10	15.5	39.8	94.8	ug/kg	D
Aroclor 1260	11096-82-5	10	5.9	39.8	ND	ug/kg	U
Aroclor 1262	37324-23-5	10	5.9	39.8	359	ug/kg	D
Aroclor 1268	11100-14-4	10	5.9	39.8	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	125	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	71.3	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	109	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	73.3	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-053:2.8-10042021
21J0060-24 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:55

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 01:58

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-24 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 8.46 g
	Prepared: 10/15/2021		% Solids: 84.61

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	5	29.5	2010	mg/kg	D, E
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	5	59.1	3240	mg/kg	D, E
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	70.2	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-053:2.8-10042021
21J0060-24 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 10:55

Instrument: ECD7 Analyst: JGR

Analyzed: 11/10/2021 17:09

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3580A (Vortex)	Sample Size: 1 g (wet)	Extract ID: 21J0060-24 A 02
	Preparation Batch: BJJ0471	Final Volume: 40 mL	Dry Weight: 0.85 g
	Prepared: 10/18/2021		% Solids: 84.61
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 40 mL	Extract ID: 21J0060-24 A 02
	Cleanup Batch: CJK0093	Final Volume: 40 mL	
	Cleaned: 08-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 40 uL	Extract ID: 21J0060-24 A 02
	Cleanup Batch: CJK0091	Final Volume: 40 uL	
	Cleaned: 08-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 40 uL	Extract ID: 21J0060-24 A 02
	Cleanup Batch: CJK0092	Final Volume: 40 uL	
	Cleaned: 08-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	4510	94600	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	4510	94600	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	4510	94600	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	4510	94600	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	4510	94600	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	4510	94600	ND	ug/kg	U
Aroclor 1260	11096-82-5	100	8640	94600	998000	ug/kg	D
Aroclor 1262	37324-23-5	100	8640	94600	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	8640	94600	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				67-145 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene</i>				69-120 %		D1	D1
<i>Surrogate: Decachlorobiphenyl [2C]</i>				67-145 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				69-120 %		D1	D1


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-053:2.8-10042021
21J0060-24RE1 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 10:55

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 12:41

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-24RE1 A 01
	Preparation Batch: BJJ0429	Dry Weight: 8.46 g
	Prepared: 10/15/2021	% Solids: 84.61
	Sample Size: 10 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	10	59.1	2030	mg/kg	D
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	10	118	3030	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	77.3	%	


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 Project Number: 21-1-12596
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Reported:
 19-Nov-2021 16:59

SB-2021-053:11.0-10042021
21J0060-27 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:10

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 02:58

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-27 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 8.06 g
	Prepared: 10/15/2021		% Solids: 80.55

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.21	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	12.4	ND	mg/kg	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	93.9	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-053:11.0-10042021
21J0060-27 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:10

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 09:35

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 15.57 g (wet)	Extract ID: 21J0060-27 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.54 g
	Prepared: 10/18/2021		% Solids: 80.55
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-27 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-27 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-27 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	19.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	19.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	19.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	19.9	341	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	19.9	755	ug/kg	D
Aroclor 1262	37324-23-5	5	2.9	19.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	5	2.9	19.9	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	93.6	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	75.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	88.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	76.6	%	


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Reported:
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SB-2021-053:13.0-10042021
21J0060-28 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:10

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 03:18

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-28 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.68 g
	Prepared: 10/15/2021		% Solids: 76.80

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.51	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	13.0	ND	mg/kg	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>95.1</i>	<i>%</i>	



Analytical Report

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Project: Lower Duwamish Soils 2021
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Reported:
19-Nov-2021 16:59

SB-2021-053:13.0-10042021
21J0060-28 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:10

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 09:56

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.35 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-28 A 02 Dry Weight: 12.56 g % Solids: 76.80
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-28 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-28 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-28 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	2.8	ug/kg	J
Aroclor 1260	11096-82-5	1	0.6	4.0	6.6	ug/kg	
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	89.3 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	74.3 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	90.0 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	67.6 %	


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Reported:
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SB-2021-054:0.5-10042021
21J0060-29 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:25

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 19:53

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-29 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 9.31 g
	Prepared: 10/18/2021		% Solids: 93.08

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.37	24.0	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	10.7	243	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	88.4	%	



Analytical Report

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Project: Lower Duwamish Soils 2021
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Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-054:0.5-10042021
21J0060-29 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:25

Instrument: ECD7 Analyst: JGR

Analyzed: 11/11/2021 16:31

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic) Preparation Batch: BJJ0467 Prepared: 10/18/2021	Sample Size: 13.45 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-29 A 02 Dry Weight: 12.52 g % Solids: 93.08
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0134 Cleaned: 10-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-29 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0132 Cleaned: 10-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-29 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0133 Cleaned: 10-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-29 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	49.5	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	159	ug/kg	
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				40-126 %	105	%	
Surrogate: Tetrachlorometaxylene				44-120 %	79.6	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	78.2	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	80.5	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-054:2.5-10042021
21J0060-30 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:25

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 03:38

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-30 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.77 g
	Prepared: 10/15/2021		% Solids: 77.65

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.44	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	12.9	22.1	mg/kg	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	91.2	%	



Analytical Report

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Reported:
19-Nov-2021 16:59

SB-2021-054:2.5-10042021
21J0060-30 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:25

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 10:18

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.18 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-30 A 02 Dry Weight: 12.56 g % Solids: 77.65
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-30 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-30 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-30 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	1.8	ug/kg	J
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	3.1	ug/kg	J
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	88.3 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	71.7 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	73.3 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	67.0 %	


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Reported:
 19-Nov-2021 16:59

SB-2021-054:5.9-10042021
21J0060-31 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:30

Instrument: FID4 Analyst: CTO

Analyzed: 10/26/2021 03:58

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-31 A 01
	Preparation Batch: BJJ0429	Final Volume: 1 mL	Dry Weight: 7.53 g
	Prepared: 10/15/2021		% Solids: 75.33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.64	6.76	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.3	27.9	mg/kg	
HC ID: RRO						
Surrogate: o-Terphenyl			50-150 %	92.2	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-054:5.9-10042021
21J0060-31 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 10:39

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.65 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-31 A 02 Dry Weight: 12.54 g % Solids: 75.33
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-31 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-31 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-31 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	5.0	ug/kg	
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	99.0	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	80.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	78.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	73.3	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-054:7.0-10042021
21J0060-32 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:30

Instrument: FID4 Analyst: TWC

Analyzed: 11/04/2021 08:05

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-32 A 01
	Preparation Batch: BJJ0430	Dry Weight: 7.42 g
	Prepared: 10/15/2021	% Solids: 73.77
	Sample Size: 10.06 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.74	15.2	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.5	83.7	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	75.4	%	


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 19-Nov-2021 16:59

SB-2021-054:7.0-10042021
21J0060-32 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 11:01

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 16.99 g (wet)	Extract ID: 21J0060-32 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.53 g
	Prepared: 10/18/2021		% Solids: 73.77
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-32 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-32 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-32 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	23.5	ug/kg	
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	113	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	73.7	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	95.4	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	67.4	%	


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-055:0.5-10042021
21J0060-33 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:45

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 20:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-33 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 9.27 g
	Prepared: 10/18/2021		% Solids: 92.67

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.40	16.2	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	10.8	66.8	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	89.6	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-055:0.5-10042021
21J0060-33 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/12/2021 11:59

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 13.5 g (wet)	Extract ID: 21J0060-33 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.51 g
	Prepared: 10/18/2021		% Solids: 92.67
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-33 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-33 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-33 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	20.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	20.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	20.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	20.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	20.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	20.0	238	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	20.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	5	2.9	20.0	365	ug/kg	D
Aroclor 1268	11100-14-4	5	2.9	20.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	133	%	*
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	83.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	111	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	84.6	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-055:2.2-10042021
21J0060-34 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:45

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 20:33

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Extract ID: 21J0060-34 A 01
	Preparation Batch: BJJ0448	Dry Weight: 8.93 g
	Prepared: 10/18/2021	% Solids: 89.25
	Sample Size: 10 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.60	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	11.2	ND	mg/kg	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	97.9	%	


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 Project Manager: Meg Strong

Reported:
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SB-2021-055:2.2-10042021
21J0060-34 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/11/2021 17:14

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 14.09 g (wet)	Extract ID: 21J0060-34 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.58 g
	Prepared: 10/18/2021		% Solids: 89.25
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-34 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-34 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-34 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	2.7	ug/kg	J
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	91.2	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	74.7	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	74.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	71.0	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-055:5.5-10042021
21J0060-35 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:50

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 20:53

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-35 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 8.19 g
	Prepared: 10/18/2021		% Solids: 81.94

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.10	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	12.2	24.6	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	95.7	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-055:5.5-10042021
21J0060-35 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:50

Instrument: ECD7 Analyst: JGR

Analyzed: 11/11/2021 18:19

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 15.31 g (wet)	Extract ID: 21J0060-35 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.55 g
	Prepared: 10/18/2021		% Solids: 81.94
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-35 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-35 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-35 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	8.4	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	22.8	ug/kg	
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	98.8 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	77.6 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	85.9 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	72.8 %	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-055:7.5-10042021
21J0060-36 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 11:50

Instrument: FID4 Analyst: TWC

Analyzed: 11/04/2021 08:25

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-36 A 01
	Preparation Batch: BJJ0430	Final Volume: 1 mL	Dry Weight: 7.57 g
	Prepared: 10/15/2021		% Solids: 75.73

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.60	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	13.2	45.2	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	81.3	%	



Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-055:7.5-10042021
21J0060-36 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 11:50

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 11:22

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.58 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-36 A 02 Dry Weight: 12.56 g % Solids: 75.73
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-36 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-36 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-36 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	1.2	ug/kg	J
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	89.8 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	72.9 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	75.3 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	67.1 %	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-056:1.0-10042021
21J0060-37 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:00

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 21:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-37 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 8.60 g
	Prepared: 10/18/2021		% Solids: 85.98

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.82	32.4	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.6	121	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	85.6	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-056:1.0-10042021
21J0060-37 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:00

Instrument: ECD7 Analyst: JGR

Analyzed: 11/12/2021 12:20

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 14.55 g (wet)	Extract ID: 21J0060-37 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.51 g
	Prepared: 10/18/2021		% Solids: 85.98
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-37 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-37 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-37 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	20.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	20.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	20.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	20.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	20.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	20.0	156	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	20.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	5	2.9	20.0	429	ug/kg	D
Aroclor 1268	11100-14-4	5	2.9	20.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	141	%	*
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	68.1	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	114	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	74.7	%	


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 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-056:2.5-10042021
21J0060-38 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:00

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 21:33

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Extract ID: 21J0060-38 A 01
	Preparation Batch: BJJ0448	Dry Weight: 7.94 g
	Prepared: 10/18/2021	% Solids: 79.38
	Sample Size: 10 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.30	36.3	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	12.6	77.8	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	86.0	%	


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Reported:
 19-Nov-2021 16:59

SB-2021-056:2.5-10042021
21J0060-38 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:00

Instrument: ECD7 Analyst: JGR

Analyzed: 11/12/2021 13:01

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 15.81 g (wet)	Extract ID: 21J0060-38 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.55 g
	Prepared: 10/18/2021		% Solids: 79.38
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-38 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-38 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-38 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	155	398	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	155	398	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	155	398	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	155	398	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	155	398	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	155	398	5080	ug/kg	D
Aroclor 1260	11096-82-5	100	58.7	398	7740	ug/kg	D
Aroclor 1262	37324-23-5	100	58.7	398	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	58.7	398	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %		D1	D1
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %		D1	D1


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-056:5.5-10042021
21J0060-39 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:05

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 21:53

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-39 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 8.24 g
	Prepared: 10/18/2021		% Solids: 82.43

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.07	13.3	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	12.1	44.0	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	94.8	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
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SB-2021-056:5.5-10042021
21J0060-39 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:05

Instrument: ECD7 Analyst: JGR

Analyzed: 11/11/2021 20:06

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 15.22 g (wet)	Extract ID: 21J0060-39 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.55 g
	Prepared: 10/18/2021		% Solids: 82.43
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-39 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-39 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-39 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	46.0	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	123	ug/kg	P1
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	86.0 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	64.5 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	69.4 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	59.3 %	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
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SB-2021-056:7.7-10042021
21J0060-40 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:05

Instrument: FID4 Analyst: TWC

Analyzed: 11/04/2021 08:46

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.1 g (wet)	Extract ID: 21J0060-40 A 01
	Preparation Batch: BJJ0430	Final Volume: 1 mL	Dry Weight: 7.57 g
	Prepared: 10/15/2021		% Solids: 74.96

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.60	10.0	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.2	45.7	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	74.4	%	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
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SB-2021-056:7.7-10042021
21J0060-40 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:05

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 12:27

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 16.79 g (wet)	Extract ID: 21J0060-40 A 02
	Preparation Batch: BJJ0466	Final Volume: 2.5 mL	Dry Weight: 12.59 g
	Prepared: 10/18/2021		% Solids: 74.96
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-40 A 02
	Cleanup Batch: CJK0181	Final Volume: 2.5 mL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-40 A 02
	Cleanup Batch: CJK0179	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-40 A 02
	Cleanup Batch: CJK0180	Final Volume: 2.5 uL	
	Cleaned: 16-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.5	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.5	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.5	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.5	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.5	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.5	4.0	5.1	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	9.4	ug/kg	
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					40-126 %	85.9 %	
<i>Surrogate: Tetrachlorometaxylene</i>					44-120 %	69.7 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					40-126 %	70.9 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					44-120 %	63.2 %	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
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SB-2021-057:0.8-10042021
21J0060-43 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:30

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 22:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-43 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 9.59 g
	Prepared: 10/18/2021		% Solids: 95.89

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.21	33.6	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	10.4	124	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	81.7	%	


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Reported:
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SB-2021-057:0.8-10042021
21J0060-43 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/11/2021 20:27

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 13.11 g (wet)	Extract ID: 21J0060-43 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.57 g
	Prepared: 10/18/2021		% Solids: 95.89
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-43 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-43 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-43 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	65.8	ug/kg	
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	142	ug/kg	P1
Aroclor 1268	11100-14-4	1	0.6	4.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	95.6	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	72.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	74.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	68.1	%	


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Reported:
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SB-2021-057:2.4-10042021
21J0060-44 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:30

Instrument: FID4 Analyst: TWC

Analyzed: 11/04/2021 09:06

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10.07 g (wet)	Extract ID: 21J0060-44 A 01
	Preparation Batch: BJJ0430	Final Volume: 1 mL	Dry Weight: 8.46 g
	Prepared: 10/15/2021		% Solids: 84.03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	20	118	3470	mg/kg	D
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	20	236	3340	mg/kg	D
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	74.7	%	D


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Reported:
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SB-2021-057:2.4-10042021
21J0060-44 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 12:48

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 14.98 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-44 A 02 Dry Weight: 12.59 g % Solids: 84.03
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-44 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-44 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-44 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	155	397	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	155	397	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	155	397	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	155	397	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	155	397	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	155	397	4380	ug/kg	D
Aroclor 1260	11096-82-5	100	58.5	397	14600	ug/kg	D
Aroclor 1262	37324-23-5	100	58.5	397	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	58.5	397	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %	103	%	
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %	61.5	%	P1
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %	146	%	*
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %	104	%	P1


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Reported:
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SB-2021-057:5.5-10042021
21J0060-45 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:45

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 22:33

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-45 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 8.45 g
	Prepared: 10/18/2021		% Solids: 84.49

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.92	31.3	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.8	36.3	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	105	%	


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Reported:
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SB-2021-057:5.5-10042021
21J0060-45 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/12/2021 13:22

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 14.84 g (wet)	Extract ID: 21J0060-45 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.54 g
	Prepared: 10/18/2021		% Solids: 84.49
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-45 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-45 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-45 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	25	38.9	99.7	ND	ug/kg	U
Aroclor 1221	11104-28-2	25	38.9	99.7	ND	ug/kg	U
Aroclor 1232	11141-16-5	25	38.9	99.7	ND	ug/kg	U
Aroclor 1242	53469-21-9	25	38.9	99.7	ND	ug/kg	U
Aroclor 1248	12672-29-6	25	38.9	99.7	ND	ug/kg	U
Aroclor 1254	11097-69-1	25	38.9	99.7	729	ug/kg	D
Aroclor 1260	11096-82-5	25	14.7	99.7	2070	ug/kg	D
Aroclor 1262	37324-23-5	25	14.7	99.7	ND	ug/kg	U
Aroclor 1268	11100-14-4	25	14.7	99.7	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %		D1	D1
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %		D1	D1


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Reported:
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SB-2021-057:7.5-10042021
21J0060-46 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 12:45

Instrument: FID4 Analyst: TWC

Analyzed: 11/04/2021 10:06

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 21J0060-46 A 01
	Preparation Batch: BJJ0430	Dry Weight: 7.71 g
	Prepared: 10/15/2021	% Solids: 76.50
	Sample Size: 10.08 g (wet)	
	Final Volume: 1 mL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	6.48	12.7	mg/kg	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	13.0	58.8	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	82.0	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-057:7.5-10042021
21J0060-46 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 12:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 13:10

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 16.38 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-46 A 02 Dry Weight: 12.53 g % Solids: 76.50
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-46 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-46 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-46 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	1.6	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	1.6	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	1.6	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	1.6	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	1.6	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	0.6	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	0.6	4.0	4.2	ug/kg	
Surrogate: Decachlorobiphenyl				40-126 %	95.6	%	
Surrogate: Tetrachlorometaxylene				44-120 %	77.6	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	76.6	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	71.2	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

SB-2021-Dup
21J0060-49 (Solid)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 00:00

Instrument: FID4 Analyst: TWC

Analyzed: 11/04/2021 10:26

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 10 g (wet)	Extract ID: 21J0060-49 A 01
	Preparation Batch: BJJ0430	Final Volume: 1 mL	Dry Weight: 8.42 g
	Prepared: 10/15/2021		% Solids: 84.24

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.94	26.7	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.9	53.2	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	80.4	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

SB-2021-Dup 21J0060-49 (Solid)

Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 00:00

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 13:31

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BJJ0466 Prepared: 10/18/2021	Sample Size: 14.88 g (wet) Final Volume: 2.5 mL	Extract ID: 21J0060-49 A 02 Dry Weight: 12.53 g % Solids: 84.24
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0181 Cleaned: 16-Nov-2021	Initial Volume: 2.5 mL Final Volume: 2.5 mL	Extract ID: 21J0060-49 A 02
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0179 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-49 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0180 Cleaned: 16-Nov-2021	Initial Volume: 2.5 uL Final Volume: 2.5 uL	Extract ID: 21J0060-49 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1221	11104-28-2	5	7.8	19.9	ND	ug/kg	U
Aroclor 1232	11141-16-5	5	7.8	19.9	ND	ug/kg	U
Aroclor 1242	53469-21-9	5	7.8	19.9	ND	ug/kg	U
Aroclor 1248	12672-29-6	5	7.8	19.9	ND	ug/kg	U
Aroclor 1254	11097-69-1	5	7.8	19.9	178	ug/kg	D
Aroclor 1260	11096-82-5	5	2.9	19.9	535	ug/kg	D
Aroclor 1262	37324-23-5	5	2.9	19.9	ND	ug/kg	U
Aroclor 1268	11100-14-4	5	2.9	19.9	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				40-126 %	102	%	
Surrogate: Tetrachlorometaxylene				44-120 %	73.6	%	
Surrogate: Decachlorobiphenyl [2C]				40-126 %	84.8	%	
Surrogate: Tetrachlorometaxylene [2C]				44-120 %	76.0	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

Drum-Comp-10042021
21J0060-50 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 10/04/2021 14:25

Instrument: FID4 Analyst: TWC

Analyzed: 11/09/2021 23:32

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 10 g (wet)	Extract ID: 21J0060-50 A 01
	Preparation Batch: BJJ0448	Final Volume: 1 mL	Dry Weight: 8.34 g
	Prepared: 10/18/2021		% Solids: 83.42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.99	137	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	12.0	290	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	89.2	%	


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Drum-Comp-10042021
21J0060-50 (Solid)
Aroclor PCB

Method: EPA 8082A

Sampled: 10/04/2021 14:25

Instrument: ECD7 Analyst: JGR

Analyzed: 11/12/2021 13:43

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 14.99 g (wet)	Extract ID: 21J0060-50 A 02
	Preparation Batch: BJJ0467	Final Volume: 2.5 mL	Dry Weight: 12.50 g
	Prepared: 10/18/2021		% Solids: 83.42
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 2.5 mL	Extract ID: 21J0060-50 A 02
	Cleanup Batch: CJK0134	Final Volume: 2.5 mL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfuric Acid	Initial Volume: 2.5 uL	Extract ID: 21J0060-50 A 02
	Cleanup Batch: CJK0132	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 2.5 uL	Extract ID: 21J0060-50 A 02
	Cleanup Batch: CJK0133	Final Volume: 2.5 uL	
	Cleaned: 10-Nov-2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	100	156	400	ND	ug/kg	U
Aroclor 1221	11104-28-2	100	156	400	ND	ug/kg	U
Aroclor 1232	11141-16-5	100	156	400	ND	ug/kg	U
Aroclor 1242	53469-21-9	100	156	400	ND	ug/kg	U
Aroclor 1248	12672-29-6	100	156	400	ND	ug/kg	U
Aroclor 1254	11097-69-1	100	156	400	4010	ug/kg	D
Aroclor 1260	11096-82-5	100	58.9	400	9130	ug/kg	D
Aroclor 1262	37324-23-5	100	58.9	400	ND	ug/kg	U
Aroclor 1268	11100-14-4	100	58.9	400	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				40-126 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene</i>				44-120 %		D1	D1
<i>Surrogate: Decachlorobiphenyl [2C]</i>				40-126 %		D1	D1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				44-120 %		D1	D1


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJJ0428 - EPA 3546 (Microwave)

Instrument: FID4 Analyst: CTO

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0428-BLK1)		Prepared: 15-Oct-2021 Analyzed: 25-Oct-2021 15:13								
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
<i>Surrogate: o-Terphenyl</i>	12.2		mg/kg	11.3		108	50-150			
LCS (BJJ0428-BS1)		Prepared: 15-Oct-2021 Analyzed: 25-Oct-2021 15:33								
Diesel Range Organics (C12-C24)	158	5.00	mg/kg	150		105	63-120			
<i>Surrogate: o-Terphenyl</i>	11.0		mg/kg	11.3		97.4	50-150			
Matrix Spike (BJJ0428-MS1)		Source: 21J0060-01	Prepared: 15-Oct-2021 Analyzed: 23-Oct-2021 10:02							
Diesel Range Organics (C12-C24)	591	5.62	mg/kg	169	351	142	63-120			*, E
<i>Surrogate: o-Terphenyl</i>	10.8		mg/kg	12.7	6.76	85.4	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BJJ0428-MSD1)		Source: 21J0060-01	Prepared: 15-Oct-2021 Analyzed: 23-Oct-2021 10:22							
Diesel Range Organics (C12-C24)	646	5.62	mg/kg	169	351	175	63-120	8.91	30	*, E
<i>Surrogate: o-Terphenyl</i>	10.7		mg/kg	12.7	6.76	84.6	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJJ0429 - EPA 3546 (Microwave)

Instrument: FID4 Analyst: CTO

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0429-BLK1)		Prepared: 15-Oct-2021 Analyzed: 25-Oct-2021 21:56								
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
<i>Surrogate: o-Terphenyl</i>	10.1		mg/kg	11.3		90.0	50-150			
LCS (BJJ0429-BS1)		Prepared: 15-Oct-2021 Analyzed: 25-Oct-2021 22:16								
Diesel Range Organics (C12-C24)	151	5.00	mg/kg	150		101	63-120			
<i>Surrogate: o-Terphenyl</i>	10.7		mg/kg	11.3		95.2	50-150			
LCS Dup (BJJ0429-BSD1)		Prepared: 15-Oct-2021 Analyzed: 25-Oct-2021 22:37								
Diesel Range Organics (C12-C24)	157	5.00	mg/kg	150		104	63-120	3.59	30	
<i>Surrogate: o-Terphenyl</i>	10.6		mg/kg	11.3		94.4	50-150			
Matrix Spike (BJJ0429-MS1)		Source: 21J0060-31	Prepared: 15-Oct-2021 Analyzed: 26-Oct-2021 04:18							
Diesel Range Organics (C12-C24)	191	6.64	mg/kg	199	6.76	92.5	63-120			
<i>Surrogate: o-Terphenyl</i>	12.3		mg/kg	14.9	13.8	82.3	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BJJ0429-MSD1)		Source: 21J0060-31	Prepared: 15-Oct-2021 Analyzed: 26-Oct-2021 04:38							
Diesel Range Organics (C12-C24)	186	6.64	mg/kg	199	6.76	90.1	63-120	2.55	30	
<i>Surrogate: o-Terphenyl</i>	11.8		mg/kg	14.9	13.8	78.9	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJJ0430 - EPA 3546 (Microwave)

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0430-BLK1)		Prepared: 15-Oct-2021 Analyzed: 04-Nov-2021 07:05								
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
<i>Surrogate: o-Terphenyl</i>	10.5		mg/kg	11.3		93.7	50-150			
LCS (BJJ0430-BS1)		Prepared: 15-Oct-2021 Analyzed: 04-Nov-2021 07:25								
Diesel Range Organics (C12-C24)	138	5.00	mg/kg	150		91.9	63-120			
<i>Surrogate: o-Terphenyl</i>	9.33		mg/kg	11.3		82.9	50-150			
LCS Dup (BJJ0430-BSD1)		Prepared: 15-Oct-2021 Analyzed: 04-Nov-2021 07:45								
Diesel Range Organics (C12-C24)	149	5.00	mg/kg	150		99.3	63-120	7.78	30	
<i>Surrogate: o-Terphenyl</i>	10.8		mg/kg	11.3		96.3	50-150			
Matrix Spike (BJJ0430-MS1)		Source: 21J0060-44	Prepared: 15-Oct-2021 Analyzed: 04-Nov-2021 09:26							
Diesel Range Organics (C12-C24)	3100	118	mg/kg	178	3470	-208	63-120			*, D
<i>Surrogate: o-Terphenyl</i>	9.71		mg/kg	13.3	9.93	72.9	50-150			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BJJ0430-MSD1)		Source: 21J0060-44	Prepared: 15-Oct-2021 Analyzed: 04-Nov-2021 09:46							
Diesel Range Organics (C12-C24)	3800	118	mg/kg	178	3470	182	63-120	20.10	30	*, D
<i>Surrogate: o-Terphenyl</i>	9.71		mg/kg	13.3	9.93	72.9	50-150			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										


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 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJJ0448 - EPA 3550C (Ultrasonic)

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0448-BLK1)		Prepared: 18-Oct-2021 Analyzed: 09-Nov-2021 18:13								
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
<i>Surrogate: o-Terphenyl</i>	10.2		mg/kg	11.3		90.7	50-150			
LCS (BJJ0448-BS1)		Prepared: 18-Oct-2021 Analyzed: 09-Nov-2021 18:33								
Diesel Range Organics (C12-C24)	147	5.00	mg/kg	150		98.1	63-120			
<i>Surrogate: o-Terphenyl</i>	9.95		mg/kg	11.3		88.4	50-150			
Matrix Spike (BJJ0448-MS1)		Source: 21J0060-09	Prepared: 18-Oct-2021 Analyzed: 09-Nov-2021 19:13							
Diesel Range Organics (C12-C24)	186	5.19	mg/kg	156	38.9	94.6	63-120			
<i>Surrogate: o-Terphenyl</i>	9.50		mg/kg	11.7	9.17	81.3	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
Matrix Spike Dup (BJJ0448-MSD1)		Source: 21J0060-09	Prepared: 18-Oct-2021 Analyzed: 09-Nov-2021 19:33							
Diesel Range Organics (C12-C24)	194	5.19	mg/kg	156	38.9	99.4	63-120	3.96	30	
<i>Surrogate: o-Terphenyl</i>	9.50		mg/kg	11.7	9.17	81.3	50-150			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Aroclor PCB - Quality Control
Batch BJJ0434 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0434-BLK1)											
						Prepared: 15-Oct-2021 Analyzed: 13-Nov-2021 19:03					
Aroclor 1016	ND	1.6	4.0	ug/kg							U
Aroclor 1221	ND	1.6	4.0	ug/kg							U
Aroclor 1232	ND	1.6	4.0	ug/kg							U
Aroclor 1242	ND	1.6	4.0	ug/kg							U
Aroclor 1248	ND	1.6	4.0	ug/kg							U
Aroclor 1254	ND	1.6	4.0	ug/kg							U
Aroclor 1260	ND	0.6	4.0	ug/kg							U
Aroclor 1262	ND	0.6	4.0	ug/kg							U
Aroclor 1268	ND	0.6	4.0	ug/kg							U
Surrogate: Decachlorobiphenyl	7.63			ug/kg	8.00		95.4	40-126			
Surrogate: Tetrachlorometaxylene	6.47			ug/kg	8.00		80.9	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.70			ug/kg	8.00		96.3	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.17			ug/kg	8.00		77.2	44-120			
LCS (BJJ0434-BS1)											
						Prepared: 15-Oct-2021 Analyzed: 13-Nov-2021 19:24					
Aroclor 1016 [2C]	82.7	1.6	4.0	ug/kg	101		82.0	56-120			
Aroclor 1260	81.5	0.6	4.0	ug/kg	101		80.9	58-120			
Surrogate: Decachlorobiphenyl	7.94			ug/kg	8.00		99.3	40-126			
Surrogate: Tetrachlorometaxylene	6.60			ug/kg	8.00		82.5	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.98			ug/kg	8.00		99.8	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.26			ug/kg	8.00		78.2	44-120			
LCS Dup (BJJ0434-BSD1)											
						Prepared: 15-Oct-2021 Analyzed: 13-Nov-2021 19:45					
Aroclor 1016 [2C]	81.7	1.6	4.0	ug/kg	101		81.1	56-120	1.15	30	
Aroclor 1260	79.9	0.6	4.0	ug/kg	101		79.2	58-120	2.10	30	
Surrogate: Decachlorobiphenyl	7.25			ug/kg	8.00		90.6	40-126			
Surrogate: Tetrachlorometaxylene	6.13			ug/kg	8.00		76.6	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.37			ug/kg	8.00		92.1	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.78			ug/kg	8.00		72.2	44-120			



Analytical Report

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400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJJ0466 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0466-BLK1)											
						Prepared: 18-Oct-2021 Analyzed: 17-Nov-2021 03:50					
Aroclor 1016	ND	1.6	4.0	ug/kg							U
Aroclor 1221	ND	1.6	4.0	ug/kg							U
Aroclor 1232	ND	1.6	4.0	ug/kg							U
Aroclor 1242	ND	1.6	4.0	ug/kg							U
Aroclor 1248	ND	1.6	4.0	ug/kg							U
Aroclor 1254	ND	1.6	4.0	ug/kg							U
Aroclor 1260	ND	0.6	4.0	ug/kg							U
Aroclor 1262	ND	0.6	4.0	ug/kg							U
Aroclor 1268	ND	0.6	4.0	ug/kg							U
Surrogate: Decachlorobiphenyl	8.57			ug/kg	8.00		107	40-126			
Surrogate: Tetrachlorometaxylene	7.21			ug/kg	8.00		90.1	44-120			
Surrogate: Decachlorobiphenyl [2C]	8.66			ug/kg	8.00		108	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.70			ug/kg	8.00		83.7	44-120			
LCS (BJJ0466-BS1)											
						Prepared: 18-Oct-2021 Analyzed: 17-Nov-2021 04:12					
Aroclor 1016 [2C]	84.8	1.6	4.0	ug/kg	101		84.1	56-120			
Aroclor 1260	81.6	0.6	4.0	ug/kg	101		80.9	58-120			
Surrogate: Decachlorobiphenyl	7.57			ug/kg	8.00		94.6	40-126			
Surrogate: Tetrachlorometaxylene	6.37			ug/kg	8.00		79.6	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.62			ug/kg	8.00		95.3	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.05			ug/kg	8.00		75.7	44-120			
LCS Dup (BJJ0466-BSD1)											
						Prepared: 18-Oct-2021 Analyzed: 17-Nov-2021 04:33					
Aroclor 1016 [2C]	88.6	1.6	4.0	ug/kg	101		87.9	56-120	4.33	30	
Aroclor 1260	85.1	0.6	4.0	ug/kg	101		84.4	58-120	4.16	30	
Surrogate: Decachlorobiphenyl	7.76			ug/kg	8.00		96.9	40-126			
Surrogate: Tetrachlorometaxylene	6.61			ug/kg	8.00		82.6	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.93			ug/kg	8.00		99.1	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.42			ug/kg	8.00		80.3	44-120			
Matrix Spike (BJJ0466-MS1)											
			Source: 21J0060-15			Prepared: 18-Oct-2021 Analyzed: 17-Nov-2021 05:16					
Aroclor 1016	81.7	7.8	19.9	ug/kg	100	ND	81.3	56-120			D
Aroclor 1260	203	2.9	19.9	ug/kg	100	120	83.0	58-120			D
Surrogate: Decachlorobiphenyl	10.5			ug/kg	7.97		131	40-126			*


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Aroclor PCB - Quality Control
Batch BJJ0466 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJJ0466-MS1)		Source: 21J0060-15		Prepared: 18-Oct-2021		Analyzed: 17-Nov-2021 05:16					
Surrogate: Tetrachlorometaxylene	5.70			ug/kg	7.97		71.4	44-120			
Surrogate: Decachlorobiphenyl [2C]	9.12			ug/kg	7.97		114	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.90			ug/kg	7.97		74.0	44-120			

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

Matrix Spike Dup (BJJ0466-MSD1)		Source: 21J0060-15		Prepared: 18-Oct-2021		Analyzed: 17-Nov-2021 05:38					
Aroclor 1016	85.9	7.8	19.9	ug/kg	100	ND	85.5	56-120	5.01	30	D
Aroclor 1260	222	2.9	19.9	ug/kg	100	120	102	58-120	8.58	30	D
Surrogate: Decachlorobiphenyl	10.4			ug/kg	7.97		130	40-126			*
Surrogate: Tetrachlorometaxylene	6.35			ug/kg	7.97		79.6	44-120			
Surrogate: Decachlorobiphenyl [2C]	9.13			ug/kg	7.97		115	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.37			ug/kg	7.97		79.9	44-120			

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



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJJ0467 - EPA 3550C (Ultrasonic)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0467-BLK1)											
						Prepared: 18-Oct-2021 Analyzed: 11-Nov-2021 15:06					
Aroclor 1016	ND	1.6	4.0	ug/kg							U
Aroclor 1221	ND	1.6	4.0	ug/kg							U
Aroclor 1232	ND	1.6	4.0	ug/kg							U
Aroclor 1242	ND	1.6	4.0	ug/kg							U
Aroclor 1248	ND	1.6	4.0	ug/kg							U
Aroclor 1254	ND	1.6	4.0	ug/kg							U
Aroclor 1260	ND	0.6	4.0	ug/kg							U
Aroclor 1262	ND	0.6	4.0	ug/kg							U
Aroclor 1268	ND	0.6	4.0	ug/kg							U
Surrogate: Decachlorobiphenyl	7.00			ug/kg	8.00		87.5	40-126			
Surrogate: Tetrachlorometaxylene	5.70			ug/kg	8.00		71.3	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.34			ug/kg	8.00		79.3	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.60			ug/kg	8.00		70.0	44-120			
LCS (BJJ0467-BS1)											
						Prepared: 18-Oct-2021 Analyzed: 11-Nov-2021 15:27					
Aroclor 1016 [2C]	83.3	1.6	4.0	ug/kg	101		82.7	56-120			
Aroclor 1260	85.6	0.6	4.0	ug/kg	101		84.9	58-120			
Surrogate: Decachlorobiphenyl	7.43			ug/kg	8.00		92.9	40-126			
Surrogate: Tetrachlorometaxylene	6.14			ug/kg	8.00		76.7	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.63			ug/kg	8.00		82.9	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.82			ug/kg	8.00		72.7	44-120			
LCS Dup (BJJ0467-BSD1)											
						Prepared: 18-Oct-2021 Analyzed: 11-Nov-2021 15:48					
Aroclor 1016 [2C]	77.3	1.6	4.0	ug/kg	101		76.7	56-120	7.53	30	
Aroclor 1260	80.4	0.6	4.0	ug/kg	101		79.8	58-120	6.19	30	
Surrogate: Decachlorobiphenyl	7.04			ug/kg	8.00		88.1	40-126			
Surrogate: Tetrachlorometaxylene	5.62			ug/kg	8.00		70.2	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.38			ug/kg	8.00		79.7	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.36			ug/kg	8.00		67.0	44-120			
Matrix Spike (BJJ0467-MS1)											
			Source: 21J0060-34			Prepared: 18-Oct-2021 Analyzed: 11-Nov-2021 17:36					
Aroclor 1016	81.3	1.7	4.5	ug/kg	113	ND	72.0	56-120			
Aroclor 1260	90.1	0.7	4.5	ug/kg	113	ND	79.7	58-120			
Surrogate: Decachlorobiphenyl	7.57			ug/kg	8.96		84.4	40-126			


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Aroclor PCB - Quality Control
Batch BJJ0467 - EPA 3550C (Ultrasonic)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJJ0467-MS1)		Source: 21J0060-34		Prepared: 18-Oct-2021		Analyzed: 11-Nov-2021 17:36					
Surrogate: Tetrachlorometaxylene	6.32			ug/kg	8.96		70.5	44-120			
Surrogate: Decachlorobiphenyl [2C]	6.87			ug/kg	8.96		76.6	40-126			
Surrogate: Tetrachlorometaxylene [2C]	5.96			ug/kg	8.96		66.5	44-120			

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

Matrix Spike Dup (BJJ0467-MSD1)		Source: 21J0060-34		Prepared: 18-Oct-2021		Analyzed: 11-Nov-2021 17:57					
Aroclor 1016	90.5	1.7	4.5	ug/kg	113	ND	80.2	56-120	10.80	30	
Aroclor 1260	100	0.7	4.5	ug/kg	113	ND	88.5	58-120	10.90	30	
Surrogate: Decachlorobiphenyl	8.35			ug/kg	8.96		93.1	40-126			
Surrogate: Tetrachlorometaxylene	6.91			ug/kg	8.96		77.1	44-120			
Surrogate: Decachlorobiphenyl [2C]	7.66			ug/kg	8.96		85.4	40-126			
Surrogate: Tetrachlorometaxylene [2C]	6.53			ug/kg	8.96		72.8	44-120			

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



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJJ0471 - EPA 3580A (Vortex)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJJ0471-BLK1)						Prepared: 18-Oct-2021 Analyzed: 10-Nov-2021 15:27					
Aroclor 1016	ND	38	800	ug/kg							U
Aroclor 1221	ND	38	800	ug/kg							U
Aroclor 1232	ND	38	800	ug/kg							U
Aroclor 1242	ND	38	800	ug/kg							U
Aroclor 1248	ND	38	800	ug/kg							U
Aroclor 1254	ND	38	800	ug/kg							U
Aroclor 1260	ND	73	800	ug/kg							U
Aroclor 1262	ND	73	800	ug/kg							U
Aroclor 1268	ND	73	800	ug/kg							U
Surrogate: Decachlorobiphenyl	1510			ug/kg	1600		94.4	67-145			
Surrogate: Tetrachlorometaxylene	1340			ug/kg	1600		83.8	69-120			
Surrogate: Decachlorobiphenyl [2C]	1380			ug/kg	1600		86.6	67-145			
Surrogate: Tetrachlorometaxylene [2C]	1360			ug/kg	1600		84.9	69-120			
LCS (BJJ0471-BS1)						Prepared: 18-Oct-2021 Analyzed: 10-Nov-2021 15:47					
Aroclor 1016 [2C]	18300	38	800	ug/kg	20000		91.3	51-120			
Aroclor 1260	17200	73	800	ug/kg	20000		86.2	59-120			
Surrogate: Decachlorobiphenyl	1490			ug/kg	1600		93.1	67-145			
Surrogate: Tetrachlorometaxylene	1340			ug/kg	1600		84.0	69-120			
Surrogate: Decachlorobiphenyl [2C]	1380			ug/kg	1600		86.5	67-145			
Surrogate: Tetrachlorometaxylene [2C]	1300			ug/kg	1600		81.5	69-120			
Matrix Spike (BJJ0471-MS1)						Source: 21J0060-10 Prepared: 18-Oct-2021 Analyzed: 10-Nov-2021 16:28					
Aroclor 1016	22600	509	10700	ug/kg	26700	ND	84.7	59-120			P1, D
Aroclor 1260	329000	975	10700	ug/kg	26700	447000	-441.9	59-120			*, D
Surrogate: Decachlorobiphenyl	2580			ug/kg	2130		121	67-145			
Surrogate: Tetrachlorometaxylene	1940			ug/kg	2130		91.1	69-120			
Surrogate: Decachlorobiphenyl [2C]	2230			ug/kg	2130		105	67-145			
Surrogate: Tetrachlorometaxylene [2C]	2220			ug/kg	2130		104	69-120			

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

Matrix Spike Dup (BJJ0471-MSD1)						Source: 21J0060-10 Prepared: 18-Oct-2021 Analyzed: 10-Nov-2021 16:49					
Aroclor 1016	24100	509	10700	ug/kg	26700	ND	90.2	59-120	6.32	30	P1, D
Aroclor 1260	405000	975	10700	ug/kg	26700	447000	-157.3	59-120	20.90	30	*, D, E


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Project: Lower Duwamish Soils 2021

Project Number: 21-1-12596

Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Analysis by: Analytical Resources, LLC
Aroclor PCB - Quality Control
Batch BJJ0471 - EPA 3580A (Vortex)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJJ0471-MSD1)		Source: 21J0060-10		Prepared: 18-Oct-2021		Analyzed: 10-Nov-2021 16:49					
Surrogate: Decachlorobiphenyl	2740			ug/kg	2130	129		67-145			
Surrogate: Tetrachlorometaxylene	2190			ug/kg	2130	103		69-120			
Surrogate: Decachlorobiphenyl [2C]	2390			ug/kg	2130	112		67-145			
Surrogate: Tetrachlorometaxylene [2C]	2420			ug/kg	2130	113		69-120			

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


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 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 19-Nov-2021 16:59

Certified Analyses included in this Report

Analyte	Certifications
EPA 8082A in Solid	
Aroclor 1016	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1016 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1221	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1221 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1232	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1232 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1242	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1242 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1248	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1248 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1254	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1254 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1260	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1260 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1262	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1262 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1268	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1268 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1016	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1016 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1221	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1221 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1232	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1232 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1242	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1242 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1248	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1248 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1254	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1254 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1260	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1260 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1262	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1262 [2C]	WADOE, DoD-ELAP, NELAP, ADEC
Aroclor 1268	WADOE, DoD-ELAP, NELAP, ADEC


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021

Project Number: 21-1-12596

Project Manager: Meg Strong

Reported:

19-Nov-2021 16:59

Aroclor 1268 [2C]

WADOE, DoD-ELAP, NELAP, ADEC

NWTPH-Dx in Solid

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP, NELAP, WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP, NELAP, WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Project: Lower Duwamish Soils 2021
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19-Nov-2021 16:59

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

17 March 2022

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Soils 2021 (21-1-12596)

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.

Associated Work Order(s)
21L0122

Associated SDG ID(s)
N/A

Digitally signed by Shelly
Shelly Fishel Fishel
Date: 2022.03.17 09:15:09
-07'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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.



21L0122

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>210060</u>		Turn-around Requested: <u>Standard</u>		Page: <u>1</u> of <u>6</u>									
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>10/4</u>	Ice Present?								
Client Contact: <u>Shoshanna Howard</u>		No. of Coolers: <u>2</u>		Cooler Temps: <u>see CRF</u>									
Client Project Name: <u>LPW</u>		Analysis Requested				Notes/Comments							
Client Project #: <u>21-1-12596</u>	Samplers: <u>5XS / RMV</u>												
Sample ID	Date	Time	Matrix	No. Containers	TPH-DX	P.C.B. Analysis							
SB-2021-048: 1.5-10042021	10/4	0905	Soil	1	X	X							
" " : 2.2-10042021	↓	0915	↓	↓	↓	↓							
" " : 6-10042021	↓	0920	↓	↓	↓	↓							
" " : 8.5-10042021	↓	0920	↓	↓	↓	↓							
SB-2021- ⁰⁴⁹ 048 : 1-10042021	10/4	0930	Soil	1	X	X							
" " -049: 2.2- "	↓	0932	↓	↓	↓	↓							
" " " : 6.5- "	↓	0935	↓	↓	↓	↓							
" " " : 7.5- "	↓	0940	↓	↓	↓	↓							
SB-2021-050: 0.5-10042021	10/4	0950	Soil	1	X	X							
SB- " - " : 2.5 "	"	0950	↓	↓	↓	↓							
Comments/Special Instructions	Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>		Relinquished by: (Signature)		Received by: (Signature)						
	Printed Name: <u>Joseph Swoboda</u>		Printed Name: <u>Raven Barbera</u>		Printed Name:		Printed Name:						
	Company: <u>Shannon & Wilson</u>		Company: <u>ARI</u>		Company:		Company:						
	Date & Time: <u>10/4 14:57</u>		Date & Time: <u>10/4/21 1457</u>		Date & Time:		Date & Time:						



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
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 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

21L0122

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>2130060</u>		Turn-around Requested: <u>Standard</u>		Page: <u>2</u> of <u>6</u>	
ARI Client Company: <u>Shannon + Wilson</u>		Phone:		Date: <u>10/14</u>	Ice Present?
Client Contact: <u>Shoshana Howard</u>				No. of Coolers: <u>2</u>	Cooler Temps:
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12596</u>					
Samplers: <u>JXS/Rmv</u>		Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-050:6.5-10042021	10/14	1000	Soil	1	X X
" " " : 7.5 "	10/14	1000	Soil	1	X X
SB-2021-051:1.2-10042021	10/14	1010	Soil	1	X X
" " " : 2.4 "		1015			
" " " : 6.5 "		1020			
" " " : 8.0 "		1020			
" " " : 10.5 "		1025			
" " " : 12.5 "		1030			
SB-2021-052:0.1-10042021	10/14	1040	Soil	1	X X
SB-2021-052:2.4-11		1040	Soil	1	X X
Comments/Special Instructions		Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>	
		Printed Name: <u>Joe Sander</u>		Printed Name: <u>Raven Barbera</u>	
		Company: <u>Shn & Wil</u>		Company: <u>ARI</u>	
		Date & Time: <u>10/14 14:57</u>		Date & Time: <u>10/14/21 1457</u>	



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Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

ARI Assigned Number:	Turn-around Requested:
----------------------	------------------------

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
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21L0122

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>2150060</u>		Turn-around Requested: <u>Standard</u>		Page: <u>4</u> of <u>6</u>		 Analytical Resources, Incorporated Analytical Chemists and Consultants 4611 South 134th Place, Suite 100 Tukwila, WA 98168 206-695-6200 206-695-6201 (fax) www.arilabs.com					
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>10/4</u>				Ice Present?			
Client Contact: <u>Shoshana Howard</u>				No. of Coolers:				Cooler Temps:			
Client Project Name: <u>LDW</u>											
Client Project #: <u>21-1-12596</u>		Samplers: <u>SXS / RMV</u>		Analysis Requested						Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	TPH-PX	PCB Aroclors					
SB-2021-053: 1.0-10042021	10/4	1055	Soil	1	X	X					H = Hold
" " : 2.8-10042021		1055			X	X					
" " : 6.0-10042021		1100			H	H					
" " : 8.8-10042021		1100			H	H					
" " : 11.0-10042021		1110			X	X					
" " : 13.0-10042021		1110			X	X					
SB-2021-054: 0.5-10042021	10/4	1125	Soil	1	X	X					
" " : 2.5-10042021		1125			X	X					
" " : 5.9-10042021		1130			X	X					
" " : 7.0-10042021		1130			X	X					
Comments/Special Instructions	Relinquished by: (Signature) <u>[Signature]</u>		Received by: (Signature) <u>[Signature]</u>		Relinquished by: (Signature)		Received by: (Signature)				
	Printed Name: <u>Joe Smiley</u>		Printed Name: <u>Raven Barbera</u>		Printed Name:		Printed Name:				
	Company: <u>Shannon & Wilson</u>		Company: <u>ARI</u>		Company:		Company:				
	Date & Time: <u>10/4 14:57</u>		Date & Time: <u>10/4/21 1457</u>		Date & Time:		Date & Time:				

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21L0122

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <u>2130060</u>		Turn-around Requested: <u>Standard</u>		Page: <u>5</u> of <u>6</u>	
ARI Client Company: <u>Shannon & Wilson</u>		Phone:		Date: <u>10/4</u>	Ice Present?
Client Contact: <u>Shoshanna Howard</u>				No. of Coolers:	Cooler Temps:
Client Project Name: <u>LDW</u>		Analysis Requested			
Client Project #: <u>21-1-12596</u>					
Samplers: <u>IXS / RMV</u>		Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	
SB-2021-055; 0.5-10042021	10/4	1145	Soil	1	H = Hold
" : 2.2-10042021		1145			
" : 5.5-10042021		1150			
" : 7.5-10042021		1150			
SB-2021-056; 1.0-10042021	10/4	1200	Soil	1	
" : 2.5-10042021		1200			
" : 5.5-10042021		1205			
" : 7.7-10042021		1205			
" : 10.0-10042021		1215			
" : 11.5-10042021		1215			
Comments/Special Instructions	Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Relinquished by: (Signature)		Received by: (Signature)
	Printed Name: <u>Joe Sawley</u>	Printed Name: <u>Raven Barbera</u>	Printed Name:		Printed Name:
	Company: <u>Shannon & Wilson</u>	Company: <u>ARI</u>	Company:		Company:
	Date & Time: <u>10/4 14:57</u>	Date & Time: <u>10/4/21 1457</u>	Date & Time:		Date & Time:



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21L0122

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 210000		Turn-around Requested: Standard		Page: 6 of 6																																																		
ARI Client Company: Shannon & Wilson		Phone:		Date: 10/4	Ice Present?																																																	
Client Contact: Shoshana Howard		No. of Coolers:		Cooler Temps:																																																		
Client Project Name: LDW		<table border="1"> <thead> <tr> <th colspan="6">Analysis Requested</th> <th>Notes/Comments</th> </tr> </thead> <tbody> <tr> <td rowspan="8">NUM-Dx</td> <td rowspan="8">PCB Analysis</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>				Analysis Requested						Notes/Comments	NUM-Dx	PCB Analysis																																								
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Client Project #: 21-1-12596	Samplers: JXS / RMV																																																					

Sample ID	Date	Time	Matrix	No. Containers	NUM-Dx	PCB Analysis									
SB-2021-057: 0.8-10042021	10/4	1230	Soil	1	X	X									
11 11 : 2.4-10042021		1230			X	X									
11 11 : 5.5-10042021		1245			X	X									
11 11 : 7.5-10042021		1245			X	X									
11 11 : 10.0-10042021		1300			H	H									
11 11 : 11.5-10042021		1300			H	H									
SB-2021 *DUP		—			X	X									
Drum-Camp-10042021		1425			X	X									

Comments/Special Instructions	Relinquished by: (Signature) [Signature]	Received by: (Signature) [Signature]	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Joe Sandberg	Printed Name: Raven Barbera	Printed Name:	Printed Name:
	Company: Shan & Wil	Company: ARI	Company:	Company:
	Date & Time: 10/4 14:57	Date & Time: 10/4/21 1457	Date & Time:	Date & Time:



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Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021

Project Number: 21-1-12596

Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Drum-Comp-10042021	21L0122-01	Solid	04-Oct-2021 14:25	08-Dec-2021 15:50



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Soils 2021
Work Order: 21L0122

Revised Report - March 17, 2022

This report was revised to include TCLP followups.

Sample receipt

One sample as listed on the preceding page was received 08-Dec-2021 15:50 under ARI work order 21L0122. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times for frozen samples.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) and the matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits except as flagged.

Total Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times for frozen samples.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) and the matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits except as flagged.

TCLP Metals

The sample(s) were digested and analyzed outside the recommended holding times. TCLP follow up was requested after



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

hold time had expired. Client approved out of hold analysis.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: LDW

COC No(s): _____ (NA)

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

Assigned ARI Job No: 21J0060

Tracking No: _____ (NA)

Preliminary Examination Phase: 21L0122

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES (NO)

Were custody papers included with the cooler? YES (YES) NO

Were custody papers properly filled out (ink, signed, etc.) YES (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1555 1457

6.0 2.7

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO2565

Cooler Accepted by: RB Date: 10/4/21 Time: 1457

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

How were bottles sealed in plastic bags? (Individually) (Grouped) Not

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)

Were the sample(s) split by ARI? (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JS Date: 10/5/21 Time: 1428 Labels checked by: JS

RB ** Notify Project Manager of discrepancies or concerns **
12/8/21 1550

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

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

Follow-up analysis: 21J0060

Shoshana Howard <Shoshana.Howard@shanwil.com>

Wed 12/8/2021 1:19 PM

To: Shelly Fishel <shelly.fishel@arilabs.com>

Cc: Meg Strong <Meg.Strong@shanwil.com>

Hi Shelly,

Do you still have soil remaining from sample Drum-Comp-10042021 from work order 21J0060? The final report was issued on November 19, 2021.

If you do have remaining soil available, can you run RCRA 8 metals + Cu, Ni, Zn?

If you don't, let me know and we'll have to grab a sample to submit.

Thanks!

Shoshana Howard, PE

SENIOR ENGINEER

SHANNON & WILSON

400 N 34th Street, Suite 100

Seattle, WA 98103

shannonwilson.com

Phone: **(206) 632-8020**

Direct: **(206) 695-6811**

Mobile: **(206) 900-2720**

Shoshana.Howard@shanwil.com

Please note, my email address has been updated. You can still reach me at the old address.

RE: Follow-up TCLP

Shoshana Howard <Shoshana.Howard@shanwil.com>

Mon 3/14/2022 8:53 AM

To: Shelly Fishel <shelly.fishel@arilabs.com>

Hi Shelly,

Yes, please run.

Thanks!

Shoshana Howard, PE

SENIOR ENGINEER

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Seattle, WA 98103

shannonwilson.com

Phone: **(206) 632-8020**

Direct: **(206) 695-6811**

Mobile: **(206) 900-2720**

Shoshana.Howard@shanwil.com

Please note, my email address has been updated. You can still reach me at the old address.

From: Shelly Fishel <shelly.fishel@arilabs.com>

Sent: Friday, March 11, 2022 2:50 PM

To: Shoshana Howard <Shoshana.Howard@shanwil.com>

Subject: Re: Follow-up TCLP

Oh, Sorry I should have also mentioned that this sample is out of hold for TCLP. Please confirm you want it run out of hold.

Be safe and stay healthy!

****Please email your bottle requests to your project manager several days before needed to give staff time to assemble the kit - we may not be able to accommodate your request as a walk-in****

Regards,

Shelly L Fishel, Project Manager

She/Her/Hers

Analytical Resources, LLC

Analytical Chemists and Consultants

4611 South 134th Place, Suite 100

Tukwila, WA 98168

(206) 695-6210 office

(210) 845-0183 cell

Email: [mailto:shelly.fishel@arilabs.com]shelly.fishel@arilabs.com

Please note that sample receiving hours will be changed to 8-5 until further notice. *Courier and bottle kit requests can not be guaranteed for same day pick-ups or deliveries. Please schedule in advance.*

From: Shelly Fishel <shelly.fishel@arilabs.com>

Sent: Friday, March 11, 2022 12:38 PM

To: Shoshana Howard <Shoshana.Howard@shanwil.com>

Subject: Re: Follow-up TCLP

Hi Shoshana,

The analysis has been added. Hope to have data by the 18th.

Be safe and stay healthy!

****Please email your bottle requests to your project manager several days before needed to give staff time to assemble the kit - we may not be able to accommodate your request as a walk-in****

Regards,

Shelly L Fishel, *Project Manager*

She/Her/Hers

Analytical Resources, LLC

Analytical Chemists and Consultants

4611 South 134th Place, Suite 100

Tukwila, WA 98168

(206) 695-6210 office

(210) 845-0183 cell

Email: [mailto:shelly.fishel@arilabs..com]shelly.fishel@arilabs.com

Please note that sample receiving hours will be changed to 8-5 until further notice. *Courier and bottle kit requests can not be guaranteed for same day pick-ups or deliveries. Please schedule in advance.*

From: Shoshana Howard <Shoshana.Howard@shanwil.com>

Sent: Friday, March 11, 2022 12:01 PM

To: Shelly Fishel <shelly.fishel@arilabs.com>

Subject: Follow-up TCLP

Hi Shelly,

Do you still have sample left from Drum-Comp-10042021 (Work Order 21L0122)? If yes, we would like to run TCLP for Chromium.

Thanks!

Shoshana Howard, PE

SENIOR ENGINEER

SHANNON & WILSON

400 N 34th Street, Suite 100

Seattle, WA 98103

shannonwilson.com

Phone: **(206) 632-8020**

Direct: **(206) 695-6811**

Mobile: **(206) 900-2720**

Shoshana.Howard@shanwil.com

Please note, my email address has been updated. You can still reach me at the old address.

How was your customer experience?

Please take our 5 minute [Online Customer Survey](#)

Analytical Resources, LLC

Analytical Chemists and Consultants

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Analytical Resources, LLC


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 17-Mar-2022 09:08

Drum-Comp-10042021
21L0122-01 (Solid)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 10/04/2021 14:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/13/2021 17:52

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21L0122-01 A 01

Preparation Batch: BJL0268

Sample Size: 1.012 g (wet)

Dry Weight: 0.86 g

Prepared: 12/13/2021

Final Volume: 50 mL

% Solids: 85.08

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	20	0.13	0.58	51.8	mg/kg	
Chromium	7440-47-3	20	0.30	0.58	103	mg/kg	
Lead	7439-92-1	20	0.06	0.12	32.2	mg/kg	
Silver	7440-22-4	20	0.03	0.23	0.31	mg/kg	


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 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 17-Mar-2022 09:08

Drum-Comp-10042021
21L0122-01 (Solid)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 10/04/2021 14:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/13/2021 17:52

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: SWN EPA 3050B

Extract ID: 21L0122-01 A 01

Preparation Batch: BJL0268

Sample Size: 1.012 g (wet)

Dry Weight: 0.86 g

Prepared: 12/13/2021

Final Volume: 50 mL

% Solids: 85.08

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	20	0.04	0.23	11.9	mg/kg	
Cadmium	7440-43-9	20	0.03	0.12	1.74	mg/kg	
Copper	7440-50-8	20	0.20	0.58	183	mg/kg	
Selenium	7782-49-2	20	0.21	0.58	1.03	mg/kg	
Zinc	7440-66-6	20	1.1	7.0	182	mg/kg	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

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Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Drum-Comp-10042021
21L0122-01 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B

Sampled: 10/04/2021 14:25

Instrument: HYDRA Analyst: ML

Analyzed: 12/17/2021 11:57

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: SMM EPA 7471B

Extract ID: 21L0122-01 A

Preparation Batch: B JL0417

Sample Size: 0.218 g (wet)

Dry Weight: 0.19 g

Prepared: 12/16/2021

Final Volume: 50 mL

% Solids: 85.08

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00566	0.0270	0.0292	mg/kg	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Drum-Comp-10042021
21L0122-01 (Solid)

TCLP Metals and Metallic Compounds

Method: EPA 6010D

Sampled: 10/04/2021 14:25

Instrument: ICP2 Analyst: MVP

Analyzed: 03/15/2022 17:34

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: LEN Digestion of EPA 1311 Elutriate

Extract ID: 21L0122-01 A 03

Preparation Batch: BKC0342

Sample Size: 25 mL (wet)

Prepared: 03/15/2022

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	5	0.0024	0.0250	0.0141	mg/L	J



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Drum-Comp-10042021
21L0122-01RE1 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 10/04/2021 14:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/13/2021 19:09

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: SWN EPA 3050B	Extract ID: 21L0122-01RE1 A 01
	Preparation Batch: BJL0268	Dry Weight: 0.86 g
	Prepared: 12/13/2021	% Solids: 85.08
	Sample Size: 1.012 g (wet)	
	Final Volume: 50 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Nickel	7440-02-0	100	0.46	2.90	691	mg/kg	D


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 17-Mar-2022 09:08

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJL0268 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJL0268-BLK1)						Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 17:40						
Barium	135	ND	0.11	0.50	mg/kg							U
Barium	137	ND	0.08	0.50	mg/kg							U
Chromium	52	ND	0.26	0.50	mg/kg							U
Chromium	53	ND	0.24	0.50	mg/kg							U
Lead	208	ND	0.05	0.10	mg/kg							U
Silver	107	ND	0.02	0.20	mg/kg							U
Arsenic	75a	ND	0.04	0.20	mg/kg							U
Cadmium	111	ND	0.03	0.10	mg/kg							U
Cadmium	114	ND	0.04	0.10	mg/kg							U
Copper	63	ND	0.17	0.50	mg/kg							U
Copper	65	ND	0.35	0.50	mg/kg							U
Nickel	60	ND	0.08	0.50	mg/kg							U
Nickel	62	ND	0.22	0.50	mg/kg							U
Selenium	78	ND	0.18	0.50	mg/kg							U
Zinc	66	ND	2.9	6.0	mg/kg							U
Zinc	67	ND	0.9	6.0	mg/kg							U
LCS (BJL0268-BS1)						Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 17:45						
Barium	135	23.9	0.11	0.50	mg/kg	25.0		95.6	80-120			
Barium	137	23.7	0.08	0.50	mg/kg	25.0		95.0	80-120			
Chromium	52	24.5	0.26	0.50	mg/kg	25.0		98.1	80-120			
Chromium	53	24.2	0.24	0.50	mg/kg	25.0		96.9	80-120			
Lead	208	28.0	0.05	0.10	mg/kg	25.0		112	80-120			
Silver	107	25.7	0.02	0.20	mg/kg	25.0		103	80-120			
Arsenic	75a	23.8	0.04	0.20	mg/kg	25.0		95.1	80-120			
Cadmium	111	24.7	0.03	0.10	mg/kg	25.0		98.9	80-120			
Cadmium	114	24.3	0.04	0.10	mg/kg	25.0		97.3	80-120			
Copper	63	25.5	0.17	0.50	mg/kg	25.0		102	80-120			
Copper	65	25.7	0.35	0.50	mg/kg	25.0		103	80-120			
Nickel	60	24.9	0.08	0.50	mg/kg	25.0		99.7	80-120			
Nickel	62	25.0	0.22	0.50	mg/kg	25.0		100	80-120			
Selenium	78	73.0	0.18	0.50	mg/kg	80.0		91.3	80-120			
Zinc	66	78.7	2.9	6.0	mg/kg	80.0		98.4	80-120			
Zinc	67	71.5	0.9	6.0	mg/kg	80.0		89.4	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BJL0268 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BJL0268-DUP1)		Source: 21L0122-01				Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 17:59				
Barium	135	55.9	0.13	0.58	mg/kg		51.8			7.70	20	
Chromium	52	66.3	0.30	0.58	mg/kg		103			43.60	20	*
Lead	208	90.3	0.06	0.12	mg/kg		32.2			94.90	20	*
Silver	107	0.25	0.03	0.23	mg/kg		0.31			24.40	20	L
Arsenic	75a	9.15	0.04	0.23	mg/kg		11.9			26.30	20	*
Cadmium	111	3.32	0.03	0.12	mg/kg		1.74			62.60	20	*
Copper	63	131	0.20	0.58	mg/kg		183			33.00	20	*
Selenium	78	1.12	0.21	0.58	mg/kg		1.03			8.10	20	
Zinc	67	97.2	1.1	7.0	mg/kg		182			60.60	20	*

Duplicate (BJL0268-DUP2)		Source: 21L0122-01RE1				Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 19:14				
Nickel	60	319	0.47	2.91	mg/kg		691			73.60	20	*, D

Matrix Spike (BJL0268-MS1)		Source: 21L0122-01				Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 18:04				
Barium	135	86.0	0.13	0.58	mg/kg	29.1	51.8	117	75-125			
Chromium	52	125	0.30	0.58	mg/kg	29.1	103	75.8	75-125			
Lead	208	76.9	0.06	0.12	mg/kg	29.1	32.2	154	75-125			*
Silver	107	28.3	0.03	0.23	mg/kg	29.1	0.31	96.1	75-125			
Arsenic	75a	36.5	0.04	0.23	mg/kg	29.1	11.9	84.3	75-125			
Cadmium	111	33.1	0.03	0.12	mg/kg	29.1	1.74	108	75-125			
Copper	63	183	0.20	0.58	mg/kg	29.1	183	2.76	75-125			*
Selenium	78	81.2	0.21	0.58	mg/kg	93.2	1.03	86.1	75-125			
Zinc	67	202	1.1	7.0	mg/kg	93.2	182	21.6	75-125			*

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

Matrix Spike (BJL0268-MS2)		Source: 21L0122-01RE1				Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 19:19				
Nickel	60	372	0.47	2.91	mg/kg	29.1	691	-1090	75-125			HC, D

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

Matrix Spike Dup (BJL0268-MSD1)		Source: 21L0122-01				Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 18:09				
Barium	135	79.4	0.13	0.58	mg/kg	29.0	51.8	95.0	75-125	7.99	20	
Chromium	52	115	0.30	0.58	mg/kg	29.0	103	41.7	75-125	8.27	20	*
Lead	208	53.6	0.06	0.12	mg/kg	29.0	32.2	73.7	75-125	35.70	20	*
Silver	107	27.9	0.03	0.23	mg/kg	29.0	0.31	95.1	75-125	1.25	20	
Arsenic	75a	34.1	0.04	0.23	mg/kg	29.0	11.9	76.5	75-125	6.62	20	
Cadmium	111	30.0	0.03	0.12	mg/kg	29.0	1.74	97.2	75-125	9.88	20	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 17-Mar-2022 09:08

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJL0268 - SWN EPA 3050B

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJL0268-MSD1)		Source: 21L0122-01		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 18:09								
Copper	63	148	0.20	0.58	mg/kg	29.0	183	-120	75-125	21.60	20	*
Selenium	78	79.3	0.21	0.58	mg/kg	92.9	1.03	84.3	75-125	2.35	20	
Zinc	67	195	1.1	7.0	mg/kg	92.9	182	14.1	75-125	3.56	20	*

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

Matrix Spike Dup (BJL0268-MSD2)		Source: 21L0122-01RE1		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 19:24								
Nickel	60	324	0.46	2.90	mg/kg	29.0	691	-1260	75-125	13.80	20	HC, D

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


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 17-Mar-2022 09:08

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJL0417 - SMM EPA 7471B

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJL0417-BLK1)						Prepared: 16-Dec-2021 Analyzed: 17-Dec-2021 11:53					
Mercury	ND	0.00525	0.0250	mg/kg							U
LCS (BJL0417-BS1)						Prepared: 16-Dec-2021 Analyzed: 17-Dec-2021 11:55					
Mercury	0.474	0.00525	0.0250	mg/kg	0.500		94.9	80-120			
Duplicate (BJL0417-DUP1)						Source: 21L0122-01 Prepared: 16-Dec-2021 Analyzed: 17-Dec-2021 12:00					
Mercury	0.0234	0.00564	0.0268	mg/kg		0.0292			22.20	20	*, J
Matrix Spike (BJL0417-MS1)						Source: 21L0122-01 Prepared: 16-Dec-2021 Analyzed: 17-Dec-2021 12:09					
Mercury	0.227	0.00569	0.0271	mg/kg	0.271	0.0292	73.0	75-125			*
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJL0417-MSD1)						Source: 21L0122-01 Prepared: 16-Dec-2021 Analyzed: 17-Dec-2021 12:11					
Mercury	0.314	0.00564	0.0268	mg/kg	0.268	0.0292	106	75-125	32.20	20	*
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Soils 2021
 Project Number: 21-1-12596
 Project Manager: Meg Strong

Reported:
 17-Mar-2022 09:08

Analysis by: Analytical Resources, LLC
TCLP Metals and Metallic Compounds - Quality Control
Batch BKC0342 - LEN Digestion of EPA 1311 Elutriate

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKC0342-BLK1)						Prepared: 15-Mar-2022 Analyzed: 15-Mar-2022 17:19					
Chromium	0.0092	0.0024	0.0250	mg/L							J
Duplicate (BKC0342-DUP1)						Source: 21L0122-01 Prepared: 15-Mar-2022 Analyzed: 15-Mar-2022 17:31					
Chromium	0.0120	0.0024	0.0250	mg/L		0.0141			16.60	20	J
Matrix Spike (BKC0342-MS1)						Source: 21L0122-01 Prepared: 15-Mar-2022 Analyzed: 15-Mar-2022 17:37					
Chromium	1.14	0.0024	0.0250	mg/L	1.00	0.0141	112	75-125			

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



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Certified Analyses included in this Report

Analyte	Certifications
EPA 6010D in Solid	
Chromium	NELAP,WADOE,DoD-ELAP
EPA 6020B in Solid	
Silver-107	NELAP,DoD-ELAP,WADOE
Barium-135	NELAP,DoD-ELAP,WADOE,ADEC
Barium-137	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-52	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,WADOE,ADEC
Lead-208	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Solid	
Arsenic-75a	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-114	NELAP,DoD-ELAP,WADOE,ADEC
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP,WADOE
Nickel-60	NELAP,DoD-ELAP,WADOE,ADEC
Nickel-62	NELAP,DoD-ELAP,WADOE,ADEC
Selenium-78	NELAP,DoD-ELAP,WADOE
Zinc-66	NELAP,DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP,WADOE
EPA 7471B in Solid	
Mercury	WADOE,NELAP,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Soils 2021
Project Number: 21-1-12596
Project Manager: Meg Strong

Reported:
17-Mar-2022 09:08

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

01 December 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q4

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.

Associated Work Order(s)
21K0165

Associated SDG ID(s)
N/A

Shelly
Fishel

Digitally signed by
Shelly Fishel
Date: 2021.12.01
18:20:55 -08'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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: 21K0165	Turn-around Requested: Standard	Page: 1 of 1
ARI Client Company: Shannon & Wilson, Inc.	Phone:	Date: 11/9/21 Ice Present?
Client Contact: Shoshana Howard		No. of Coolers: Cooler Temps:



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

Client Project Name: LDW					Analysis Requested										Notes/Comments														
Client Project #: 21-1-12596					Samplers: CTC, RMV																								
Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-DX	BTEX	HVOCs	MTBE	PAHs	SVOCs (Full List)	SVOCs (L.L.)	PCBs Analyzed	Metals (Total + Diss)															
MW-38-20210911	11/9	1325	GW	9	X	X	X							①															
MW-48-20210911	11/9	1210	GW	3			X																						
MW-50-20210911	11/9	1415	GW	9			X	X					X	①															
MW-103-20210911	11/9	1430	GW	9			X	X					X	①															
MW-65-20210911	11/9	1050	GW	17	X	X	X	X	X		X		X	②															
TB-1-20210911	11/9	1220	W	5			X	X																					
Comments/Special Instructions					Relinquished by:					Received by:					Relinquished by:														
Comments/Special Instructions: • Metals are <u>not</u> field filtered. • Reference project for detection limits.					Relinquished by: (Signature) <i>[Signature]</i> Printed Name: Christian Canfield Company: Shannon & Wilson, Inc. Date & Time: 11/9/21 1535					Received by: (Signature) <i>[Signature]</i> Printed Name: Isabelle Bradley Company: ARI Date & Time: 11/9/21 15:35					Relinquished by: (Signature) Printed Name: Company: 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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

RE: LDW Sample Acknowledgment 21K0165

Shoshana Howard <Shoshana.Howard@shanwil.com>

Thu 11/11/2021 2:22 PM

To: Shelly Fishel <shelly.fishel@arilabs.com>; Meg Strong <Meg.Strong@shanwil.com>

Hi Shelly,

Looks good to me. Yes, they forgot to add copper, but it should be on the list for MW-65. Thanks for catching that!

Regards,
Shoshana

Shoshana Howard, PE

SENIOR ENGINEER

SHANNON & WILSON

400 N 34th Street, Suite 100
Seattle, WA 98103
shannonwilson.com

Phone: **(206) 632-8020**Direct: **(206) 695-6811**Mobile: **(206) 900-2720**Shoshana.Howard@shanwil.com

Please note, my email address has been updated. You can still reach me at the old address.

From: Shelly Fishel <shelly.fishel@arilabs.com>**Sent:** Wednesday, November 10, 2021 12:55 PM**To:** Shoshana Howard <Shoshana.Howard@shanwil.com>; Meg Strong <Meg.Strong@shanwil.com>**Subject:** LDW Sample Acknowledgment 21K0165

Hello Shoshana and Meg,

ARI received five water samples plus a trip blank for analysis which were logged in under work order 21K0165. The samples were intact and within temperature compliance. Just wanted to check the metals list for MW-65-20210911. The list on the COC omits Copper from the LDW full list was this intentional? We currently have it logged for copper. Receiving documentation is attached. Please review for accuracy.

Please see the comments at the bottom of the cooler receipt form regarding missing label and probable T and D metals bottle swap.

Be safe and stay healthy!

Regards,

Shelly L Fishel, Project Manager



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-38-20210911	21K0165-01	Water	09-Nov-2021 13:25	09-Nov-2021 15:35
MW-38-20210911	21K0165-02	Water	09-Nov-2021 13:25	09-Nov-2021 15:35
MW-48-20210911	21K0165-03	Water	09-Nov-2021 12:10	09-Nov-2021 15:35
MW-50-20210911	21K0165-04	Water	09-Nov-2021 14:15	09-Nov-2021 15:35
MW-50-20210911	21K0165-05	Water	09-Nov-2021 14:15	09-Nov-2021 15:35
MW-103-20210911	21K0165-06	Water	09-Nov-2021 14:30	09-Nov-2021 15:35
MW-103-20210911	21K0165-07	Water	09-Nov-2021 14:30	09-Nov-2021 15:35
MW-65-20210911	21K0165-08	Water	09-Nov-2021 10:50	09-Nov-2021 15:35
MW-65-20210911	21K0165-09	Water	09-Nov-2021 10:50	09-Nov-2021 15:35
TB-1-20210911	21K0165-10	Water	09-Nov-2021 10:50	09-Nov-2021 15:35



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q4
Work Order: 21K0165

Sample receipt

Samples as listed on the preceding page were received 09-Nov-2021 15:35 under ARI work order 21K0165. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. Pentachlorophenol which was out of control low and Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate and surrogate p- Terphenyl-d14 which were out of control high in the initial calibration verification SJK0381-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier. Pentachlorophenol was out of control low in the continuing calibration verification SJK0381-CCV1. Pentachlorophenol was out of control low and Butylbenzylphthalate was out of control high in the low concentration calibration verification SJK0381-LCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except p- Terphenyl-d14 which was out of control high in the initial calibration verification and Phenol-d5 was out of control low in sample 21K0165-08. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0165-02 in Dissolved Metals batch BJK0618. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0165-09 in Dissolved Mercury batch BJK0491. The



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.



WORK ORDER

21K0165

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0165-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass (P)
21K0165-01 B	Glass NM, Amber, 500 mL		
21K0165-01 C	Glass NM, Amber, 500 mL		
21K0165-01 D	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 E	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 F	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 G	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0165-02 A	HDPE NM, 500 mL	>2	Fail
21K0165-03 A	VOA Vial, Clear, 40 mL, HCL		
21K0165-03 B	VOA Vial, Clear, 40 mL, HCL		
21K0165-03 C	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 A	Glass NM, Amber, 1000 mL		
21K0165-04 B	Glass NM, Amber, 1000 mL		
21K0165-04 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0165-04 D	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 E	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 F	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 G	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 H	VOA Vial, Clear, 40 mL, HCL		
21K0165-05 A	HDPE NM, 500 mL	>2	Fail
21K0165-06 A	Glass NM, Amber, 1000 mL		
21K0165-06 B	Glass NM, Amber, 1000 mL		
21K0165-06 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0165-06 D	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 E	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 F	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 G	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 H	VOA Vial, Clear, 40 mL, HCL		
21K0165-07 A	HDPE NM, 500 mL	>2	Fail
21K0165-08 A	Glass NM, Amber, 1000 mL		
21K0165-08 B	Glass NM, Amber, 1000 mL		
21K0165-08 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0165-08 D	Glass NM, Amber, 500 mL		



WORK ORDER

21K0165

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0165-08 E	Glass NM, Amber, 500 mL		
21K0165-08 F	Glass NM, Amber, 500 mL		
21K0165-08 G	Glass NM, Amber, 500 mL		
21K0165-08 H	Glass NM, Amber, 500 mL		
21K0165-08 I	Glass NM, Amber, 500 mL		
21K0165-08 J	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 K	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 L	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 M	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 N	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 O	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 P	VOA Vial, Clear, 40 mL, HCL		
21K0165-09 A	HDPE NM, 500 mL	>2	Fail
21K0165-10 A	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 E	VOA Vial, Clear, 40 mL, HCL	bubble	

Preservation Confirmed By

Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannor Wilson inc

Project Name: LDW

COC No(s): NA

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

Assigned ARI Job No: 21K0165

Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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 3:05 5:08

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 9708

Cooler Accepted by: LB Date: 11/09/21 Time: 15:35

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: NA

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

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 11/1/21

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: LB Date: 11/10/21 Time: 0852 Labels checked by: _____

**** 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: → for sample MW-65-20210911
 Total metals bottle is missing a label, able to determine which sample as the rest had full labels. After pres check, I believe the dissolved & total metals were swapped accidentally so the bottles have been logged with the preserved bottle as Total Metals (client label says Dissolved)
 By: LB Date: 11/10/21 Lab to determine size & bubbles.



WORK ORDER

21K0165

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0165-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass (P)
21K0165-01 B	Glass NM, Amber, 500 mL		
21K0165-01 C	Glass NM, Amber, 500 mL		
21K0165-01 D	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 E	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 F	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 G	VOA Vial, Clear, 40 mL, HCL		
21K0165-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0165-02 A	HDPE NM, 500 mL	>2	Fail (F)
21K0165-03 A	VOA Vial, Clear, 40 mL, HCL		
21K0165-03 B	VOA Vial, Clear, 40 mL, HCL		
21K0165-03 C	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 A	Glass NM, Amber, 1000 mL		
21K0165-04 B	Glass NM, Amber, 1000 mL		
21K0165-04 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0165-04 D	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 E	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 F	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 G	VOA Vial, Clear, 40 mL, HCL		
21K0165-04 H	VOA Vial, Clear, 40 mL, HCL		
21K0165-05 A	HDPE NM, 500 mL	>2	Fail (F)
21K0165-06 A	Glass NM, Amber, 1000 mL		
21K0165-06 B	Glass NM, Amber, 1000 mL		
21K0165-06 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0165-06 D	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 E	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 F	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 G	VOA Vial, Clear, 40 mL, HCL		
21K0165-06 H	VOA Vial, Clear, 40 mL, HCL		
21K0165-07 A	HDPE NM, 500 mL	>2	Fail (F)
21K0165-08 A	Glass NM, Amber, 1000 mL		
21K0165-08 B	Glass NM, Amber, 1000 mL		
21K0165-08 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0165-08 D	Glass NM, Amber, 500 mL		



WORK ORDER

21K0165

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0165-08 E	Glass NM, Amber, 500 mL		
21K0165-08 F	Glass NM, Amber, 500 mL		
21K0165-08 G	Glass NM, Amber, 500 mL		
21K0165-08 H	Glass NM, Amber, 500 mL		
21K0165-08 I	Glass NM, Amber, 500 mL		
21K0165-08 J	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 K	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 L	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 M	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 N	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 O	VOA Vial, Clear, 40 mL, HCL		
21K0165-08 P	VOA Vial, Clear, 40 mL, HCL		
21K0165-09 A	HDPE NM, 500 mL	>2	Fail ①
21K0165-10 A	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0165-10 E	VOA Vial, Clear, 40 mL, HCL	bubble	

RV

Preservation Confirmed By

Date

11/10/21

① Filtered at 0.45µm and
preserved to pH 2.2 with 0.75mL
conc. HNO₃ (J10414).

ml 11/10/21


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-38-20210911
21K0165-01 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/09/2021 13:25

Instrument: NT3 Analyst: PKC

Analyzed: 11/12/2021 17:09

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-01 E

Preparation Batch: BJK0341

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>				80-120 %	104	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	104	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-38-20210911

21K0165-01 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/09/2021 13:25

Instrument: NT3 Analyst: PKC

Analyzed: 11/12/2021 17:09

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-01 E

Preparation Batch: BJK0341

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	104	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	104	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-38-20210911
21K0165-01 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/09/2021 13:25

Instrument: FID4 Analyst: TWC

Analyzed: 11/19/2021 20:39

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0165-01 B 01

Preparation Batch: BJK0309

Sample Size: 500 mL

Prepared: 11/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>116</i>	<i>%</i>	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-38-20210911
21K0165-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/09/2021 13:25

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 04:09

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0165-01 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	1	0.142	0.500	15.1	ug/L	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-38-20210911
21K0165-02 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/09/2021 13:25

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:47

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0165-02 A 02

Preparation Batch: BJK0618

Sample Size: 25 mL

Filtration Batch: BJK0266

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/10/2021 15:11

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	1	0.142	0.500	6.80	ug/L	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-48-20210911
21K0165-03 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/09/2021 12:10

Instrument: NT3 Analyst: PKC

Analyzed: 11/11/2021 20:13

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-03 A

Preparation Batch: BJK0307

Sample Size: 10 mL

Prepared: 11/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>				80-120 %	105	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	106	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-50-20210911

21K0165-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/09/2021 14:15

Instrument: NT3 Analyst: PKC

Analyzed: 11/11/2021 20:38

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-04 E

Preparation Batch: BJK0307

Sample Size: 10 mL

Prepared: 11/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	2.46	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	0.09	ug/L	J
Benzene	71-43-2	1	0.05	0.20	0.11	ug/L	J
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>					<i>80-129 %</i>	<i>96.7 %</i>	
<i>Surrogate: Toluene-d8</i>					<i>80-120 %</i>	<i>101 %</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>					<i>80-120 %</i>	<i>104 %</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					<i>80-120 %</i>	<i>102 %</i>	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-50-20210911
21K0165-04 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/09/2021 14:15

Instrument: ECD7 Analyst: JGR

Analyzed: 11/16/2021 23:32

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0320 Prepared: 11/12/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0165-04 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0178 Cleaned: 16-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0165-04 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0176 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0165-04 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0177 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0165-04 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	73.3	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	72.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	70.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	67.7	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-50-20210911
21K0165-04 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/09/2021 14:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 04:14

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0165-04 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	1	0.142	0.500	220	ug/L	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-50-20210911
21K0165-05 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/09/2021 14:15

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 21:40

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0165-05 A 02

Preparation Batch: BJK0618

Sample Size: 25 mL

Filtration Batch: BJK0266

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/10/2021 15:11

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	5	0.710	2.50	276	ug/L	D


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-103-20210911
21K0165-06 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/09/2021 14:30

Instrument: NT3 Analyst: PKC

Analyzed: 11/11/2021 21:03

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-06 E

Preparation Batch: BJK0307

Sample Size: 10 mL

Prepared: 11/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	2.03	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	0.09	ug/L	J
Benzene	71-43-2	1	0.05	0.20	0.11	ug/L	J
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>					80-129 %	98.5 %	
<i>Surrogate: Toluene-d8</i>					80-120 %	100 %	
<i>Surrogate: 4-Bromofluorobenzene</i>					80-120 %	104 %	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					80-120 %	97.2 %	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-103-20210911
21K0165-06 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/09/2021 14:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/16/2021 23:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0320 Prepared: 11/12/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0165-06 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0178 Cleaned: 16-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0165-06 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0176 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0165-06 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0177 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0165-06 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	72.8	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	73.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	70.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	68.2	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-103-20210911
21K0165-06 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/09/2021 14:30

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 21:44

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0165-06 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	5	0.710	2.50	322	ug/L	D


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-103-20210911
21K0165-07 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/09/2021 14:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 04:04

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0165-07 A 02

Preparation Batch: BJK0618

Sample Size: 25 mL

Filtration Batch: BJK0266

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/10/2021 15:11

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	1	0.142	0.500	213	ug/L	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-65-20210911

21K0165-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/09/2021 10:50

Instrument: NT3 Analyst: PKC

Analyzed: 11/12/2021 17:34

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-08 J

Preparation Batch: BJK0341

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	0.08	ug/L	J
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>					<i>80-129 %</i>	<i>99.7 %</i>	
<i>Surrogate: Toluene-d8</i>					<i>80-120 %</i>	<i>106 %</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>					<i>80-120 %</i>	<i>103 %</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					<i>80-120 %</i>	<i>103 %</i>	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-65-20210911

21K0165-08 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/09/2021 10:50

Instrument: NT3 Analyst: PKC

Analyzed: 11/12/2021 17:34

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-08 J

Preparation Batch: BJK0341

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	106	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	103	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-65-20210911
21K0165-08 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/09/2021 10:50

Instrument: NT16 Analyst: KOTT

Analyzed: 11/12/2021 17:22

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-08 K

Preparation Batch: BJK0337

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	97.6	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	96.1	%	



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-65-20210911

21K0165-08 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/09/2021 10:50

Instrument: NT10 Analyst: VTS

Analyzed: 11/24/2021 17:46

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0165-08 B 01

Preparation Batch: BJK0334

Sample Size: 1000 mL

Prepared: 11/16/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U

Surrogate: 2-Fluorophenol

30-160 %

39.2 %

Surrogate: Phenol-d5

30-160 %

24.5 %

*

Surrogate: 2-Chlorophenol-d4

30-160 %

77.5 %

Surrogate: 1,2-Dichlorobenzene-d4

30-160 %

45.7 %

Surrogate: Nitrobenzene-d5

30-160 %

69.7 %

Surrogate: 2-Fluorobiphenyl

30-160 %

67.2 %

Surrogate: 2,4,6-Tribromophenol

30-160 %

88.0 %

Surrogate: p-Terphenyl-d14

30-160 %

113 %

Q



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-65-20210911

21K0165-08 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/09/2021 10:50

Instrument: NT11 Analyst: VTS

Analyzed: 11/19/2021 18:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJK0333
Prepared: 11/15/2021

Sample Size: 500 mL
Final Volume: 0.5 mL

Extract ID: 21K0165-08 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.002	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.001	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.0009	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U

Surrogate: 2-Methylnaphthalene-d10

42-120 % 72.7 %

Surrogate: Dibenzo[a,h]anthracene-d14

29-120 % 70.6 %

Surrogate: Fluoranthene-d10

57-120 % 88.6 %


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-65-20210911
21K0165-08 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/09/2021 10:50

Instrument: FID4 Analyst: TWC

Analyzed: 11/19/2021 20:58

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0165-08 D 01

Preparation Batch: BJK0309

Sample Size: 500 mL

Prepared: 11/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>117</i>	<i>%</i>	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

MW-65-20210911

21K0165-08 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 11/09/2021 10:50

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 00:15

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0320 Prepared: 11/12/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0165-08 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0178 Cleaned: 16-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0165-08 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0176 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0165-08 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0177 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0165-08 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				29-120 %	79.0	%	
Surrogate: Tetrachlorometaxylene				32-120 %	67.1	%	
Surrogate: Decachlorobiphenyl [2C]				29-120 %	76.2	%	
Surrogate: Tetrachlorometaxylene [2C]				32-120 %	62.3	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-65-20210911
21K0165-08 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/09/2021 10:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:56

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0165-08 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	20.6	ug/L	
Chromium	7440-47-3	1	0.260	0.500	1.32	ug/L	
Iron	7439-89-6	1	18.2	36.0	5200	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.0740	ug/L	J
Manganese	7439-96-5	10	1.42	5.00	769	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-65-20210911
21K0165-08 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/09/2021 10:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:56

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0165-08 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	1.18	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	0.0500	ug/L	J
Cobalt	7440-48-4	1	0.0178	0.200	0.929	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.40	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	22.9	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.232	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-65-20210911
21K0165-08 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/09/2021 10:50

Instrument: HYDRA Analyst: ML

Analyzed: 11/12/2021 15:31

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0165-08 C

Preparation Batch: BJK0287

Sample Size: 20 mL

Prepared: 11/11/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

MW-65-20210911
21K0165-09 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/09/2021 10:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:01

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0165-09 A 02
	Preparation Batch: BJK0618	Filtration Batch: BJK0266
	Prepared: 11/23/2021	Filtration Date: 11/10/2021 15:11
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium, Dissolved	7440-39-3	1	0.114	0.500	19.2	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	1840	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	741	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-65-20210911
21K0165-09 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/09/2021 10:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:01

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0165-09 A 02
	Preparation Batch: BJK0618	Filtration Batch: BJK0266
	Sample Size: 25 mL	
	Prepared: 11/23/2021	Final Volume: 25 mL
		Filtration Date: 11/10/2021 15:11

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.674	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.886	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.263	ug/L	J
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	22.8	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-65-20210911
21K0165-09 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/09/2021 10:50

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 14:01

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0165-09 A 01

Preparation Batch: BJK0491

Sample Size: 20 mL

Filtration Batch: BJK0266

Prepared: 11/22/2021

Final Volume: 20 mL

Filtration Date: 11/10/2021 15:11

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

TB-1-20210911 21K0165-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/09/2021 10:50

Instrument: NT3 Analyst: PKC

Analyzed: 11/10/2021 14:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BJK0262
Prepared: 11/10/2021

Sample Size: 10 mL
Final Volume: 10 mL

Extract ID: 21K0165-10 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	109	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	98.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	97.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	102	%	


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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TB-1-20210911
21K0165-10 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/09/2021 10:50

Instrument: NT16 Analyst: KOTT

Analyzed: 11/12/2021 16:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0165-10 D

Preparation Batch: BJK0337

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	96.3	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	96.9	%	



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0262 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0262-BLK1)						Prepared: 10-Nov-2021 Analyzed: 10-Nov-2021 12:51					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.75			ug/L	5.00		115	80-129			
<i>Surrogate: Toluene-d8</i>	4.99			ug/L	5.00		99.8	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.60			ug/L	5.00		91.9	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.13			ug/L	5.00		103	80-120			
LCS (BJK0262-BS1)						Prepared: 10-Nov-2021 Analyzed: 10-Nov-2021 11:10					
Vinyl Chloride	9.81	0.08	0.20	ug/L	10.0		98.1	66-133			
1,1-Dichloroethene	9.66	0.08	0.20	ug/L	10.0		96.6	69-135			
trans-1,2-Dichloroethene	8.45	0.07	0.20	ug/L	10.0		84.5	78-128			
cis-1,2-Dichloroethene	8.96	0.08	0.20	ug/L	10.0		89.6	80-121			
Benzene	8.88	0.05	0.20	ug/L	10.0		88.8	80-120			
Trichloroethene	8.71	0.07	0.20	ug/L	10.0		87.1	80-120			
Toluene	8.93	0.05	0.20	ug/L	10.0		89.3	80-120			
Tetrachloroethene	8.88	0.09	0.20	ug/L	10.0		88.8	80-120			
Ethylbenzene	9.42	0.05	0.20	ug/L	10.0		94.2	80-120			
m,p-Xylene	19.0	0.14	0.40	ug/L	20.0		94.9	80-121			
o-Xylene	9.33	0.08	0.20	ug/L	10.0		93.3	80-121			
Xylenes, total	28.3	0.22	0.60	ug/L	30.0		94.4	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.56			ug/L	5.00		111	80-129			
<i>Surrogate: Toluene-d8</i>	5.14			ug/L	5.00		103	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.09			ug/L	5.00		102	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.85			ug/L	5.00		97.0	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0262 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0262-BSD1)						Prepared: 10-Nov-2021	Analyzed: 10-Nov-2021 12:00				
Vinyl Chloride	10.0	0.08	0.20	ug/L	10.0		100	66-133	2.05	30	
1,1-Dichloroethene	10.2	0.08	0.20	ug/L	10.0		102	69-135	5.58	30	
trans-1,2-Dichloroethene	9.00	0.07	0.20	ug/L	10.0		90.0	78-128	6.33	30	
cis-1,2-Dichloroethene	9.35	0.08	0.20	ug/L	10.0		93.5	80-121	4.33	30	
Benzene	9.49	0.05	0.20	ug/L	10.0		94.9	80-120	6.62	30	
Trichloroethene	9.04	0.07	0.20	ug/L	10.0		90.4	80-120	3.73	30	
Toluene	9.13	0.05	0.20	ug/L	10.0		91.3	80-120	2.23	30	
Tetrachloroethene	8.91	0.09	0.20	ug/L	10.0		89.1	80-120	0.41	30	
Ethylbenzene	9.27	0.05	0.20	ug/L	10.0		92.7	80-120	1.70	30	
m,p-Xylene	19.1	0.14	0.40	ug/L	20.0		95.7	80-121	0.78	30	
o-Xylene	9.47	0.08	0.20	ug/L	10.0		94.7	80-121	1.48	30	
Xylenes, total	28.6	0.22	0.60	ug/L	30.0		95.3	76-127	1.01	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	6.03			ug/L	5.00		121	80-129			
<i>Surrogate: Toluene-d8</i>	5.15			ug/L	5.00		103	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.88			ug/L	5.00		97.5	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.08			ug/L	5.00		102	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0307 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0307-BLK1)											
						Prepared: 11-Nov-2021 Analyzed: 11-Nov-2021 16:51					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4.95			ug/L	5.00		99.0	80-129			
Surrogate: Toluene-d8	5.18			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	5.25			ug/L	5.00		105	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.18			ug/L	5.00		104	80-120			
LCS (BJK0307-BS1)											
						Prepared: 11-Nov-2021 Analyzed: 11-Nov-2021 14:55					
Vinyl Chloride	9.01	0.08	0.20	ug/L	10.0		90.1	66-133			
1,1-Dichloroethene	8.47	0.08	0.20	ug/L	10.0		84.7	69-135			
trans-1,2-Dichloroethene	8.68	0.07	0.20	ug/L	10.0		86.8	78-128			
cis-1,2-Dichloroethene	9.22	0.08	0.20	ug/L	10.0		92.2	80-121			
Benzene	9.56	0.05	0.20	ug/L	10.0		95.6	80-120			
Trichloroethene	9.74	0.07	0.20	ug/L	10.0		97.4	80-120			
Toluene	9.95	0.05	0.20	ug/L	10.0		99.5	80-120			
Tetrachloroethene	10.4	0.09	0.20	ug/L	10.0		104	80-120			
Ethylbenzene	10.0	0.05	0.20	ug/L	10.0		100	80-120			
m,p-Xylene	20.2	0.14	0.40	ug/L	20.0		101	80-121			
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Xylenes, total	30.2	0.22	0.60	ug/L	30.0		101	76-127			
Surrogate: 1,2-Dichloroethane-d4	4.64			ug/L	5.00		92.8	80-129			
Surrogate: Toluene-d8	5.20			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	5.60			ug/L	5.00		112	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.81			ug/L	5.00		96.3	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0307 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0307-BSD1)						Prepared: 11-Nov-2021	Analyzed: 11-Nov-2021 16:01				
Vinyl Chloride	9.43	0.08	0.20	ug/L	10.0		94.3	66-133	4.51	30	
1,1-Dichloroethene	9.10	0.08	0.20	ug/L	10.0		91.0	69-135	7.15	30	
trans-1,2-Dichloroethene	9.04	0.07	0.20	ug/L	10.0		90.4	78-128	4.03	30	
cis-1,2-Dichloroethene	10.0	0.08	0.20	ug/L	10.0		100	80-121	8.52	30	
Benzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	5.56	30	
Trichloroethene	9.98	0.07	0.20	ug/L	10.0		99.8	80-120	2.46	30	
Toluene	10.2	0.05	0.20	ug/L	10.0		102	80-120	2.89	30	
Tetrachloroethene	10.6	0.09	0.20	ug/L	10.0		106	80-120	2.00	30	
Ethylbenzene	10.2	0.05	0.20	ug/L	10.0		102	80-120	2.00	30	
m,p-Xylene	21.2	0.14	0.40	ug/L	20.0		106	80-121	5.16	30	
o-Xylene	10.2	0.08	0.20	ug/L	10.0		102	80-121	1.86	30	
Xylenes, total	31.5	0.22	0.60	ug/L	30.0		105	76-127	4.08	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.82			ug/L	5.00		96.3	80-129			
<i>Surrogate: Toluene-d8</i>	5.18			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.11			ug/L	5.00		102	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.78			ug/L	5.00		95.7	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0341 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0341-BLK1)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 15:24								
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.24		ug/L	5.00		105	80-120			
Blank (BJK0341-BLK2)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 15:24								
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	5.06		ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.24		ug/L	5.00		105	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.91		ug/L	5.00		98.2	80-120			
LCS (BJK0341-BS1)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 13:18								
Gasoline Range Organics (Tol-Nap)	988	100	ug/L	1000		98.8	72-128			
Surrogate: Toluene-d8	5.28		ug/L	5.00		106	80-120			
Surrogate: 4-Bromofluorobenzene	5.23		ug/L	5.00		105	80-120			
LCS (BJK0341-BS2)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 13:44								
Vinyl Chloride	9.88	0.08	0.20	ug/L	10.0	98.8	66-133			
1,1-Dichloroethene	9.03	0.08	0.20	ug/L	10.0	90.3	69-135			
trans-1,2-Dichloroethene	9.46	0.07	0.20	ug/L	10.0	94.6	78-128			
cis-1,2-Dichloroethene	9.83	0.08	0.20	ug/L	10.0	98.3	80-121			
Benzene	10.6	0.05	0.20	ug/L	10.0	106	80-120			
Trichloroethene	10.2	0.07	0.20	ug/L	10.0	102	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0341 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0341-BS2)						Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 13:44					
Toluene	10.8	0.05	0.20	ug/L	10.0		108	80-120			
Tetrachloroethene	10.9	0.09	0.20	ug/L	10.0		109	80-120			
Ethylbenzene	10.3	0.05	0.20	ug/L	10.0		103	80-120			
m,p-Xylene	21.3	0.14	0.40	ug/L	20.0		107	80-121			
o-Xylene	10.7	0.08	0.20	ug/L	10.0		107	80-121			
Xylenes, total	32.0	0.22	0.60	ug/L	30.0		107	76-127			
Surrogate: 1,2-Dichloroethane-d4	4.74			ug/L	5.00		94.9	80-129			
Surrogate: Toluene-d8	5.31			ug/L	5.00		106	80-120			
Surrogate: 4-Bromofluorobenzene	5.04			ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.77			ug/L	5.00		95.4	80-120			
LCS Dup (BJK0341-BSD1)						Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 14:09					
Gasoline Range Organics (Tol-Nap)	847		100	ug/L	1000		84.7	72-128	15.40	30	
Surrogate: Toluene-d8	5.20			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	5.21			ug/L	5.00		104	80-120			
LCS Dup (BJK0341-BSD2)						Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 14:34					
Vinyl Chloride	9.20	0.08	0.20	ug/L	10.0		92.0	66-133	7.07	30	
1,1-Dichloroethene	8.84	0.08	0.20	ug/L	10.0		88.4	69-135	2.10	30	
trans-1,2-Dichloroethene	8.68	0.07	0.20	ug/L	10.0		86.8	78-128	8.63	30	
cis-1,2-Dichloroethene	9.09	0.08	0.20	ug/L	10.0		90.9	80-121	7.81	30	
Benzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	5.46	30	
Trichloroethene	9.90	0.07	0.20	ug/L	10.0		99.0	80-120	2.93	30	
Toluene	10.1	0.05	0.20	ug/L	10.0		101	80-120	6.59	30	
Tetrachloroethene	10.7	0.09	0.20	ug/L	10.0		107	80-120	1.70	30	
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	1.34	30	
m,p-Xylene	20.5	0.14	0.40	ug/L	20.0		103	80-121	3.78	30	
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121	5.05	30	
Xylenes, total	30.7	0.22	0.60	ug/L	30.0		102	76-127	4.20	30	
Surrogate: 1,2-Dichloroethane-d4	4.84			ug/L	5.00		96.9	80-129			
Surrogate: Toluene-d8	5.14			ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	5.55			ug/L	5.00		111	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.83			ug/L	5.00		96.6	80-120			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - SIM - Quality Control
Batch BJK0337 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0337-BLK1)					Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 12:01						
Vinyl chloride	ND	5.01	20.0	ng/L							U
Surrogate: 1,2-Dichloroethane-d4	5030			ng/L	5000		101	80-129			
Surrogate: Toluene-d8	5190			ng/L	5000		104	80-120			
Surrogate: 4-Bromofluorobenzene	4950			ng/L	5000		99.1	75-125			
LCS (BJK0337-BS1)					Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 10:03						
Vinyl chloride	2210	5.01	20.0	ng/L	2000		111	62-141			
Surrogate: 1,2-Dichloroethane-d4	5780			ng/L	5000		116	80-129			
Surrogate: Toluene-d8	5340			ng/L	5000		107	80-120			
Surrogate: 4-Bromofluorobenzene	5290			ng/L	5000		106	75-125			
LCS Dup (BJK0337-BSD1)					Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 11:07						
Vinyl chloride	2480	5.01	20.0	ng/L	2000		124	62-141	11.20	30	
Surrogate: 1,2-Dichloroethane-d4	5270			ng/L	5000		105	80-129			
Surrogate: Toluene-d8	5310			ng/L	5000		106	80-120			
Surrogate: 4-Bromofluorobenzene	5200			ng/L	5000		104	75-125			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BJK0334 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0334-BLK1)											
						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 15:52					
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
Surrogate: 2-Fluorophenol	3.70			ug/L	7.50		49.3	30-160			
Surrogate: Phenol-d5	2.41			ug/L	7.50		32.2	30-160			
Surrogate: 2-Chlorophenol-d4	6.64			ug/L	7.50		88.6	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	2.61			ug/L	5.00		52.2	30-160			
Surrogate: Nitrobenzene-d5	4.08			ug/L	5.00		81.6	30-160			
Surrogate: 2-Fluorobiphenyl	3.96			ug/L	5.00		79.2	30-160			
Surrogate: 2,4,6-Tribromophenol	7.78			ug/L	7.50		104	30-160			
Surrogate: p-Terphenyl-d14	7.54			ug/L	5.00		151	30-160			Q
LCS (BJK0334-BS1)											
						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 16:30					
1,4-Dichlorobenzene	2.1	0.03	0.2	ug/L	5.00		41.3	30-160			
1,2-Dichlorobenzene	1.9	0.03	0.2	ug/L	5.00		38.2	30-160			
2,4-Dimethylphenol	10.1	0.3	1.0	ug/L	13.0		77.7	30-160			
Benzoic acid	8.7	0.1	2.0	ug/L	23.0		37.7	30-160			
N-Nitrosodiphenylamine	4.4	0.03	0.2	ug/L	5.00		87.1	30-160			
Pentachlorophenol	5.3	0.1	1.0	ug/L	13.0		40.6	30-160			Q
Di-n-Butylphthalate	4.9	0.05	0.2	ug/L	5.00		97.5	30-160			
Butylbenzylphthalate	6.0	0.07	0.2	ug/L	5.00		120	30-160			Q
bis(2-Ethylhexyl)phthalate	5.4	0.2	0.2	ug/L	5.00		108	30-160			Q
Surrogate: 2-Fluorophenol	3.80			ug/L	7.50		50.7	30-160			
Surrogate: Phenol-d5	2.60			ug/L	7.50		34.7	30-160			
Surrogate: 2-Chlorophenol-d4	5.82			ug/L	7.50		77.6	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	1.92			ug/L	5.00		38.4	30-160			
Surrogate: Nitrobenzene-d5	4.00			ug/L	5.00		80.0	30-160			
Surrogate: 2-Fluorobiphenyl	3.30			ug/L	5.00		66.0	30-160			


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0334 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0334-BS1)						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 16:30					
Surrogate: 2,4,6-Tribromophenol	7.14			ug/L	7.50		95.3	30-160			
Surrogate: p-Terphenyl-d14	6.69			ug/L	5.00		134	30-160			Q
LCS Dup (BJK0334-BSD1)						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 17:08					
1,4-Dichlorobenzene	2.4	0.03	0.2	ug/L	5.00		48.3	30-160	15.60	30	
1,2-Dichlorobenzene	2.2	0.03	0.2	ug/L	5.00		44.2	30-160	14.50	30	
2,4-Dimethylphenol	10.8	0.3	1.0	ug/L	13.0		83.2	30-160	6.74	30	
Benzoic acid	9.0	0.1	2.0	ug/L	23.0		39.1	30-160	3.79	30	
N-Nitrosodiphenylamine	4.7	0.03	0.2	ug/L	5.00		93.2	30-160	6.74	30	
Pentachlorophenol	5.5	0.1	1.0	ug/L	13.0		42.1	30-160	3.73	30	Q
Di-n-Butylphthalate	5.3	0.05	0.2	ug/L	5.00		106	30-160	8.15	30	
Butylbenzylphthalate	6.4	0.07	0.2	ug/L	5.00		129	30-160	7.32	30	Q
bis(2-Ethylhexyl)phthalate	5.9	0.2	0.2	ug/L	5.00		118	30-160	9.31	30	Q
Surrogate: 2-Fluorophenol	4.14			ug/L	7.50		55.2	30-160			
Surrogate: Phenol-d5	2.89			ug/L	7.50		38.6	30-160			
Surrogate: 2-Chlorophenol-d4	6.33			ug/L	7.50		84.4	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	2.30			ug/L	5.00		45.9	30-160			
Surrogate: Nitrobenzene-d5	4.32			ug/L	5.00		86.4	30-160			
Surrogate: 2-Fluorobiphenyl	3.51			ug/L	5.00		70.3	30-160			
Surrogate: 2,4,6-Tribromophenol	7.58			ug/L	7.50		101	30-160			
Surrogate: p-Terphenyl-d14	6.71			ug/L	5.00		134	30-160			Q


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0333 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0333-BLK1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 16:30					
Naphthalene	0.001	0.001	0.010	ug/L							J
2-Methylnaphthalene	ND	0.001	0.010	ug/L							U
1-Methylnaphthalene	ND	0.0009	0.010	ug/L							U
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	0.002	0.002	0.010	ug/L							J
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	0.004	0.001	0.010	ug/L							J
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	0.001	0.001	0.010	ug/L							J
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.200			ug/L	0.300		66.7	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.191			ug/L	0.300		63.8	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.238			ug/L	0.300		79.3	57-120			
LCS (BJK0333-BS1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 17:00					
Naphthalene	0.207	0.001	0.010	ug/L	0.300		68.9	37-120			
2-Methylnaphthalene	0.230	0.001	0.010	ug/L	0.300		76.6	37-120			
1-Methylnaphthalene	0.229	0.0009	0.010	ug/L	0.300		76.5	29-120			
Acenaphthylene	0.247	0.002	0.010	ug/L	0.300		82.5	41-120			
Acenaphthene	0.249	0.003	0.010	ug/L	0.300		83.0	41-120			
Dibenzofuran	0.235	0.002	0.010	ug/L	0.300		78.4	38-120			
Fluorene	0.255	0.002	0.010	ug/L	0.300		85.1	43-120			


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Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0333 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0333-BS1)						Prepared: 15-Nov-2021	Analyzed: 19-Nov-2021 17:00				
Phenanthrene	0.252	0.001	0.010	ug/L	0.300		83.9	41-120			
Anthracene	0.253	0.001	0.010	ug/L	0.300		84.4	40-120			
Carbazole	0.266	0.001	0.010	ug/L	0.300		88.7	30-160			
Fluoranthene	0.262	0.002	0.010	ug/L	0.300		87.4	45-120			
Pyrene	0.264	0.001	0.010	ug/L	0.300		88.1	41-120			
Benzo(a)anthracene	0.269	0.0008	0.010	ug/L	0.300		89.6	42-120			
Chrysene	0.250	0.0009	0.010	ug/L	0.300		83.3	44-120			
Benzo(b)fluoranthene	0.267	0.0005	0.010	ug/L	0.300		88.9	44-120			
Benzo(k)fluoranthene	0.252	0.003	0.010	ug/L	0.300		84.2	50-120			
Benzo(j)fluoranthene	0.241	0.002	0.010	ug/L	0.300		80.4	39-160			
Benzofluoranthenes, Total	0.760	0.004	0.010	ug/L	0.900		84.5	46-120			
Benzo(a)pyrene	0.247	0.002	0.010	ug/L	0.300		82.3	35-120			
Perylene	0.233	0.006	0.010	ug/L	0.300		77.7	30-160			
Indeno(1,2,3-cd)pyrene	0.245	0.001	0.010	ug/L	0.300		81.8	37-120			
Dibenzo(a,h)anthracene	0.241	0.001	0.010	ug/L	0.300		80.3	34-120			
Benzo(g,h,i)perylene	0.203	0.001	0.010	ug/L	0.300		67.6	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.249			ug/L	0.300		82.9	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.240			ug/L	0.300		80.0	29-120			
Surrogate: Fluoranthene-d10	0.291			ug/L	0.300		97.0	57-120			
LCS Dup (BJK0333-BSD1)						Prepared: 15-Nov-2021	Analyzed: 19-Nov-2021 17:30				
Naphthalene	0.223	0.001	0.010	ug/L	0.300		74.5	37-120	7.83	30	
2-Methylnaphthalene	0.245	0.001	0.010	ug/L	0.300		81.5	37-120	6.20	30	
1-Methylnaphthalene	0.243	0.0009	0.010	ug/L	0.300		80.9	29-120	5.68	30	
Acenaphthylene	0.260	0.002	0.010	ug/L	0.300		86.6	41-120	4.84	30	
Acenaphthene	0.260	0.003	0.010	ug/L	0.300		86.8	41-120	4.46	30	
Dibenzofuran	0.245	0.002	0.010	ug/L	0.300		81.8	38-120	4.27	30	
Fluorene	0.261	0.002	0.010	ug/L	0.300		87.2	43-120	2.33	30	
Phenanthrene	0.259	0.001	0.010	ug/L	0.300		86.2	41-120	2.65	30	
Anthracene	0.262	0.001	0.010	ug/L	0.300		87.4	40-120	3.58	30	
Carbazole	0.271	0.001	0.010	ug/L	0.300		90.2	30-160	1.66	30	
Fluoranthene	0.272	0.002	0.010	ug/L	0.300		90.7	45-120	3.67	30	
Pyrene	0.265	0.001	0.010	ug/L	0.300		88.3	41-120	0.23	30	
Benzo(a)anthracene	0.273	0.0008	0.010	ug/L	0.300		90.8	42-120	1.36	30	
Chrysene	0.257	0.0009	0.010	ug/L	0.300		85.5	44-120	2.58	30	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0333 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0333-BSD1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 17:30					
Benzo(b)fluoranthene	0.265	0.0005	0.010	ug/L	0.300		88.2	44-120	0.81	30	
Benzo(k)fluoranthene	0.257	0.003	0.010	ug/L	0.300		85.5	50-120	1.64	30	
Benzo(j)fluoranthene	0.248	0.002	0.010	ug/L	0.300		82.8	39-160	3.00	30	
Benzofluoranthenes, Total	0.770	0.004	0.010	ug/L	0.900		85.5	46-120	1.23	30	
Benzo(a)pyrene	0.251	0.002	0.010	ug/L	0.300		83.7	35-120	1.60	30	
Perylene	0.238	0.006	0.010	ug/L	0.300		79.2	30-160	1.85	30	
Indeno(1,2,3-cd)pyrene	0.245	0.001	0.010	ug/L	0.300		81.7	37-120	0.13	30	
Dibenzo(a,h)anthracene	0.240	0.001	0.010	ug/L	0.300		80.0	34-120	0.38	30	
Benzo(g,h,i)perylene	0.202	0.001	0.010	ug/L	0.300		67.4	38-120	0.32	30	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.255			ug/L	0.300		85.1	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.230			ug/L	0.300		76.7	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.284			ug/L	0.300		94.6	57-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJK0309 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0309-BLK1)									
				Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 19:21					
Diesel Range Organics (C12-C24)	ND	0.100	mg/L						U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L						U
Surrogate: <i>o</i> -Terphenyl	0.279		mg/L	0.225	124	50-150			
LCS (BJK0309-BS1)									
				Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 19:41					
Diesel Range Organics (C12-C24)	2.59	0.100	mg/L	3.00	86.4	56-120			
Surrogate: <i>o</i> -Terphenyl	0.224		mg/L	0.225	99.6	50-150			
LCS Dup (BJK0309-BSD1)									
				Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 20:00					
Diesel Range Organics (C12-C24)	2.66	0.100	mg/L	3.00	88.7	56-120	2.60	30	
Surrogate: <i>o</i> -Terphenyl	0.231		mg/L	0.225	102	50-150			



Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJK0320 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0320-BLK1)						Prepared: 12-Nov-2021 Analyzed: 16-Nov-2021 22:06					
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0150			ug/L	0.0200		75.2	29-120			
Surrogate: Tetrachlorometaxylene	0.0142			ug/L	0.0200		71.0	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0130			ug/L	0.0200		64.8	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0131			ug/L	0.0200		65.5	32-120			
LCS (BJK0320-BS1)						Prepared: 12-Nov-2021 Analyzed: 16-Nov-2021 22:28					
Aroclor 1016 [2C]	0.042	0.002	0.010	ug/L	0.0500		83.7	54-120			
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		81.9	51-128			
Surrogate: Decachlorobiphenyl	0.0147			ug/L	0.0200		73.6	29-120			
Surrogate: Tetrachlorometaxylene	0.0128			ug/L	0.0200		64.2	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0139			ug/L	0.0200		69.4	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0119			ug/L	0.0200		59.4	32-120			
LCS Dup (BJK0320-BSD1)						Prepared: 12-Nov-2021 Analyzed: 16-Nov-2021 22:49					
Aroclor 1016 [2C]	0.045	0.002	0.010	ug/L	0.0500		89.5	54-120	6.73	30	
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		82.6	51-128	0.79	30	
Surrogate: Decachlorobiphenyl	0.0146			ug/L	0.0200		72.8	29-120			
Surrogate: Tetrachlorometaxylene	0.0138			ug/L	0.0200		68.8	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0138			ug/L	0.0200		69.2	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0127			ug/L	0.0200		63.6	32-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0287 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0287-BLK1)										
						Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:08			
Mercury	0.000026	0.000013	0.000100	mg/L						J
LCS (BJK0287-BS1)										
						Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:15			
Mercury	0.00167	0.000013	0.000100	mg/L	0.00200		83.4	80-120		


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0508 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0508-BLK1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 22:46						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Manganese	55	0.176	0.142	0.500	ug/L							J
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.179	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U
LCS (BJK0508-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 22:50						
Barium	135	23.8	0.114	0.500	ug/L	25.0		95.1	80-120			
Barium	137	23.7	0.0765	0.500	ug/L	25.0		94.8	80-120			
Chromium	52	24.3	0.260	0.500	ug/L	25.0		97.4	80-120			
Chromium	53	25.0	0.239	0.500	ug/L	25.0		99.9	80-120			
Iron	54	5160	18.2	36.0	ug/L	5000		103	80-120			
Iron	57	5260	6.63	36.0	ug/L	5000		105	80-120			
Lead	208	25.6	0.0513	0.100	ug/L	25.0		103	80-120			
Manganese	55	24.3	0.142	0.500	ug/L	25.0		97.1	80-120			
Silver	107	26.9	0.0220	0.200	ug/L	25.0		108	80-120			
Vanadium	51a	23.7	0.0556	0.200	ug/L	25.0		94.7	80-120			
Vanadium	51b	23.9	0.0521	0.200	ug/L	25.0		95.5	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0508 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0508-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 22:50						
Arsenic	75a	25.0	0.0373	0.200	ug/L	25.0		99.8	80-120			
Cadmium	111	25.9	0.0300	0.100	ug/L	25.0		104	80-120			
Cadmium	114	25.7	0.0400	0.100	ug/L	25.0		103	80-120			
Cobalt	59	26.1	0.0178	0.200	ug/L	25.0		105	80-120			
Copper	63	26.9	0.173	0.500	ug/L	25.0		108	80-120			
Copper	65	26.2	0.350	0.500	ug/L	25.0		105	80-120			
Nickel	60	26.0	0.0792	0.500	ug/L	25.0		104	80-120			
Nickel	62	26.8	0.220	0.500	ug/L	25.0		107	80-120			
Selenium	78	78.8	0.179	0.500	ug/L	80.0		98.5	80-120			
Zinc	66	83.2	2.92	6.00	ug/L	80.0		104	80-120			
Zinc	67	78.2	0.940	6.00	ug/L	80.0		97.8	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0491 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0491-BLK1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 13:56					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L							U
LCS (BJK0491-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 13:58					
Mercury, Dissolved	0.00179	0.000013	0.000100	mg/L	0.00200		89.4	80-120			
Duplicate (BJK0491-DUP1)						Source: 21K0165-09 Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 14:03					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJK0491-MS1)						Source: 21K0165-09 Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 14:05					
Mercury, Dissolved	0.000878	0.000013	0.000100	mg/L	0.00100	ND	87.8	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJK0491-MSD1)						Source: 21K0165-09 Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 14:08					
Mercury, Dissolved	0.000926	0.000013	0.000100	mg/L	0.00100	ND	92.6	75-125	5.33	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0618 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0618-BLK1)						Prepared: 23-Nov-2021 Analyzed: 23-Nov-2021 20:21						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	18.2	36.0	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Silver, Dissolved	107	0.0230	0.0220	0.200	ug/L							J
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	0.0310	0.0178	0.200	ug/L							J
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	0.186	0.179	0.500	ug/L							J
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
LCS (BJK0618-BS1)						Prepared: 23-Nov-2021 Analyzed: 23-Nov-2021 20:26						
Barium, Dissolved	135	25.4	0.114	0.500	ug/L	25.0		102	80-120			
Barium, Dissolved	137	25.5	0.0765	0.500	ug/L	25.0		102	80-120			
Chromium, Dissolved	52	25.0	0.260	0.500	ug/L	25.0		100	80-120			
Chromium, Dissolved	53	25.7	0.239	0.500	ug/L	25.0		103	80-120			
Iron, Dissolved	54	5250	18.2	36.0	ug/L	5000		105	80-120			
Iron, Dissolved	57	5380	18.2	36.0	ug/L	5000		108	80-120			
Lead, Dissolved	208	26.2	0.0513	0.100	ug/L	25.0		105	80-120			
Manganese, Dissolved	55	25.4	0.142	0.500	ug/L	25.0		102	80-120			
Silver, Dissolved	107	28.3	0.0220	0.200	ug/L	25.0		113	80-120			
Vanadium, Dissolved	51a	24.8	0.0556	0.200	ug/L	25.0		99.3	80-120			
Vanadium, Dissolved	51b	25.0	0.0521	0.200	ug/L	25.0		100	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0618 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0618-BS1)						Prepared: 23-Nov-2021 Analyzed: 23-Nov-2021 20:26						
Arsenic, Dissolved	75a	25.4	0.0373	0.200	ug/L	25.0		102	80-120			
Cadmium, Dissolved	111	25.8	0.0300	0.100	ug/L	25.0		103	80-120			
Cadmium, Dissolved	114	25.8	0.0400	0.100	ug/L	25.0		103	80-120			
Cobalt, Dissolved	59	26.9	0.0178	0.200	ug/L	25.0		108	80-120			
Copper, Dissolved	63	27.0	0.173	0.500	ug/L	25.0		108	80-120			
Copper, Dissolved	65	26.8	0.350	0.500	ug/L	25.0		107	80-120			
Nickel, Dissolved	60	26.8	0.0792	0.500	ug/L	25.0		107	80-120			
Nickel, Dissolved	62	26.0	0.220	0.500	ug/L	25.0		104	80-120			
Selenium, Dissolved	78	78.0	0.179	0.500	ug/L	80.0		97.5	80-120			
Zinc, Dissolved	66	81.5	2.92	6.00	ug/L	80.0		102	80-120			
Zinc, Dissolved	67	80.5	0.940	6.00	ug/L	80.0		101	80-120			
Duplicate (BJK0618-DUP1)						Source: 21K0165-02 Prepared: 23-Nov-2021 Analyzed: 23-Nov-2021 21:52						
Barium, Dissolved	135	6.48	0.114	0.500	ug/L		6.30			2.75	20	
Chromium, Dissolved	52	ND	0.260	0.500	ug/L		ND					U
Iron, Dissolved	54	ND	18.2	36.0	ug/L		ND					U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L		ND					U
Manganese, Dissolved	55	6.80	0.142	0.500	ug/L		6.80			0.10	20	
Silver, Dissolved	107	ND	0.0220	0.200	ug/L		ND					U
Vanadium, Dissolved	51a	2.04	0.0556	0.200	ug/L		2.02			0.89	20	
Arsenic, Dissolved	75a	0.375	0.0373	0.200	ug/L		0.375			0.00		
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L		0.0310					U
Cobalt, Dissolved	59	0.0670	0.0178	0.200	ug/L		0.0660			1.50	20	J
Copper, Dissolved	63	1.98	0.173	0.500	ug/L		2.03			2.54	20	
Nickel, Dissolved	60	0.529	0.0792	0.500	ug/L		0.571			7.64	20	
Selenium, Dissolved	78	0.859	0.179	0.500	ug/L		0.812			5.63	20	
Zinc, Dissolved	66	ND	2.92	6.00	ug/L		ND					U
Matrix Spike (BJK0618-MS1)						Source: 21K0165-02 Prepared: 23-Nov-2021 Analyzed: 23-Nov-2021 21:57						
Barium, Dissolved	135	32.2	0.114	0.500	ug/L	25.0	6.30	104	75-125			
Chromium, Dissolved	52	21.0	0.260	0.500	ug/L	25.0	ND	84.1	75-125			
Iron, Dissolved	54	4420	18.2	36.0	ug/L	5000	ND	88.4	75-125			
Lead, Dissolved	208	26.5	0.0513	0.100	ug/L	25.0	ND	106	75-125			
Manganese, Dissolved	55	28.2	0.142	0.500	ug/L	25.0	6.80	85.7	75-125			
Silver, Dissolved	107	28.3	0.0220	0.200	ug/L	25.0	ND	113	75-125			


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:02

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0618 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJK0618-MS1)		Source: 21K0165-02			Prepared: 23-Nov-2021		Analyzed: 23-Nov-2021 21:57					
Vanadium, Dissolved	51a	23.3	0.0556	0.200	ug/L	25.0	2.02	85.0	75-125			
Arsenic, Dissolved	75a	26.0	0.0373	0.200	ug/L	25.0	0.375	102	75-125			
Cadmium, Dissolved	111	25.9	0.0300	0.100	ug/L	25.0	0.0310	103	75-125			
Cobalt, Dissolved	59	27.0	0.0178	0.200	ug/L	25.0	0.0660	108	75-125			
Copper, Dissolved	63	28.8	0.173	0.500	ug/L	25.0	2.03	107	75-125			
Nickel, Dissolved	60	27.1	0.0792	0.500	ug/L	25.0	0.571	106	75-125			
Selenium, Dissolved	78	77.6	0.179	0.500	ug/L	80.0	0.812	96.0	75-125			
Zinc, Dissolved	66	80.8	2.92	6.00	ug/L	80.0	ND	101	75-125			

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

Matrix Spike Dup (BJK0618-MSD1)		Source: 21K0165-02			Prepared: 23-Nov-2021		Analyzed: 23-Nov-2021 22:03					
Barium, Dissolved	135	30.6	0.114	0.500	ug/L	25.0	6.30	97.0	75-125	5.23	20	
Chromium, Dissolved	52	20.6	0.260	0.500	ug/L	25.0	ND	82.5	75-125	1.90	20	
Iron, Dissolved	54	4330	18.2	36.0	ug/L	5000	ND	86.7	75-125	1.93	20	
Lead, Dissolved	208	25.2	0.0513	0.100	ug/L	25.0	ND	101	75-125	5.15	20	
Manganese, Dissolved	55	27.6	0.142	0.500	ug/L	25.0	6.80	83.2	75-125	2.24	20	
Silver, Dissolved	107	26.8	0.0220	0.200	ug/L	25.0	ND	107	75-125	5.35	20	
Vanadium, Dissolved	51a	22.3	0.0556	0.200	ug/L	25.0	2.02	80.9	75-125	4.44	20	
Arsenic, Dissolved	75a	24.8	0.0373	0.200	ug/L	25.0	0.375	97.6	75-125	4.74	20	
Cadmium, Dissolved	111	24.5	0.0300	0.100	ug/L	25.0	0.0310	98.0	75-125	5.31	20	
Cobalt, Dissolved	59	26.4	0.0178	0.200	ug/L	25.0	0.0660	105	75-125	2.15	20	
Copper, Dissolved	63	27.8	0.173	0.500	ug/L	25.0	2.03	103	75-125	3.51	20	
Nickel, Dissolved	60	26.4	0.0792	0.500	ug/L	25.0	0.571	104	75-125	2.51	20	
Selenium, Dissolved	78	74.6	0.179	0.500	ug/L	80.0	0.812	92.2	75-125	4.02	20	
Zinc, Dissolved	66	77.4	2.92	6.00	ug/L	80.0	ND	96.7	75-125	4.40	20	

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



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
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Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 6020B in Water</i>	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
<i>EPA 6020B UCT-KED in Water</i>	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC


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Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE


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Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE


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m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE


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1,2-Dichloroethane

NELAP,WADOE

Benzene

NELAP,WADOE

EPA 8270E in Water

Phenol

NELAP,DoD-ELAP

bis(2-chloroethyl) ether

NELAP,DoD-ELAP

2-Chlorophenol

NELAP,DoD-ELAP

1,3-Dichlorobenzene

NELAP,DoD-ELAP

1,4-Dichlorobenzene

NELAP,DoD-ELAP

1,2-Dichlorobenzene

NELAP,DoD-ELAP

Benzyl Alcohol

NELAP,DoD-ELAP

2,2'-Oxybis(1-chloropropane)

NELAP,DoD-ELAP

2-Methylphenol

NELAP,DoD-ELAP

Hexachloroethane

NELAP,DoD-ELAP

N-Nitroso-di-n-Propylamine

NELAP,DoD-ELAP

4-Methylphenol

NELAP,DoD-ELAP

Nitrobenzene

NELAP,DoD-ELAP

Isophorone

NELAP,DoD-ELAP

2-Nitrophenol

NELAP,DoD-ELAP

2,4-Dimethylphenol

NELAP,DoD-ELAP

Bis(2-Chloroethoxy)methane

NELAP,DoD-ELAP

2,4-Dichlorophenol

NELAP,DoD-ELAP

1,2,4-Trichlorobenzene

NELAP,DoD-ELAP

Naphthalene

NELAP,DoD-ELAP

Benzoic acid

NELAP,DoD-ELAP

4-Chloroaniline

NELAP,DoD-ELAP

Hexachlorobutadiene

NELAP,DoD-ELAP

4-Chloro-3-Methylphenol

NELAP,DoD-ELAP

2-Methylnaphthalene

NELAP,DoD-ELAP

Hexachlorocyclopentadiene

NELAP,DoD-ELAP

2,4,6-Trichlorophenol

NELAP,DoD-ELAP

2,4,5-Trichlorophenol

NELAP,DoD-ELAP

2-Chloronaphthalene

NELAP,DoD-ELAP

2-Nitroaniline

NELAP,DoD-ELAP

Acenaphthylene

NELAP,DoD-ELAP

Dimethylphthalate

NELAP,DoD-ELAP

2,6-Dinitrotoluene

NELAP,DoD-ELAP

Acenaphthene

NELAP,DoD-ELAP

3-Nitroaniline

NELAP,DoD-ELAP

2,4-Dinitrophenol

NELAP,DoD-ELAP


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Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)fluoranthene, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE


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Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE


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Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022


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Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
J	Estimated concentration value detected below the reporting limit.
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

01 December 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q4

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.

Associated Work Order(s)
21K0213

Associated SDG ID(s)
N/A

Shelly Fishel

Digitally signed by Shelly
Fishel
Date: 2021.12.01 18:47:01
-08'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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: 21K0213		Turn-around Requested: Standard		Page: 1 of 1		
ARI Client Company: Shannon & Wilson, Inc.		Phone: 2		Date: 11/10/21	Ice Present? Y	
Client Contact: Sheshana Howard		No. of Coolers: 2		Cooler Temps: 3.5, 3.4		
Client Project Name: 21-1-12596 LDW		Analysis Requested				
Client Project #: 21-1-12596	Samplers: CTC, RMV		Notes/Comments			
Sample ID	Date	Time	Matrix	No. Containers	TPH-G TPH-DX BTEX HVOCs MTBE PAHs SVOCs (Full List) SVOCs (L.L.) PBBs Analyzers Metals (Total + Diss.)	Notes/Comments
MW-9-20211011	11/10	1030	GW	9	X X X	① As, Mn, Cd, Cu
MW-9MS-20211011	11/10	1045	GW	9	X X X	② As
MW-25-20211011	11/10	1205	GW	9	X X	③ As, Ba, Cr, Mn, Ni, Cd, Co, Cu, Fe, Pb, Hg, Se, Ag, V, Zn
MW-66-20211011	11/10	1330	GW	13	X X X X	②
EB-1-20211011	11/10	1351	W	17	X X X X X	③
TB-2-20211011	11/10	1245	W	5	X X	③
Comments/Special Instructions • metals are not field filtered • Reference project for detection limits Relinquished by: (Signature) <i>Rose Vogt</i> Printed Name: Rose Vogt Company: Shannon & Wilson Date & Time: 11/10/2021 15:40 Received by: (Signature) <i>Raven Barbera</i> Printed Name: Raven Barbera Company: ARI Date & Time: 11/10/21 1540 Relinquished by: (Signature) Printed Name: Company: Date & Time:						



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

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, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-9-20211011	21K0213-01	Water	10-Nov-2021 10:30	10-Nov-2021 15:40
MW-9-20211011	21K0213-02	Water	10-Nov-2021 10:30	10-Nov-2021 15:40
MW-25-20211011	21K0213-05	Water	10-Nov-2021 12:05	10-Nov-2021 15:40
MW-25-20211011	21K0213-06	Water	10-Nov-2021 12:05	10-Nov-2021 15:40
MW-66-20211011	21K0213-07	Water	10-Nov-2021 13:30	10-Nov-2021 15:40
MW-66-20211011	21K0213-08	Water	10-Nov-2021 13:30	10-Nov-2021 15:40
EB-1-20211011	21K0213-09	Water	10-Nov-2021 13:51	10-Nov-2021 15:40
EB-1-20211011	21K0213-10	Water	10-Nov-2021 13:51	10-Nov-2021 15:40
TB-2-20211011	21K0213-11	Water	10-Nov-2021 12:45	10-Nov-2021 15:40



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q4
Work Order: 21K0213

Sample receipt

Samples as listed on the preceding page were received 10-Nov-2021 15:40 under ARI work order 21K0213. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. Pentachlorophenol which was out of control low and Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate and surrogate p- Terphenyl-d14 which were out of control high in the initial calibration verification SJK0381-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier. Pentachlorophenol was out of control low in the continuing calibration verification SJK0381-CCV1. Pentachlorophenol and Benzoic Acid were out of control low and Butylbenzylphthalate was out of control high in the low concentration calibration verification SJK0381-LCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except p- Terphenyl-d14 which was out of control high in the initial calibration verification and Phenol-d5 was out of control low in sample 21K0213-09. Deviations have been flagged.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0213-02 in Dissolved Metals batch BJK0585 and in association with sample 21K0213-09 in Total Metals batch BJK0507. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Total Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Sample specific QC was performed in association with sample 21K0213-08 in Dissolved Mercury batch BJK0413 and in association with sample 21K0213-07 in Total Mercury batch BJK0287. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.



Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/11/2021 9:44:09AM

WORK ORDER

21K0213

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0213-01 A	HDPE NM, 500 mL, 1:1 HNO ₃	<2	Pass (P)
21K0213-01 B	Glass NM, Amber, 500 mL		
21K0213-01 C	Glass NM, Amber, 500 mL		
21K0213-01 D	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 E	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 F	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 G	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-02 A	HDPE NM, 500 mL	>2	Fail
21K0213-03 A	HDPE NM, 500 mL, 1:1 HNO ₃	<2	P
21K0213-03 B	Glass NM, Amber, 500 mL		
21K0213-03 C	Glass NM, Amber, 500 mL		
21K0213-03 D	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 E	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 F	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 G	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-04 A	HDPE NM, 500 mL	>2	Fail
21K0213-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	<2	P
21K0213-05 B	Glass NM, Amber, 500 mL		
21K0213-05 C	Glass NM, Amber, 500 mL		
21K0213-05 D	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 E	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 F	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 G	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-06 A	HDPE NM, 500 mL	>2	Fail
21K0213-07 A	Glass NM, Amber, 1000 mL		
21K0213-07 B	Glass NM, Amber, 1000 mL		
21K0213-07 C	HDPE NM, 500 mL, 1:1 HNO ₃	<2	P
21K0213-07 D	Glass NM, Amber, 500 mL		
21K0213-07 E	Glass NM, Amber, 500 mL		
21K0213-07 F	Glass NM, Amber, 500 mL		
21K0213-07 G	Glass NM, Amber, 500 mL		

Reviewed By

Date

Page 1 of 2



Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/11/2021 9:44:09AM

WORK ORDER

21K0213

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0213-07 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 I	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 J	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 K	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 L	VOA Vial, Clear, 40 mL, HCL		
21K0213-08 A	HDPE NM, 500 mL	>2	Fail
21K0213-09 A	Glass NM, Amber, 1000 mL		
21K0213-09 B	Glass NM, Amber, 1000 mL		
21K0213-09 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0213-09 D	Glass NM, Amber, 500 mL		
21K0213-09 E	Glass NM, Amber, 500 mL		
21K0213-09 F	Glass NM, Amber, 500 mL		
21K0213-09 G	Glass NM, Amber, 500 mL		
21K0213-09 H	Glass NM, Amber, 500 mL		
21K0213-09 I	Glass NM, Amber, 500 mL		
21K0213-09 J	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 K	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 L	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 M	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 N	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 O	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 P	VOA Vial, Clear, 40 mL, HCL		
21K0213-10 A	HDPE NM, 500 mL	>2	Fail
21K0213-11 A	VOA Vial, Clear, 40 mL, HCL		
21K0213-11 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0213-11 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0213-11 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0213-11 E	VOA Vial, Clear, 40 mL, HCL	bubble	

Preservation Confirmed By RV

Date 11/11/21

Reviewed By _____

Date _____



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: LDW

COC No(s): _____ NA

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

Assigned ARI Job No: 21K0213

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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) 3.5 3.4

Time 1540

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DOO 2565

Cooler Accepted by: RD Date: 11/10/21 Time: 1540

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

How were bottles sealed in plastic bags? Individually Grouped Not

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? RD 11/11/21 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? RD 11/11/21 YES NO

Date VOC Trip Blank was made at ARI NA 11/11/21

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: RD Date: 11/11/21 Time: 0941 Labels checked by: _____

**** 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:

- Trip blank labels by client list BTEX, HVOCs, & MTBE as analysis, but there are no other samples running MTBE. Did not log for MTBE.
- COC lists "Cn" as a metal analysis but it was likely an error for "Cr".

By: RD Date: 11/11/21 • Lab to determine size of VOC vial bubbles



Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/11/2021 9:44:09AM

WORK ORDER

21K0213

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0213-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass (P)
21K0213-01 B	Glass NM, Amber, 500 mL		
21K0213-01 C	Glass NM, Amber, 500 mL		
21K0213-01 D	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 E	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 F	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 G	VOA Vial, Clear, 40 mL, HCL		
21K0213-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-02 A	HDPE NM, 500 mL	>2	Fail (D)
21K0213-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0213-03 B	Glass NM, Amber, 500 mL		
21K0213-03 C	Glass NM, Amber, 500 mL		
21K0213-03 D	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 E	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 F	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 G	VOA Vial, Clear, 40 mL, HCL		
21K0213-03 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-04 A	HDPE NM, 500 mL	>2	Fail (D)
21K0213-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0213-05 B	Glass NM, Amber, 500 mL		
21K0213-05 C	Glass NM, Amber, 500 mL		
21K0213-05 D	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 E	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 F	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 G	VOA Vial, Clear, 40 mL, HCL		
21K0213-05 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-06 A	HDPE NM, 500 mL	>2	Fail (D)
21K0213-07 A	Glass NM, Amber, 1000 mL		
21K0213-07 B	Glass NM, Amber, 1000 mL		
21K0213-07 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0213-07 D	Glass NM, Amber, 500 mL		
21K0213-07 E	Glass NM, Amber, 500 mL		
21K0213-07 F	Glass NM, Amber, 500 mL		
21K0213-07 G	Glass NM, Amber, 500 mL		

Reviewed By

Date



Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/11/2021 9:44:09AM

WORK ORDER

21K0213

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0213-07 H	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 I	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 J	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 K	VOA Vial, Clear, 40 mL, HCL		
21K0213-07 L	VOA Vial, Clear, 40 mL, HCL		
21K0213-08 A	HDPE NM, 500 mL	>2	Fail (1)
21K0213-09 A	Glass NM, Amber, 1000 mL		
21K0213-09 B	Glass NM, Amber, 1000 mL		
21K0213-09 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0213-09 D	Glass NM, Amber, 500 mL		
21K0213-09 E	Glass NM, Amber, 500 mL		
21K0213-09 F	Glass NM, Amber, 500 mL		
21K0213-09 G	Glass NM, Amber, 500 mL		
21K0213-09 H	Glass NM, Amber, 500 mL		
21K0213-09 I	Glass NM, Amber, 500 mL		
21K0213-09 J	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 K	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 L	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 M	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 N	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 O	VOA Vial, Clear, 40 mL, HCL		
21K0213-09 P	VOA Vial, Clear, 40 mL, HCL		
21K0213-10 A	HDPE NM, 500 mL	>2	Fail (1)
21K0213-11 A	VOA Vial, Clear, 40 mL, HCL		
21K0213-11 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0213-11 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0213-11 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0213-11 E	VOA Vial, Clear, 40 mL, HCL	bubble	

Preservation Confirmed By RM

Date 11/11/21

(1) Filtered at 0.45 microns
& preserved TOPH < 2.0
with 0.75 mL conc. HNO₃
(J 10414)
MM 11/11/21

Reviewed By _____

Date _____


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

MW-9-20211011
21K0213-01 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/10/2021 10:30

Instrument: NT3 Analyst: PKC

Analyzed: 11/18/2021 17:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-01 H

Preparation Batch: BJK0477

Sample Size: 10 mL

Prepared: 11/18/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>				80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	103	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-9-20211011
21K0213-01 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/10/2021 10:30

Instrument: NT3 Analyst: PKC

Analyzed: 11/18/2021 17:14

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-01 H

Preparation Batch: BJK0477

Sample Size: 10 mL

Prepared: 11/18/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	103	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-9-20211011
21K0213-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/10/2021 10:30

Instrument: FID4 Analyst: TWC

Analyzed: 11/19/2021 21:18

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0213-01 B 01

Preparation Batch: BJK0309

Sample Size: 500 mL

Prepared: 11/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>108</i>	<i>%</i>	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-9-20211011
21K0213-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/10/2021 10:30

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 20:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJK0507 Sample Size: 25 mL
Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-01 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	2	0.284	1.00	146	ug/L	D



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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-9-20211011
21K0213-01 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:26

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJK0507 Sample Size: 25 mL
Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-01 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	1.81	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	0.183	ug/L	
Copper	7440-50-8	1	0.173	0.500	2.21	ug/L	



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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-9-20211011

21K0213-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/10/2021 10:30

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 20:41

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21K0213-02 A 03

Preparation Batch: BJK0585

Sample Size: 25 mL

Filtration Batch: BJK0299

Prepared: 11/22/2021

Final Volume: 25 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	2	0.284	1.00	115	ug/L	D



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-9-20211011

21K0213-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 20:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0213-02 A 03

Preparation Batch: BJK0585

Sample Size: 25 mL

Filtration Batch: BJK0299

Prepared: 11/22/2021

Final Volume: 25 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.578	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	0.110	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	1.07	ug/L	



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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-25-20211011

21K0213-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/10/2021 12:05

Instrument: NT3 Analyst: PKC

Analyzed: 11/11/2021 22:22

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-05 F

Preparation Batch: BJK0307

Sample Size: 10 mL

Prepared: 11/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	112	%	
Surrogate: Toluene-d8				80-120 %	99.8	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	101	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	98.0	%	



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Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-25-20211011

21K0213-05 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/10/2021 12:05

Instrument: NT16 Analyst: KOTT

Analyzed: 11/15/2021 21:21

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-05 D

Preparation Batch: BJK0398

Sample Size: 10 mL

Prepared: 11/15/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	98.0	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.3	%	


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Reported:
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MW-25-20211011
21K0213-05 (Water)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/10/2021 12:05

Instrument: NT11 Analyst: VTS

Analyzed: 11/19/2021 18:30

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0333
 Prepared: 11/15/2021

 Sample Size: 500 mL
 Final Volume: 0.5 mL

Extract ID: 21K0213-05 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.003	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.136	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.003	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.024	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.004	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	0.003	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	0.006	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.004	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	76.9	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	72.5	%	
Surrogate: Fluoranthene-d10				57-120 %	93.4	%	



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Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-25-20211011

21K0213-05 (Water)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 12:05

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:51

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix
Preparation Batch: BJK0507 Sample Size: 25 mL
Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-05 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	9.96	ug/L	



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Analytical Report

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Project: Lower Duwamish Q4
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Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-25-20211011

21K0213-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 12:05

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 03:54

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0213-06 A 03

Preparation Batch: BJK0585

Sample Size: 25 mL

Filtration Batch: BJK0299

Prepared: 11/22/2021

Final Volume: 25 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	5.22	ug/L	


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Reported:
 01-Dec-2021 18:16

MW-66-20211011
21K0213-07 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/10/2021 13:30

Instrument: NT3 Analyst: PKC

Analyzed: 11/11/2021 22:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-07 J

Preparation Batch: BJK0307

Sample Size: 10 mL

Prepared: 11/11/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	98.2	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	103	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	103	%	



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Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-66-20211011

21K0213-07 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/10/2021 13:30

Instrument: NT16 Analyst: KOTT

Analyzed: 11/15/2021 21:42

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-07 K

Preparation Batch: BJK0398

Sample Size: 10 mL

Prepared: 11/15/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	98.3	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	94.6	%	


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 Project Manager: Meg Strong

Reported:
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MW-66-20211011
21K0213-07 (Water)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/10/2021 13:30

Instrument: NT11 Analyst: VTS

Analyzed: 11/19/2021 19:00

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0333
 Prepared: 11/15/2021

 Sample Size: 500 mL
 Final Volume: 0.5 mL

Extract ID: 21K0213-07 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.002	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.001	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.001	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.001	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	0.001	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	0.001	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	79.7	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	75.9	%	
Surrogate: Fluoranthene-d10				57-120 %	101	%	



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Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-66-20211011

21K0213-07 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/10/2021 13:30

Instrument: FID4 Analyst: TWC

Analyzed: 11/19/2021 21:37

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0213-07 D 01

Preparation Batch: BJK0309

Sample Size: 500 mL

Prepared: 11/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>113</i>	<i>%</i>	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
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Reported:
 01-Dec-2021 18:16

MW-66-20211011
21K0213-07 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/10/2021 13:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 02:46

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0320 Prepared: 11/12/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0213-07 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0178 Cleaned: 16-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0213-07 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0176 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0213-07 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0177 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0213-07 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	68.8	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	65.5	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	67.4	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	59.1	%	


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

MW-66-20211011
21K0213-07 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/10/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:31

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-07 C 01

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	3.12	ug/L	
Chromium	7440-47-3	2	0.520	1.00	ND	ug/L	U
Iron	7439-89-6	2	36.4	72.0	13100	ug/L	D
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	2	0.284	1.00	508	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	2	0.111	0.400	1.88	ug/L	D


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

MW-66-20211011
21K0213-07 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:31

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-07 C 01

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	3.06	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	1.28	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.472	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	2.16	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-66-20211011

21K0213-07 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/10/2021 13:30

Instrument: HYDRA Analyst: ML

Analyzed: 11/12/2021 15:17

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0213-07 C

Preparation Batch: BJK0287

Sample Size: 20 mL

Prepared: 11/11/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J



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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-66-20211011

21K0213-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/10/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0213-08 A 03

Preparation Batch: BJK0585

Sample Size: 25 mL

Filtration Batch: BJK0299

Prepared: 11/22/2021

Final Volume: 25 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium, Dissolved	7440-39-3	1	0.114	0.500	1.72	ug/L	
Chromium, Dissolved	7440-47-3	2	0.520	1.00	ND	ug/L	U
Iron, Dissolved	7439-89-6	2	36.4	72.0	12100	ug/L	D
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	2	0.284	1.00	507	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	2	0.111	0.400	0.154	ug/L	J, D



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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-66-20211011

21K0213-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 13:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0213-08 A 03

Preparation Batch: BJK0585

Sample Size: 25 mL

Filtration Batch: BJK0299

Prepared: 11/22/2021

Final Volume: 25 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	1.91	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	1.08	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	1.85	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

MW-66-20211011

21K0213-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/10/2021 13:30

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:49

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0213-08 A 01

Preparation Batch: BJK0413

Sample Size: 20 mL

Filtration Batch: BJK0299

Prepared: 11/16/2021

Final Volume: 20 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011 21K0213-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/10/2021 13:51

Instrument: NT3 Analyst: PKC

Analyzed: 11/12/2021 15:50

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-09 N

Preparation Batch: BJK0341

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.08	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4					80-129 %	101	%
Surrogate: Toluene-d8					80-120 %	106	%
Surrogate: 4-Bromofluorobenzene					80-120 %	102	%
Surrogate: 1,2-Dichlorobenzene-d4					80-120 %	99.4	%



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Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/10/2021 13:51

Instrument: NT3 Analyst: PKC

Analyzed: 11/12/2021 15:50

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-09 N

Preparation Batch: BJK0341

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	106	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	102	%	



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Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/10/2021 13:51

Instrument: NT16 Analyst: KOTT

Analyzed: 11/15/2021 22:04

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-09 J

Preparation Batch: BJK0398

Sample Size: 10 mL

Prepared: 11/15/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.3	%	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011 21K0213-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/10/2021 13:51

Instrument: NT10 Analyst: VTS

Analyzed: 11/24/2021 18:24

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJK0334
Prepared: 11/16/2021

Sample Size: 1000 mL
Final Volume: 1 mL

Extract ID: 21K0213-09 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U

Surrogate: 2-Fluorophenol

30-160 % 41.9 %

Surrogate: Phenol-d5

30-160 % 26.0 % *

Surrogate: 2-Chlorophenol-d4

30-160 % 80.7 %

Surrogate: 1,2-Dichlorobenzene-d4

30-160 % 46.8 %

Surrogate: Nitrobenzene-d5

30-160 % 75.7 %

Surrogate: 2-Fluorobiphenyl

30-160 % 72.4 %

Surrogate: 2,4,6-Tribromophenol

30-160 % 94.3 %

Surrogate: p-Terphenyl-d14

30-160 % 109 % Q


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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EB-1-20211011
21K0213-09 (Water)
Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/10/2021 13:51

Instrument: NT11 Analyst: VTS

Analyzed: 11/19/2021 19:30

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0333
 Prepared: 11/15/2021

 Sample Size: 500 mL
 Final Volume: 0.5 mL

Extract ID: 21K0213-09 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.002	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzofluoranthenes, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	74.7	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	72.6	%	
Surrogate: Fluoranthene-d10				57-120 %	94.0	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)

Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/10/2021 13:51

Instrument: FID4 Analyst: TWC

Analyzed: 11/19/2021 21:56

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0213-09 D 01

Preparation Batch: BJK0309

Sample Size: 500 mL

Prepared: 11/15/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>111</i>	<i>%</i>	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/10/2021 13:51

Instrument: ECD7 Analyst: JGR

Analyzed: 11/17/2021 03:07

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0320 Prepared: 11/12/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0213-09 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0178 Cleaned: 16-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0213-09 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0176 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0213-09 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0177 Cleaned: 16-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0213-09 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	59.6	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	69.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	59.4	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	64.5	%	



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Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/10/2021 13:51

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 16:59

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BJK0507 Sample Size: 25 mL
Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-09 C 01

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	ND	ug/L	U
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	1	0.142	0.500	ND	ug/L	U
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 13:51

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 00:54

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0213-09 C 01

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	ND	ug/L	U
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel	7440-02-0	1	0.0792	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-09 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/10/2021 13:51

Instrument: HYDRA Analyst: ML

Analyzed: 11/12/2021 15:33

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0213-09 C

Preparation Batch: BJK0287

Sample Size: 20 mL

Prepared: 11/11/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

EB-1-20211011
21K0213-10 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/10/2021 13:51

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:41

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0585 Sample Size: 25 mL
 Prepared: 11/22/2021 Final Volume: 25 mL

 Extract ID: 21K0213-10 A 03
 Filtration Batch: BJK0299
 Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium, Dissolved	7440-39-3	1	0.114	0.500	ND	ug/L	U
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	ND	ug/L	U
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	1	0.142	0.500	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	ND	ug/L	U



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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/10/2021 13:51

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 21:41

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0213-10 A 03
	Preparation Batch: BJK0585	Filtration Batch: BJK0299
	Sample Size: 25 mL	
	Prepared: 11/22/2021	Final Volume: 25 mL
		Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	ND	ug/L	U
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	ND	ug/L	U
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

EB-1-20211011
21K0213-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/10/2021 13:51

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 15:03

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0213-10 A 01

Preparation Batch: BJK0413

Sample Size: 20 mL

Filtration Batch: BJK0299

Prepared: 11/16/2021

Final Volume: 20 mL

Filtration Date: 11/11/2021 13:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000031	mg/L	J



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

TB-2-20211011
21K0213-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/10/2021 12:45

Instrument: NT3 Analyst: PKC

Analyzed: 11/11/2021 18:07

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BJK0307
Prepared: 11/11/2021

Sample Size: 10 mL
Final Volume: 10 mL

Extract ID: 21K0213-11 A

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4					80-129 %	98.6 %	
Surrogate: Toluene-d8					80-120 %	103 %	
Surrogate: 4-Bromofluorobenzene					80-120 %	105 %	
Surrogate: 1,2-Dichlorobenzene-d4					80-120 %	99.3 %	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

TB-2-20211011
21K0213-11 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/10/2021 12:45

Instrument: NT16 Analyst: KOTT

Analyzed: 11/15/2021 21:00

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0213-11 B

Preparation Batch: BJK0398

Sample Size: 10 mL

Prepared: 11/15/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.1	%	



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0307 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0307-BLK1)											
						Prepared: 11-Nov-2021		Analyzed: 11-Nov-2021 16:51			
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.95			ug/L	5.00		99.0	80-129			
<i>Surrogate: Toluene-d8</i>	5.18			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.25			ug/L	5.00		105	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.18			ug/L	5.00		104	80-120			
LCS (BJK0307-BS1)											
						Prepared: 11-Nov-2021		Analyzed: 11-Nov-2021 14:55			
Vinyl Chloride	9.01	0.08	0.20	ug/L	10.0		90.1	66-133			
1,1-Dichloroethene	8.47	0.08	0.20	ug/L	10.0		84.7	69-135			
trans-1,2-Dichloroethene	8.68	0.07	0.20	ug/L	10.0		86.8	78-128			
cis-1,2-Dichloroethene	9.22	0.08	0.20	ug/L	10.0		92.2	80-121			
Benzene	9.56	0.05	0.20	ug/L	10.0		95.6	80-120			
Trichloroethene	9.74	0.07	0.20	ug/L	10.0		97.4	80-120			
Toluene	9.95	0.05	0.20	ug/L	10.0		99.5	80-120			
Tetrachloroethene	10.4	0.09	0.20	ug/L	10.0		104	80-120			
Ethylbenzene	10.0	0.05	0.20	ug/L	10.0		100	80-120			
m,p-Xylene	20.2	0.14	0.40	ug/L	20.0		101	80-121			
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Xylenes, total	30.2	0.22	0.60	ug/L	30.0		101	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.64			ug/L	5.00		92.8	80-129			
<i>Surrogate: Toluene-d8</i>	5.20			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.60			ug/L	5.00		112	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.81			ug/L	5.00		96.3	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0307 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0307-BSD1)						Prepared: 11-Nov-2021	Analyzed: 11-Nov-2021 16:01				
Vinyl Chloride	9.43	0.08	0.20	ug/L	10.0		94.3	66-133	4.51	30	
1,1-Dichloroethene	9.10	0.08	0.20	ug/L	10.0		91.0	69-135	7.15	30	
trans-1,2-Dichloroethene	9.04	0.07	0.20	ug/L	10.0		90.4	78-128	4.03	30	
cis-1,2-Dichloroethene	10.0	0.08	0.20	ug/L	10.0		100	80-121	8.52	30	
Benzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	5.56	30	
Trichloroethene	9.98	0.07	0.20	ug/L	10.0		99.8	80-120	2.46	30	
Toluene	10.2	0.05	0.20	ug/L	10.0		102	80-120	2.89	30	
Tetrachloroethene	10.6	0.09	0.20	ug/L	10.0		106	80-120	2.00	30	
Ethylbenzene	10.2	0.05	0.20	ug/L	10.0		102	80-120	2.00	30	
m,p-Xylene	21.2	0.14	0.40	ug/L	20.0		106	80-121	5.16	30	
o-Xylene	10.2	0.08	0.20	ug/L	10.0		102	80-121	1.86	30	
Xylenes, total	31.5	0.22	0.60	ug/L	30.0		105	76-127	4.08	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.82			ug/L	5.00		96.3	80-129			
<i>Surrogate: Toluene-d8</i>	5.18			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.11			ug/L	5.00		102	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.78			ug/L	5.00		95.7	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0341 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0341-BLK1)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 15:24								
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.24		ug/L	5.00		105	80-120			
Blank (BJK0341-BLK2)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 15:24								
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	5.06		ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	5.10		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.24		ug/L	5.00		105	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.91		ug/L	5.00		98.2	80-120			
LCS (BJK0341-BS1)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 13:18								
Gasoline Range Organics (Tol-Nap)	988	100	ug/L	1000		98.8	72-128			
Surrogate: Toluene-d8	5.28		ug/L	5.00		106	80-120			
Surrogate: 4-Bromofluorobenzene	5.23		ug/L	5.00		105	80-120			
LCS (BJK0341-BS2)		Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 13:44								
Vinyl Chloride	9.88	0.08	0.20	ug/L	10.0	98.8	66-133			
1,1-Dichloroethene	9.03	0.08	0.20	ug/L	10.0	90.3	69-135			
trans-1,2-Dichloroethene	9.46	0.07	0.20	ug/L	10.0	94.6	78-128			
cis-1,2-Dichloroethene	9.83	0.08	0.20	ug/L	10.0	98.3	80-121			
Benzene	10.6	0.05	0.20	ug/L	10.0	106	80-120			
Trichloroethene	10.2	0.07	0.20	ug/L	10.0	102	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0341 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0341-BS2)						Prepared: 12-Nov-2021	Analyzed: 12-Nov-2021 13:44				
Toluene	10.8	0.05	0.20	ug/L	10.0		108	80-120			
Tetrachloroethene	10.9	0.09	0.20	ug/L	10.0		109	80-120			
Ethylbenzene	10.3	0.05	0.20	ug/L	10.0		103	80-120			
m,p-Xylene	21.3	0.14	0.40	ug/L	20.0		107	80-121			
o-Xylene	10.7	0.08	0.20	ug/L	10.0		107	80-121			
Xylenes, total	32.0	0.22	0.60	ug/L	30.0		107	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.74			ug/L	5.00		94.9	80-129			
<i>Surrogate: Toluene-d8</i>	5.31			ug/L	5.00		106	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.04			ug/L	5.00		101	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.77			ug/L	5.00		95.4	80-120			
LCS Dup (BJK0341-BSD1)						Prepared: 12-Nov-2021	Analyzed: 12-Nov-2021 14:09				
Gasoline Range Organics (Tol-Nap)	847		100	ug/L	1000		84.7	72-128	15.40	30	
<i>Surrogate: Toluene-d8</i>	5.20			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.21			ug/L	5.00		104	80-120			
LCS Dup (BJK0341-BSD2)						Prepared: 12-Nov-2021	Analyzed: 12-Nov-2021 14:34				
Vinyl Chloride	9.20	0.08	0.20	ug/L	10.0		92.0	66-133	7.07	30	
1,1-Dichloroethene	8.84	0.08	0.20	ug/L	10.0		88.4	69-135	2.10	30	
trans-1,2-Dichloroethene	8.68	0.07	0.20	ug/L	10.0		86.8	78-128	8.63	30	
cis-1,2-Dichloroethene	9.09	0.08	0.20	ug/L	10.0		90.9	80-121	7.81	30	
Benzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	5.46	30	
Trichloroethene	9.90	0.07	0.20	ug/L	10.0		99.0	80-120	2.93	30	
Toluene	10.1	0.05	0.20	ug/L	10.0		101	80-120	6.59	30	
Tetrachloroethene	10.7	0.09	0.20	ug/L	10.0		107	80-120	1.70	30	
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	1.34	30	
m,p-Xylene	20.5	0.14	0.40	ug/L	20.0		103	80-121	3.78	30	
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121	5.05	30	
Xylenes, total	30.7	0.22	0.60	ug/L	30.0		102	76-127	4.20	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.84			ug/L	5.00		96.9	80-129			
<i>Surrogate: Toluene-d8</i>	5.14			ug/L	5.00		103	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.55			ug/L	5.00		111	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.83			ug/L	5.00		96.6	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0477 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0477-BLK1)		Prepared: 18-Nov-2021 Analyzed: 18-Nov-2021 14:16								
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	5.07		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.36		ug/L	5.00		107	80-120			
Blank (BJK0477-BLK2)		Prepared: 18-Nov-2021 Analyzed: 18-Nov-2021 14:16								
Benzene	ND	0.05	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Surrogate: Toluene-d8	5.07		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.36		ug/L	5.00		107	80-120			
LCS (BJK0477-BS1)		Prepared: 18-Nov-2021 Analyzed: 18-Nov-2021 12:10								
Gasoline Range Organics (Tol-Nap)	971	100	ug/L	1000		97.1	72-128			
Surrogate: Toluene-d8	5.49		ug/L	5.00		110	80-120			
Surrogate: 4-Bromofluorobenzene	5.38		ug/L	5.00		108	80-120			
LCS (BJK0477-BS2)		Prepared: 18-Nov-2021 Analyzed: 18-Nov-2021 12:35								
Benzene	10.7	0.05	0.20	ug/L	10.0	107	80-120			
Toluene	10.8	0.05	0.20	ug/L	10.0	108	80-120			
Ethylbenzene	10.7	0.05	0.20	ug/L	10.0	107	80-120			
m,p-Xylene	21.3	0.14	0.40	ug/L	20.0	106	80-121			
o-Xylene	10.5	0.08	0.20	ug/L	10.0	105	80-121			
Xylenes, total	31.8	0.22	0.60	ug/L	30.0	106	76-127			
Surrogate: Toluene-d8	5.30		ug/L	5.00		106	80-120			
Surrogate: 4-Bromofluorobenzene	5.19		ug/L	5.00		104	80-120			
LCS Dup (BJK0477-BSD1)		Prepared: 18-Nov-2021 Analyzed: 18-Nov-2021 13:01								
Gasoline Range Organics (Tol-Nap)	911	100	ug/L	1000		91.1	72-128	6.35	30	
Surrogate: Toluene-d8	5.45		ug/L	5.00		109	80-120			
Surrogate: 4-Bromofluorobenzene	5.50		ug/L	5.00		110	80-120			



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0477 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0477-BSD2)						Prepared: 18-Nov-2021 Analyzed: 18-Nov-2021 13:26					
Benzene	10.9	0.05	0.20	ug/L	10.0		109	80-120	1.06	30	
Toluene	10.8	0.05	0.20	ug/L	10.0		108	80-120	0.42	30	
Ethylbenzene	10.2	0.05	0.20	ug/L	10.0		102	80-120	4.62	30	
m,p-Xylene	20.8	0.14	0.40	ug/L	20.0		104	80-121	2.42	30	
o-Xylene	10.3	0.08	0.20	ug/L	10.0		103	80-121	1.42	30	
Xylenes, total	31.1	0.22	0.60	ug/L	30.0		104	76-127	2.09	30	
<i>Surrogate: Toluene-d8</i>	5.38			ug/L	5.00		108	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.30			ug/L	5.00		106	80-120			


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - SIM - Quality Control
Batch BJK0398 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0398-BLK1)					Prepared: 15-Nov-2021 Analyzed: 15-Nov-2021 15:23						
Vinyl chloride	ND	5.01	20.0	ng/L							U
Surrogate: 1,2-Dichloroethane-d4	5090			ng/L	5000		102	80-129			
Surrogate: Toluene-d8	5190			ng/L	5000		104	80-120			
Surrogate: 4-Bromofluorobenzene	4910			ng/L	5000		98.3	75-125			
LCS (BJK0398-BS1)					Prepared: 15-Nov-2021 Analyzed: 15-Nov-2021 13:07						
Vinyl chloride	2230	5.01	20.0	ng/L	2000		112	62-141			
Surrogate: 1,2-Dichloroethane-d4	5890			ng/L	5000		118	80-129			
Surrogate: Toluene-d8	5360			ng/L	5000		107	80-120			
Surrogate: 4-Bromofluorobenzene	5280			ng/L	5000		106	75-125			
LCS Dup (BJK0398-BS1)					Prepared: 15-Nov-2021 Analyzed: 15-Nov-2021 14:01						
Vinyl chloride	2370	5.01	20.0	ng/L	2000		118	62-141	5.86	30	
Surrogate: 1,2-Dichloroethane-d4	5400			ng/L	5000		108	80-129			
Surrogate: Toluene-d8	5340			ng/L	5000		107	80-120			
Surrogate: 4-Bromofluorobenzene	5230			ng/L	5000		105	75-125			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BJK0334 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0334-BLK1)						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 15:52					
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
<i>Surrogate: 2-Fluorophenol</i>	3.70			ug/L	7.50		49.3	30-160			
<i>Surrogate: Phenol-d5</i>	2.41			ug/L	7.50		32.2	30-160			
<i>Surrogate: 2-Chlorophenol-d4</i>	6.64			ug/L	7.50		88.6	30-160			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.61			ug/L	5.00		52.2	30-160			
<i>Surrogate: Nitrobenzene-d5</i>	4.08			ug/L	5.00		81.6	30-160			
<i>Surrogate: 2-Fluorobiphenyl</i>	3.96			ug/L	5.00		79.2	30-160			
<i>Surrogate: 2,4,6-Tribromophenol</i>	7.78			ug/L	7.50		104	30-160			
<i>Surrogate: p-Terphenyl-d14</i>	7.54			ug/L	5.00		151	30-160			Q
LCS (BJK0334-BS1)						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 16:30					
1,4-Dichlorobenzene	2.1	0.03	0.2	ug/L	5.00		41.3	30-160			
1,2-Dichlorobenzene	1.9	0.03	0.2	ug/L	5.00		38.2	30-160			
2,4-Dimethylphenol	10.1	0.3	1.0	ug/L	13.0		77.7	30-160			
Benzoic acid	8.7	0.1	2.0	ug/L	23.0		37.7	30-160			
N-Nitrosodiphenylamine	4.4	0.03	0.2	ug/L	5.00		87.1	30-160			
Pentachlorophenol	5.3	0.1	1.0	ug/L	13.0		40.6	30-160			Q
Di-n-Butylphthalate	4.9	0.05	0.2	ug/L	5.00		97.5	30-160			
Butylbenzylphthalate	6.0	0.07	0.2	ug/L	5.00		120	30-160			Q
bis(2-Ethylhexyl)phthalate	5.4	0.2	0.2	ug/L	5.00		108	30-160			Q
<i>Surrogate: 2-Fluorophenol</i>	3.80			ug/L	7.50		50.7	30-160			
<i>Surrogate: Phenol-d5</i>	2.60			ug/L	7.50		34.7	30-160			
<i>Surrogate: 2-Chlorophenol-d4</i>	5.82			ug/L	7.50		77.6	30-160			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	1.92			ug/L	5.00		38.4	30-160			
<i>Surrogate: Nitrobenzene-d5</i>	4.00			ug/L	5.00		80.0	30-160			
<i>Surrogate: 2-Fluorobiphenyl</i>	3.30			ug/L	5.00		66.0	30-160			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BJK0334 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0334-BS1)						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 16:30					
Surrogate: 2,4,6-Tribromophenol	7.14			ug/L	7.50		95.3	30-160			
Surrogate: p-Terphenyl-d14	6.69			ug/L	5.00		134	30-160			Q
LCS Dup (BJK0334-BSD1)						Prepared: 16-Nov-2021 Analyzed: 24-Nov-2021 17:08					
1,4-Dichlorobenzene	2.4	0.03	0.2	ug/L	5.00		48.3	30-160	15.60	30	
1,2-Dichlorobenzene	2.2	0.03	0.2	ug/L	5.00		44.2	30-160	14.50	30	
2,4-Dimethylphenol	10.8	0.3	1.0	ug/L	13.0		83.2	30-160	6.74	30	
Benzoic acid	9.0	0.1	2.0	ug/L	23.0		39.1	30-160	3.79	30	
N-Nitrosodiphenylamine	4.7	0.03	0.2	ug/L	5.00		93.2	30-160	6.74	30	
Pentachlorophenol	5.5	0.1	1.0	ug/L	13.0		42.1	30-160	3.73	30	Q
Di-n-Butylphthalate	5.3	0.05	0.2	ug/L	5.00		106	30-160	8.15	30	
Butylbenzylphthalate	6.4	0.07	0.2	ug/L	5.00		129	30-160	7.32	30	Q
bis(2-Ethylhexyl)phthalate	5.9	0.2	0.2	ug/L	5.00		118	30-160	9.31	30	Q
Surrogate: 2-Fluorophenol	4.14			ug/L	7.50		55.2	30-160			
Surrogate: Phenol-d5	2.89			ug/L	7.50		38.6	30-160			
Surrogate: 2-Chlorophenol-d4	6.33			ug/L	7.50		84.4	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	2.30			ug/L	5.00		45.9	30-160			
Surrogate: Nitrobenzene-d5	4.32			ug/L	5.00		86.4	30-160			
Surrogate: 2-Fluorobiphenyl	3.51			ug/L	5.00		70.3	30-160			
Surrogate: 2,4,6-Tribromophenol	7.58			ug/L	7.50		101	30-160			
Surrogate: p-Terphenyl-d14	6.71			ug/L	5.00		134	30-160			Q



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJK0333 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0333-BLK1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 16:30					
Naphthalene	0.001	0.001	0.010	ug/L							J
2-Methylnaphthalene	ND	0.001	0.010	ug/L							U
1-Methylnaphthalene	ND	0.0009	0.010	ug/L							U
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	0.002	0.002	0.010	ug/L							J
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	0.004	0.001	0.010	ug/L							J
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	0.001	0.001	0.010	ug/L							J
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.200			ug/L	0.300		66.7	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.191			ug/L	0.300		63.8	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.238			ug/L	0.300		79.3	57-120			
LCS (BJK0333-BS1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 17:00					
Naphthalene	0.207	0.001	0.010	ug/L	0.300		68.9	37-120			
2-Methylnaphthalene	0.230	0.001	0.010	ug/L	0.300		76.6	37-120			
1-Methylnaphthalene	0.229	0.0009	0.010	ug/L	0.300		76.5	29-120			
Acenaphthylene	0.247	0.002	0.010	ug/L	0.300		82.5	41-120			
Acenaphthene	0.249	0.003	0.010	ug/L	0.300		83.0	41-120			
Dibenzofuran	0.235	0.002	0.010	ug/L	0.300		78.4	38-120			
Fluorene	0.255	0.002	0.010	ug/L	0.300		85.1	43-120			


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Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0333 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0333-BS1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 17:00					
Phenanthrene	0.252	0.001	0.010	ug/L	0.300		83.9	41-120			
Anthracene	0.253	0.001	0.010	ug/L	0.300		84.4	40-120			
Carbazole	0.266	0.001	0.010	ug/L	0.300		88.7	30-160			
Fluoranthene	0.262	0.002	0.010	ug/L	0.300		87.4	45-120			
Pyrene	0.264	0.001	0.010	ug/L	0.300		88.1	41-120			
Benzo(a)anthracene	0.269	0.0008	0.010	ug/L	0.300		89.6	42-120			
Chrysene	0.250	0.0009	0.010	ug/L	0.300		83.3	44-120			
Benzo(b)fluoranthene	0.267	0.0005	0.010	ug/L	0.300		88.9	44-120			
Benzo(k)fluoranthene	0.252	0.003	0.010	ug/L	0.300		84.2	50-120			
Benzo(j)fluoranthene	0.241	0.002	0.010	ug/L	0.300		80.4	39-160			
Benzofluoranthenes, Total	0.760	0.004	0.010	ug/L	0.900		84.5	46-120			
Benzo(a)pyrene	0.247	0.002	0.010	ug/L	0.300		82.3	35-120			
Perylene	0.233	0.006	0.010	ug/L	0.300		77.7	30-160			
Indeno(1,2,3-cd)pyrene	0.245	0.001	0.010	ug/L	0.300		81.8	37-120			
Dibenzo(a,h)anthracene	0.241	0.001	0.010	ug/L	0.300		80.3	34-120			
Benzo(g,h,i)perylene	0.203	0.001	0.010	ug/L	0.300		67.6	38-120			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.249			ug/L	0.300		82.9	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.240			ug/L	0.300		80.0	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.291			ug/L	0.300		97.0	57-120			
LCS Dup (BJK0333-BSD1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 17:30					
Naphthalene	0.223	0.001	0.010	ug/L	0.300		74.5	37-120	7.83	30	
2-Methylnaphthalene	0.245	0.001	0.010	ug/L	0.300		81.5	37-120	6.20	30	
1-Methylnaphthalene	0.243	0.0009	0.010	ug/L	0.300		80.9	29-120	5.68	30	
Acenaphthylene	0.260	0.002	0.010	ug/L	0.300		86.6	41-120	4.84	30	
Acenaphthene	0.260	0.003	0.010	ug/L	0.300		86.8	41-120	4.46	30	
Dibenzofuran	0.245	0.002	0.010	ug/L	0.300		81.8	38-120	4.27	30	
Fluorene	0.261	0.002	0.010	ug/L	0.300		87.2	43-120	2.33	30	
Phenanthrene	0.259	0.001	0.010	ug/L	0.300		86.2	41-120	2.65	30	
Anthracene	0.262	0.001	0.010	ug/L	0.300		87.4	40-120	3.58	30	
Carbazole	0.271	0.001	0.010	ug/L	0.300		90.2	30-160	1.66	30	
Fluoranthene	0.272	0.002	0.010	ug/L	0.300		90.7	45-120	3.67	30	
Pyrene	0.265	0.001	0.010	ug/L	0.300		88.3	41-120	0.23	30	
Benzo(a)anthracene	0.273	0.0008	0.010	ug/L	0.300		90.8	42-120	1.36	30	
Chrysene	0.257	0.0009	0.010	ug/L	0.300		85.5	44-120	2.58	30	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0333 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0333-BSD1)						Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 17:30					
Benzo(b)fluoranthene	0.265	0.0005	0.010	ug/L	0.300		88.2	44-120	0.81	30	
Benzo(k)fluoranthene	0.257	0.003	0.010	ug/L	0.300		85.5	50-120	1.64	30	
Benzo(j)fluoranthene	0.248	0.002	0.010	ug/L	0.300		82.8	39-160	3.00	30	
Benzofluoranthenes, Total	0.770	0.004	0.010	ug/L	0.900		85.5	46-120	1.23	30	
Benzo(a)pyrene	0.251	0.002	0.010	ug/L	0.300		83.7	35-120	1.60	30	
Perylene	0.238	0.006	0.010	ug/L	0.300		79.2	30-160	1.85	30	
Indeno(1,2,3-cd)pyrene	0.245	0.001	0.010	ug/L	0.300		81.7	37-120	0.13	30	
Dibenzo(a,h)anthracene	0.240	0.001	0.010	ug/L	0.300		80.0	34-120	0.38	30	
Benzo(g,h,i)perylene	0.202	0.001	0.010	ug/L	0.300		67.4	38-120	0.32	30	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	0.255			ug/L	0.300		85.1	42-120			
<i>Surrogate: Dibenzo[a,h]anthracene-d14</i>	0.230			ug/L	0.300		76.7	29-120			
<i>Surrogate: Fluoranthene-d10</i>	0.284			ug/L	0.300		94.6	57-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJK0309 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0309-BLK1)		Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 19:21								
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
<i>Surrogate: o-Terphenyl</i>	0.279		mg/L	0.225	124		50-150			
LCS (BJK0309-BS1)		Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 19:41								
Diesel Range Organics (C12-C24)	2.59	0.100	mg/L	3.00		86.4	56-120			
<i>Surrogate: o-Terphenyl</i>	0.224		mg/L	0.225	99.6		50-150			
LCS Dup (BJK0309-BSD1)		Prepared: 15-Nov-2021 Analyzed: 19-Nov-2021 20:00								
Diesel Range Organics (C12-C24)	2.66	0.100	mg/L	3.00		88.7	56-120	2.60	30	
<i>Surrogate: o-Terphenyl</i>	0.231		mg/L	0.225	102		50-150			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJK0320 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0320-BLK1)					Prepared: 12-Nov-2021 Analyzed: 16-Nov-2021 22:06						
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0150			ug/L	0.0200		75.2	29-120			
Surrogate: Tetrachlorometaxylene	0.0142			ug/L	0.0200		71.0	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0130			ug/L	0.0200		64.8	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0131			ug/L	0.0200		65.5	32-120			
LCS (BJK0320-BS1)					Prepared: 12-Nov-2021 Analyzed: 16-Nov-2021 22:28						
Aroclor 1016 [2C]	0.042	0.002	0.010	ug/L	0.0500		83.7	54-120			
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		81.9	51-128			
Surrogate: Decachlorobiphenyl	0.0147			ug/L	0.0200		73.6	29-120			
Surrogate: Tetrachlorometaxylene	0.0128			ug/L	0.0200		64.2	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0139			ug/L	0.0200		69.4	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0119			ug/L	0.0200		59.4	32-120			
LCS Dup (BJK0320-BSD1)					Prepared: 12-Nov-2021 Analyzed: 16-Nov-2021 22:49						
Aroclor 1016 [2C]	0.045	0.002	0.010	ug/L	0.0500		89.5	54-120	6.73	30	
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		82.6	51-128	0.79	30	
Surrogate: Decachlorobiphenyl	0.0146			ug/L	0.0200		72.8	29-120			
Surrogate: Tetrachlorometaxylene	0.0138			ug/L	0.0200		68.8	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0138			ug/L	0.0200		69.2	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0127			ug/L	0.0200		63.6	32-120			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0287 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0287-BLK1)						Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:08				
Mercury	0.000026	0.000013	0.000100	mg/L							J
LCS (BJK0287-BS1)						Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:15				
Mercury	0.00167	0.000013	0.000100	mg/L	0.00200		83.4	80-120			
Duplicate (BJK0287-DUP1)						Source: 21K0213-07	Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:20			
Mercury	0.000026	0.000013	0.000100	mg/L		0.000026			0.39	20	J
Matrix Spike (BJK0287-MS1)						Source: 21K0213-07	Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:22			
Mercury	0.000838	0.000013	0.000100	mg/L	0.00100	0.000026	81.2	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJK0287-MSD1)						Source: 21K0213-07	Prepared: 11-Nov-2021	Analyzed: 12-Nov-2021 15:24			
Mercury	0.000856	0.000013	0.000100	mg/L	0.00100	0.000026	83.0	75-125	2.14	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0507 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0507-BLK1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 00:47						
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U
Blank (BJK0507-BLK2)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 16:49						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Manganese	55	ND	0.142	0.500	ug/L							U
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Blank (BJK0507-BLK3)						Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 15:54						
Selenium	78	ND	0.179	0.500	ug/L							U
LCS (BJK0507-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 00:51						
Arsenic	75a	25.3	0.0373	0.200	ug/L	25.0		101	80-120			
Copper	63	26.7	0.173	0.500	ug/L	25.0		107	80-120			
Copper	65	27.0	0.350	0.500	ug/L	25.0		108	80-120			
Zinc	66	84.7	2.92	6.00	ug/L	80.0		106	80-120			
Zinc	67	80.6	0.940	6.00	ug/L	80.0		101	80-120			
LCS (BJK0507-BS2)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 16:53						
Barium	135	26.0	0.114	0.500	ug/L	25.0		104	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BJK0507 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0507-BS2)			Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 16:53									
Barium	137	25.9	0.0765	0.500	ug/L	25.0		103	80-120			
Chromium	52	26.0	0.260	0.500	ug/L	25.0		104	80-120			
Chromium	53	26.2	0.239	0.500	ug/L	25.0		105	80-120			
Iron	54	5160	18.2	36.0	ug/L	5000		103	80-120			
Iron	57	5250	6.63	36.0	ug/L	5000		105	80-120			
Lead	208	25.4	0.0513	0.100	ug/L	25.0		102	80-120			
Manganese	55	25.9	0.142	0.500	ug/L	25.0		104	80-120			
Silver	107	25.6	0.0220	0.200	ug/L	25.0		103	80-120			
Vanadium	51a	25.8	0.0556	0.200	ug/L	25.0		103	80-120			
Vanadium	51b	25.9	0.0521	0.200	ug/L	25.0		103	80-120			
Cadmium	111	25.3	0.0300	0.100	ug/L	25.0		101	80-120			
Cadmium	114	24.6	0.0400	0.100	ug/L	25.0		98.6	80-120			
Cobalt	59	25.7	0.0178	0.200	ug/L	25.0		103	80-120			
Nickel	60	26.1	0.0792	0.500	ug/L	25.0		105	80-120			
Nickel	62	26.3	0.220	0.500	ug/L	25.0		105	80-120			
Duplicate (BJK0507-DUP1)			Source: 21K0213-09		Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 00:57							
Arsenic	75a	ND	0.0373	0.200	ug/L		ND					U
Copper	63	0.305	0.173	0.500	ug/L		ND					J
Zinc	66	ND	2.92	6.00	ug/L		ND					U
Duplicate (BJK0507-DUP2)			Source: 21K0213-09		Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 17:05							
Barium	135	ND	0.114	0.500	ug/L		ND					U
Chromium	52	ND	0.260	0.500	ug/L		ND					U
Iron	54	ND	18.2	36.0	ug/L		ND					U
Lead	208	ND	0.0513	0.100	ug/L		ND					U
Manganese	55	ND	0.142	0.500	ug/L		ND					U
Silver	107	ND	0.0220	0.200	ug/L		ND					U
Vanadium	51a	ND	0.0556	0.200	ug/L		ND					U
Cadmium	111	ND	0.0300	0.100	ug/L		ND					U
Cobalt	59	ND	0.0178	0.200	ug/L		ND					U
Nickel	60	ND	0.0792	0.500	ug/L		ND					U
Matrix Spike (BJK0507-MS1)			Source: 21K0213-09		Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 00:59							
Arsenic	75a	25.8	0.0373	0.200	ug/L	25.0	ND	103	75-125			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BJK0507 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJK0507-MS1)		Source: 21K0213-09		Prepared: 18-Nov-2021		Analyzed: 23-Nov-2021 00:59						
Copper	63	28.8	0.173	0.500	ug/L	25.0	ND	115	75-125			
Zinc	66	84.1	2.92	6.00	ug/L	80.0	ND	105	75-125			

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

Matrix Spike (BJK0507-MS2)		Source: 21K0213-09		Prepared: 18-Nov-2021		Analyzed: 23-Nov-2021 17:10						
Barium	135	26.3	0.114	0.500	ug/L	25.0	ND	105	75-125			
Chromium	52	26.0	0.260	0.500	ug/L	25.0	ND	104	75-125			
Iron	54	5160	18.2	36.0	ug/L	5000	ND	103	75-125			
Lead	208	25.9	0.0513	0.100	ug/L	25.0	ND	104	75-125			
Manganese	55	25.6	0.142	0.500	ug/L	25.0	ND	102	75-125			
Silver	107	26.6	0.0220	0.200	ug/L	25.0	ND	106	75-125			
Vanadium	51a	25.4	0.0556	0.200	ug/L	25.0	ND	101	75-125			
Cadmium	111	25.6	0.0300	0.100	ug/L	25.0	ND	103	75-125			
Cobalt	59	26.1	0.0178	0.200	ug/L	25.0	ND	104	75-125			
Nickel	60	26.5	0.0792	0.500	ug/L	25.0	ND	106	75-125			

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

Matrix Spike Dup (BJK0507-MSD1)		Source: 21K0213-09		Prepared: 18-Nov-2021		Analyzed: 23-Nov-2021 01:02						
Arsenic	75a	25.8	0.0373	0.200	ug/L	25.0	ND	103	75-125	0.37	20	
Copper	63	28.3	0.173	0.500	ug/L	25.0	ND	113	75-125	1.72	20	
Zinc	66	82.2	2.92	6.00	ug/L	80.0	ND	103	75-125	2.29	20	

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

Matrix Spike Dup (BJK0507-MSD2)		Source: 21K0213-09		Prepared: 18-Nov-2021		Analyzed: 23-Nov-2021 17:15						
Barium	135	26.9	0.114	0.500	ug/L	25.0	ND	108	75-125	2.16	20	
Chromium	52	25.6	0.260	0.500	ug/L	25.0	ND	103	75-125	1.53	20	
Iron	54	5260	18.2	36.0	ug/L	5000	ND	105	75-125	1.90	20	
Lead	208	26.1	0.0513	0.100	ug/L	25.0	ND	104	75-125	0.57	20	
Manganese	55	25.9	0.142	0.500	ug/L	25.0	ND	103	75-125	1.24	20	
Silver	107	26.7	0.0220	0.200	ug/L	25.0	ND	107	75-125	0.38	20	
Vanadium	51a	25.1	0.0556	0.200	ug/L	25.0	ND	100	75-125	0.99	20	
Cadmium	111	25.8	0.0300	0.100	ug/L	25.0	ND	103	75-125	0.62	20	
Cobalt	59	26.1	0.0178	0.200	ug/L	25.0	ND	104	75-125	0.17	20	
Nickel	60	26.3	0.0792	0.500	ug/L	25.0	ND	105	75-125	0.69	20	

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



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BJK0507 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0413 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0413-BLK1)						Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:44					
Mercury, Dissolved	0.000031	0.000013	0.000100	mg/L							J
LCS (BJK0413-BS1)						Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:46					
Mercury, Dissolved	0.00185	0.000013	0.000100	mg/L	0.00200		92.5	80-120			
Duplicate (BJK0413-DUP1)						Source: 21K0213-08 Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:51					
Mercury, Dissolved	0.000033	0.000013	0.000100	mg/L		0.000026			21.60	20	L, J
Matrix Spike (BJK0413-MS1)						Source: 21K0213-08 Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:53					
Mercury, Dissolved	0.000873	0.000013	0.000100	mg/L	0.00100	0.000026	84.7	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJK0413-MSD1)						Source: 21K0213-08 Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:56					
Mercury, Dissolved	0.000883	0.000013	0.000100	mg/L	0.00100	0.000026	85.6	75-125	1.09	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0585 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0585-BLK1)						Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 20:12						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	18.2	36.0	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
LCS (BJK0585-BS1)						Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 20:16						
Barium, Dissolved	135	24.1	0.114	0.500	ug/L	25.0		96.4	80-120			
Barium, Dissolved	137	24.1	0.0765	0.500	ug/L	25.0		96.5	80-120			
Chromium, Dissolved	52	25.0	0.260	0.500	ug/L	25.0		99.8	80-120			
Chromium, Dissolved	53	25.2	0.239	0.500	ug/L	25.0		101	80-120			
Iron, Dissolved	54	5150	18.2	36.0	ug/L	5000		103	80-120			
Iron, Dissolved	57	5210	18.2	36.0	ug/L	5000		104	80-120			
Lead, Dissolved	208	25.2	0.0513	0.100	ug/L	25.0		101	80-120			
Manganese, Dissolved	55	25.1	0.142	0.500	ug/L	25.0		100	80-120			
Silver, Dissolved	107	27.3	0.0220	0.200	ug/L	25.0		109	80-120			
Vanadium, Dissolved	51a	24.7	0.0556	0.200	ug/L	25.0		98.7	80-120			
Vanadium, Dissolved	51b	24.8	0.0521	0.200	ug/L	25.0		99.1	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 01-Dec-2021 18:16

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0585 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0585-BS1)						Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 20:16						
Arsenic, Dissolved	75a	24.7	0.0373	0.200	ug/L	25.0		98.7	80-120			
Cadmium, Dissolved	111	25.1	0.0300	0.100	ug/L	25.0		100	80-120			
Cadmium, Dissolved	114	25.0	0.0400	0.100	ug/L	25.0		99.8	80-120			
Cobalt, Dissolved	59	25.8	0.0178	0.200	ug/L	25.0		103	80-120			
Copper, Dissolved	63	26.2	0.173	0.500	ug/L	25.0		105	80-120			
Copper, Dissolved	65	25.6	0.350	0.500	ug/L	25.0		102	80-120			
Nickel, Dissolved	60	25.9	0.0792	0.500	ug/L	25.0		104	80-120			
Nickel, Dissolved	62	25.9	0.220	0.500	ug/L	25.0		104	80-120			
Selenium, Dissolved	78	74.1	0.179	0.500	ug/L	80.0		92.6	80-120			
Zinc, Dissolved	66	80.3	2.92	6.00	ug/L	80.0		100	80-120			
Zinc, Dissolved	67	78.3	0.940	6.00	ug/L	80.0		97.9	80-120			
Duplicate (BJK0585-DUP1)						Source: 21K0213-02 Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 20:43						
Barium, Dissolved	135	4.39	0.114	0.500	ug/L		4.66			5.97	20	
Lead, Dissolved	208	ND	0.0513	0.100	ug/L		ND					U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L		ND					U
Arsenic, Dissolved	75a	0.643	0.0373	0.200	ug/L		0.578			10.60	20	
Cadmium, Dissolved	111	0.108	0.0300	0.100	ug/L		0.110			1.83	20	
Cobalt, Dissolved	59	0.620	0.0178	0.200	ug/L		0.611			1.46	20	
Copper, Dissolved	63	1.07	0.173	0.500	ug/L		1.07			0.00		
Nickel, Dissolved	60	0.839	0.0792	0.500	ug/L		0.860			2.47	20	
Selenium, Dissolved	78	ND	0.179	0.500	ug/L		0.207					U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L		ND					U
Duplicate (BJK0585-DUP2)						Source: 21K0213-02 Prepared: 22-Nov-2021 Analyzed: 24-Nov-2021 20:45						
Chromium, Dissolved	52	ND	0.520	1.00	ug/L		ND					U
Iron, Dissolved	54	658	36.4	72.0	ug/L		655			0.42	20	D
Manganese, Dissolved	55	112	0.284	1.00	ug/L		115			2.24	20	D
Vanadium, Dissolved	51a	0.232	0.111	0.400	ug/L		0.246			5.86	20	J, D
Matrix Spike (BJK0585-MS1)						Source: 21K0213-02 Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 20:48						
Barium, Dissolved	135	27.9	0.114	0.500	ug/L	25.0	4.66	92.9	75-125			
Lead, Dissolved	208	25.1	0.0513	0.100	ug/L	25.0	ND	100	75-125			
Silver, Dissolved	107	26.2	0.0220	0.200	ug/L	25.0	ND	105	75-125			
Arsenic, Dissolved	75a	24.6	0.0373	0.200	ug/L	25.0	0.578	96.2	75-125			


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Reported:
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Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0585 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJK0585-MS1)		Source: 21K0213-02			Prepared: 22-Nov-2021		Analyzed: 23-Nov-2021 20:48					
Cadmium, Dissolved	111	24.3	0.0300	0.100	ug/L	25.0	0.110	96.9	75-125			
Cobalt, Dissolved	59	26.2	0.0178	0.200	ug/L	25.0	0.611	102	75-125			
Copper, Dissolved	63	26.6	0.173	0.500	ug/L	25.0	1.07	102	75-125			
Nickel, Dissolved	60	26.3	0.0792	0.500	ug/L	25.0	0.860	102	75-125			
Selenium, Dissolved	78	72.5	0.179	0.500	ug/L	80.0	0.207	90.4	75-125			
Zinc, Dissolved	66	77.0	2.92	6.00	ug/L	80.0	ND	96.3	75-125			

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

Matrix Spike (BJK0585-MS2)		Source: 21K0213-02			Prepared: 22-Nov-2021		Analyzed: 24-Nov-2021 20:49					
Chromium, Dissolved	52	20.8	0.520	1.00	ug/L	25.0	ND	83.3	75-125			D
Iron, Dissolved	54	4970	36.4	72.0	ug/L	5000	655	86.3	75-125			D
Manganese, Dissolved	55	130	0.284	1.00	ug/L	25.0	115	59.4	75-125			HC, D
Vanadium, Dissolved	51a	21.4	0.111	0.400	ug/L	25.0	0.246	84.6	75-125			D

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

Matrix Spike Dup (BJK0585-MSD1)		Source: 21K0213-02			Prepared: 22-Nov-2021		Analyzed: 23-Nov-2021 20:54					
Barium, Dissolved	135	27.4	0.114	0.500	ug/L	25.0	4.66	91.2	75-125	1.59	20	
Lead, Dissolved	208	24.9	0.0513	0.100	ug/L	25.0	ND	99.7	75-125	0.53	20	
Silver, Dissolved	107	26.1	0.0220	0.200	ug/L	25.0	ND	104	75-125	0.48	20	
Arsenic, Dissolved	75a	24.4	0.0373	0.200	ug/L	25.0	0.578	95.4	75-125	0.78	20	
Cadmium, Dissolved	111	24.6	0.0300	0.100	ug/L	25.0	0.110	97.9	75-125	1.03	20	
Cobalt, Dissolved	59	26.0	0.0178	0.200	ug/L	25.0	0.611	102	75-125	0.75	20	
Copper, Dissolved	63	26.3	0.173	0.500	ug/L	25.0	1.07	101	75-125	0.90	20	
Nickel, Dissolved	60	25.8	0.0792	0.500	ug/L	25.0	0.860	99.9	75-125	1.73	20	
Selenium, Dissolved	78	73.1	0.179	0.500	ug/L	80.0	0.207	91.1	75-125	0.76	20	
Zinc, Dissolved	66	77.8	2.92	6.00	ug/L	80.0	ND	97.2	75-125	0.96	20	

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

Matrix Spike Dup (BJK0585-MSD2)		Source: 21K0213-02			Prepared: 22-Nov-2021		Analyzed: 24-Nov-2021 20:53					
Chromium, Dissolved	52	20.7	0.520	1.00	ug/L	25.0	ND	82.7	75-125	0.67	20	D
Iron, Dissolved	54	5090	36.4	72.0	ug/L	5000	655	88.8	75-125	2.46	20	D
Manganese, Dissolved	55	130	0.284	1.00	ug/L	25.0	115	60.2	75-125	0.16	20	HC, D
Vanadium, Dissolved	51a	20.7	0.111	0.400	ug/L	25.0	0.246	81.6	75-125	3.51	20	D

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



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Certified Analyses included in this Report

Analyte	Certifications
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC


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Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE


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Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE


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m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE


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1,2-Dichloroethane

NELAP,WADOE

Benzene

NELAP,WADOE

EPA 8270E in Water

Phenol

NELAP,DoD-ELAP

bis(2-chloroethyl) ether

NELAP,DoD-ELAP

2-Chlorophenol

NELAP,DoD-ELAP

1,3-Dichlorobenzene

NELAP,DoD-ELAP

1,4-Dichlorobenzene

NELAP,DoD-ELAP

1,2-Dichlorobenzene

NELAP,DoD-ELAP

Benzyl Alcohol

NELAP,DoD-ELAP

2,2'-Oxybis(1-chloropropane)

NELAP,DoD-ELAP

2-Methylphenol

NELAP,DoD-ELAP

Hexachloroethane

NELAP,DoD-ELAP

N-Nitroso-di-n-Propylamine

NELAP,DoD-ELAP

4-Methylphenol

NELAP,DoD-ELAP

Nitrobenzene

NELAP,DoD-ELAP

Isophorone

NELAP,DoD-ELAP

2-Nitrophenol

NELAP,DoD-ELAP

2,4-Dimethylphenol

NELAP,DoD-ELAP

Bis(2-Chloroethoxy)methane

NELAP,DoD-ELAP

2,4-Dichlorophenol

NELAP,DoD-ELAP

1,2,4-Trichlorobenzene

NELAP,DoD-ELAP

Naphthalene

NELAP,DoD-ELAP

Benzoic acid

NELAP,DoD-ELAP

4-Chloroaniline

NELAP,DoD-ELAP

Hexachlorobutadiene

NELAP,DoD-ELAP

4-Chloro-3-Methylphenol

NELAP,DoD-ELAP

2-Methylnaphthalene

NELAP,DoD-ELAP

Hexachlorocyclopentadiene

NELAP,DoD-ELAP

2,4,6-Trichlorophenol

NELAP,DoD-ELAP

2,4,5-Trichlorophenol

NELAP,DoD-ELAP

2-Chloronaphthalene

NELAP,DoD-ELAP

2-Nitroaniline

NELAP,DoD-ELAP

Acenaphthylene

NELAP,DoD-ELAP

Dimethylphthalate

NELAP,DoD-ELAP

2,6-Dinitrotoluene

NELAP,DoD-ELAP

Acenaphthene

NELAP,DoD-ELAP

3-Nitroaniline

NELAP,DoD-ELAP

2,4-Dinitrophenol

NELAP,DoD-ELAP



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
01-Dec-2021 18:16

Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)fluoranthene, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

Project Manager: Meg Strong

Reported:

01-Dec-2021 18:16

Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

Project Manager: Meg Strong

Reported:

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Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
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Reported:
01-Dec-2021 18:16

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($<20\%$ RSD, $<20\%$ drift or minimum RRF)
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

03 December 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q4

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.

Associated Work Order(s)
21K0240

Associated SDG ID(s)
N/A

Digitally signed by
Shelly Fishel
Date: 2021.12.03
17:18:47 -08'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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: 21K0240		Turn-around Requested: Standard		Page: 1 of 1														
ARI Client Company: Shannon & Wilson, Inc.		Phone:		Date: 11/11/2021	Ice Present? Y													
Client Contact: Shoshana Howard		No. of Coolers: 3		Cooler Temps: 4.6, 5.6, 4.7														
Client Project Name: LDW		Analysis Requested				Notes/Comments												
Client Project #: 21-1-12596	Samplers: CTC, RMV																	
Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-Dx	BTEX	HVOCs	MTBE	PAHs	SVOCs (Full List)	SVOCs (L.L.)	PCBs Aroclors	Metals (Total & Diss)				
MW-40-20211111	11/11	0955	GW	13		X		X	X		X	X		①				① As, Mn, Ni, Cd, Cu, Pb, Hg, Se, Ag, Zn
MW-102-20211111	11/11	1010	GW	13		X		X	X		X	X		①				
MW-41-20211111	11/11	1125	GW	13		X		X	X		X	X		①				
MW-57-20211111	11/11	1315	GW	11		X	X	X	X					②				
MW-62-20211111	11/11	1415	GW	13		X	X	X	X				X	②				
TB-3-20211111	11/11	1430	W	5			X	X										
Comments/Special Instructions					Relinquished by:		Received by:		Relinquished by:		Received by:							
- Metals are not field filtered - Reference project for detection limits					(Signature) <i>Rose Vogt</i>		(Signature) <i>Raven Barbera</i>		(Signature)		(Signature)							
					Printed Name: <i>Rose Vogt</i>		Printed Name: <i>Raven Barbera</i>		Printed Name:		Printed Name:							
					Company: <i>Shannon & Wilson</i>		Company: <i>ARI</i>		Company:		Company:							
					Date & Time: <i>11/11/21 3:43pm</i>		Date & Time: <i>11/11/21 1543</i>		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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-40-20211111	21K0240-01	Water	11-Nov-2021 09:55	11-Nov-2021 15:43
MW-40-20211111	21K0240-02	Water	11-Nov-2021 09:55	11-Nov-2021 15:43
MW-102-20211111	21K0240-03	Water	11-Nov-2021 10:10	11-Nov-2021 15:43
MW-102-20211111	21K0240-04	Water	11-Nov-2021 10:10	11-Nov-2021 15:43
MW-41-20211111	21K0240-05	Water	11-Nov-2021 11:25	11-Nov-2021 15:43
MW-41-20211111	21K0240-06	Water	11-Nov-2021 11:25	11-Nov-2021 15:43
MW-57-20211111	21K0240-07	Water	11-Nov-2021 13:15	11-Nov-2021 15:43
MW-57-20211111	21K0240-08	Water	11-Nov-2021 13:15	11-Nov-2021 15:43
MW-62-20211111	21K0240-09	Water	11-Nov-2021 14:15	11-Nov-2021 15:43
MW-62-20211111	21K0240-10	Water	11-Nov-2021 14:15	11-Nov-2021 15:43
TB-3-20211111	21K0240-11	Water	11-Nov-2021 09:55	11-Nov-2021 15:43



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q4
Work Order: 21K0240

Sample receipt

Samples as listed on the preceding page were received 11-Nov-2021 15:43 under ARI work order 21K0240. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

The sample vial for sample 21K0240-11 contained bubbles < 2 mm in diameter.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)



Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. bis(2-ethylhexyl)phthalate, Butylbenzylphthalate and surrogate p-Terphenyl-d14 which were out of control high in the initial calibration verification (SJK0389-ICV1). All samples which contain analyte have been flagged with a "Q" qualifier. Pentachlorophenol was out of control low in the continuing calibration verification (SJK0389-CCV1). Benzoic Acid and Pentachlorophenol were out of control low in the low concentration calibration verification (SJK0389-LCV1) and (SJK0389-LCV2).

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except as follows. p-Terphenyl-d14 was out of control high in the initial calibration verification. All samples which contain analyte have been flagged with a "Q" qualifier. Phenol-d5 was out of control low in samples 21K0240-01, 21K0240-05 and method blank BJK0383-BLK1. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0240-01 in Total Metals batch BJK0508 and in association with sample 21K0240-02 in Dissolved Metals batch BJK0410. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits except Chromium which was out of control low in matrix spike BJK0508-MS2 and Copper was out of control high in the matrix spike duplicate BJK0508-MSD1. Deviations have been flagged.

Total and Dissolved Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0240-01 in Total Mercury batch BJK0411 and in association with sample 21K0240-10 in Dissolved Mercury batch BJK0647. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.



WORK ORDER

21K0240

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0240-01 A	HDPE NM, 500 mL, 1:1 HNO3	✓2	Pass (P)
21K0240-01 B	Glass NM, Amber, 500 mL		
21K0240-01 C	Glass NM, Amber, 500 mL		
21K0240-01 D	Glass NM, Amber, 500 mL		
21K0240-01 E	Glass NM, Amber, 500 mL		
21K0240-01 F	Glass NM, Amber, 500 mL		
21K0240-01 G	Glass NM, Amber, 500 mL		
21K0240-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0240-01 I	VOA Vial, Clear, 40 mL, HCL		
21K0240-01 J	VOA Vial, Clear, 40 mL, HCL		
21K0240-01 K	VOA Vial, Clear, 40 mL, HCL		
21K0240-01 L	VOA Vial, Clear, 40 mL, HCL		
21K0240-02 A	HDPE NM, 500 mL	>2	Fail
21K0240-03 A	HDPE NM, 500 mL, 1:1 HNO3	✓2	P
21K0240-03 B	Glass NM, Amber, 500 mL		
21K0240-03 C	Glass NM, Amber, 500 mL		
21K0240-03 D	Glass NM, Amber, 500 mL		
21K0240-03 E	Glass NM, Amber, 500 mL		
21K0240-03 F	Glass NM, Amber, 500 mL		
21K0240-03 G	Glass NM, Amber, 500 mL		
21K0240-03 H	VOA Vial, Clear, 40 mL, HCL		
21K0240-03 I	VOA Vial, Clear, 40 mL, HCL		
21K0240-03 J	VOA Vial, Clear, 40 mL, HCL		
21K0240-03 K	VOA Vial, Clear, 40 mL, HCL		
21K0240-03 L	VOA Vial, Clear, 40 mL, HCL		
21K0240-04 A	HDPE NM, 500 mL	>2	Fail
21K0240-05 A	HDPE NM, 500 mL, 1:1 HNO3	✓2	P
21K0240-05 B	Glass NM, Amber, 500 mL		
21K0240-05 C	Glass NM, Amber, 500 mL		
21K0240-05 D	Glass NM, Amber, 500 mL		
21K0240-05 E	Glass NM, Amber, 500 mL		
21K0240-05 F	Glass NM, Amber, 500 mL		
21K0240-05 G	Glass NM, Amber, 500 mL		
21K0240-05 H	VOA Vial, Clear, 40 mL, HCL		



WORK ORDER

21K0240

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0240-05 I	VOA Vial, Clear, 40 mL, HCL		
21K0240-05 J	VOA Vial, Clear, 40 mL, HCL		
21K0240-05 K	VOA Vial, Clear, 40 mL, HCL		
21K0240-05 L	VOA Vial, Clear, 40 mL, HCL		
21K0240-06 A	HDPE NM, 500 mL	>2	Fail
21K0240-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0240-07 B	Glass NM, Amber, 500 mL		
21K0240-07 C	Glass NM, Amber, 500 mL		
21K0240-07 D	Glass NM, Amber, 500 mL		
21K0240-07 E	Glass NM, Amber, 500 mL		
21K0240-07 F	VOA Vial, Amber, 40 mL, HCL		
21K0240-07 G	VOA Vial, Amber, 40 mL, HCL		
21K0240-07 H	VOA Vial, Amber, 40 mL, HCL		
21K0240-07 I	VOA Vial, Amber, 40 mL, HCL		
21K0240-07 J	VOA Vial, Amber, 40 mL, HCL		
21K0240-08 A	HDPE NM, 500 mL	>2	Fail
21K0240-09 A	Glass NM, Amber, 1000 mL		
21K0240-09 B	Glass NM, Amber, 1000 mL		
21K0240-09 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0240-09 D	Glass NM, Amber, 500 mL		
21K0240-09 E	Glass NM, Amber, 500 mL		
21K0240-09 F	Glass NM, Amber, 500 mL		
21K0240-09 G	Glass NM, Amber, 500 mL		
21K0240-09 H	VOA Vial, Clear, 40 mL, HCL		
21K0240-09 I	VOA Vial, Clear, 40 mL, HCL		
21K0240-09 J	VOA Vial, Clear, 40 mL, HCL		
21K0240-09 K	VOA Vial, Clear, 40 mL, HCL		
21K0240-09 L	VOA Vial, Clear, 40 mL, HCL		
21K0240-10 A	HDPE NM, 500 mL	>2	Fail
21K0240-11 A	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0240-11 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0240-11 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0240-11 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0240-11 E	VOA Vial, Clear, 40 mL, HCL	bubble	



Printed: 11/12/2021 2:05:58PM

WORK ORDER

21K0240

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

BB

Preservation Confirmed By

11/12/21

Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: LDW

COC No(s): _____ NA

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

Assigned ARI Job No: 21K0240

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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 1543

4.6 5.6 4.7

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO2565

Cooler Accepted by: RB Date: 11/11/21 Time: 1543

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

How were bottles sealed in plastic bags? _____

Individually Grouped Not

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 11/11/21

Were the sample(s) split by ARI? NA

YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: RB Date: 11/12/21 Time: 1309 Labels checked by: _____

**** 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:

Trip blank labels made by client list MTBE as an analysis but they are not running any other samples for MTBE. Logged based off COC (only BTEX & HVOC)

By: RB Date: 11/12/21



WORK ORDER

21K0240

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

HB

Preservation Confirmed By

Date

11/12/21

(1) Preserved at 0.45 Mctoly
& Preserved to pH < 2.0
with 0.75 MCL Cl_2 H₂O₂
[510414] MM/11/12/21



WORK ORDER

21K0240

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0240-05 I	VOA Vial, Clear, 40 mL, HCL			
21K0240-05 J	VOA Vial, Clear, 40 mL, HCL			
21K0240-05 K	VOA Vial, Clear, 40 mL, HCL			
21K0240-05 L	VOA Vial, Clear, 40 mL, HCL			
21K0240-06 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0240-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P	
21K0240-07 B	Glass NM, Amber, 500 mL			
21K0240-07 C	Glass NM, Amber, 500 mL			
21K0240-07 D	Glass NM, Amber, 500 mL			
21K0240-07 E	Glass NM, Amber, 500 mL			
21K0240-07 F	VOA Vial, Amber, 40 mL, HCL			
21K0240-07 G	VOA Vial, Amber, 40 mL, HCL			
21K0240-07 H	VOA Vial, Amber, 40 mL, HCL			
21K0240-07 I	VOA Vial, Amber, 40 mL, HCL			
21K0240-07 J	VOA Vial, Amber, 40 mL, HCL			
21K0240-08 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0240-09 A	Glass NM, Amber, 1000 mL			
21K0240-09 B	Glass NM, Amber, 1000 mL			
21K0240-09 C	HDPE NM, 500 mL, 1:1 HNO3	<2	P	
21K0240-09 D	Glass NM, Amber, 500 mL			
21K0240-09 E	Glass NM, Amber, 500 mL			
21K0240-09 F	Glass NM, Amber, 500 mL			
21K0240-09 G	Glass NM, Amber, 500 mL			
21K0240-09 H	VOA Vial, Clear, 40 mL, HCL			
21K0240-09 I	VOA Vial, Clear, 40 mL, HCL			
21K0240-09 J	VOA Vial, Clear, 40 mL, HCL			
21K0240-09 K	VOA Vial, Clear, 40 mL, HCL			
21K0240-09 L	VOA Vial, Clear, 40 mL, HCL			
21K0240-10 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0240-11 A	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0240-11 B	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0240-11 C	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0240-11 D	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0240-11 E	VOA Vial, Clear, 40 mL, HCL	bubble		



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-40-20211111

21K0240-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/11/2021 09:55

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 20:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-01 J

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.10	ug/L	J
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4				80-129 %	104	%	
Surrogate: Toluene-d8				80-120 %	103	%	
Surrogate: 4-Bromofluorobenzene				80-120 %	101	%	
Surrogate: 1,2-Dichlorobenzene-d4				80-120 %	100	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-01 (Water)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/11/2021 09:55

Instrument: NT10 Analyst: VTS

Analyzed: 11/28/2021 00:40

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0240-01 F 01

Preparation Batch: BJK0383

Sample Size: 1000 mL

Prepared: 11/18/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U

Surrogate: 2-Fluorophenol

30-160 %

37.4 %

Surrogate: Phenol-d5

30-160 %

24.9 %

*

Surrogate: 2-Chlorophenol-d4

30-160 %

64.8 %

Surrogate: 1,2-Dichlorobenzene-d4

30-160 %

52.0 %

Surrogate: Nitrobenzene-d5

30-160 %

63.2 %

Surrogate: 2-Fluorobiphenyl

30-160 %

70.3 %

Surrogate: 2,4,6-Tribromophenol

30-160 %

72.7 %

Surrogate: p-Terphenyl-d14

30-160 %

79.7 %

Q



Analytical Report

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Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-40-20211111

21K0240-01 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/11/2021 09:55

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 15:10

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0240-01 B 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-01 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.003	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.003	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.196	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.002	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.009	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	0.002	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.003	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.003	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	90.4	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	77.8	%	
Surrogate: Fluoranthene-d10				57-120 %	98.8	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-01 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/11/2021 09:55

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 17:58

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0240-01 D 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.354	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	97.4	%	


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 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/11/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:09

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-01 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0513	0.100	0.243	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:09

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-01 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	16.9	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	1.87	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	4.11	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-01 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/11/2021 09:55

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:12

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-01 A

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000037	mg/L	J


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-01RE1 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/11/2021 09:55

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 22:27

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-01RE1 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	10	1.42	5.00	943	ug/L	D


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-02 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 16:56

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-02 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Manganese, Dissolved	7439-96-5	10	1.42	5.00	878	ug/L	D

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:43

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-02 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-40-20211111
21K0240-02 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 09:55

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 20:04

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-02 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.190	ug/L	J

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:43

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-02 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	7.19	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.873	ug/L	
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-40-20211111

21K0240-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/11/2021 09:55

Instrument: HYDRA Analyst: ML

Analyzed: 11/24/2021 13:08

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-02 A 01

Preparation Batch: BJK0647

Sample Size: 20 mL

Filtration Batch: BJK0347

Prepared: 11/24/2021

Final Volume: 20 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-102-20211111
21K0240-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/11/2021 10:10

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 20:51

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-03 I

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.24	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	95.8	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	105	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	102	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	104	%	



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Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-102-20211111 21K0240-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/11/2021 10:10

Instrument: NT10 Analyst: VTS

Analyzed: 11/28/2021 01:17

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJK0383
Prepared: 11/18/2021

Sample Size: 1000 mL
Final Volume: 1 mL

Extract ID: 21K0240-03 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	0.2	ug/L	J

Surrogate: 2-Fluorophenol

30-160 % 45.0 %

Surrogate: Phenol-d5

30-160 % 30.3 %

Surrogate: 2-Chlorophenol-d4

30-160 % 83.2 %

Surrogate: 1,2-Dichlorobenzene-d4

30-160 % 67.3 %

Surrogate: Nitrobenzene-d5

30-160 % 80.9 %

Surrogate: 2-Fluorobiphenyl

30-160 % 88.7 %

Surrogate: 2,4,6-Tribromophenol

30-160 % 91.9 %

Surrogate: p-Terphenyl-d14

30-160 % 102 % Q



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-102-20211111 21K0240-03 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/11/2021 10:10

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 15:40

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0240-03 B 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-03 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.004	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.004	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.225	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.002	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.012	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.001	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	0.003	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	90.1	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	78.7	%	
Surrogate: Fluoranthene-d10				57-120 %	99.6	%	


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-03 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/11/2021 10:10

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 18:17

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0240-03 D 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.329	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	71.4	%	


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-03 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/11/2021 10:10

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:05

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-03 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0513	0.100	0.550	ug/L	
Manganese	7439-96-5	10	1.42	5.00	1010	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-03 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 10:10

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/23/2021 23:05

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-03 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	17.8	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	3.01	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	8.02	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.292	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-03 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/11/2021 10:10

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:23

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-03 A

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000032	mg/L	J


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-04 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 10:10

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:26

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0240-04 A 02

Preparation Batch: BJK0410

Sample Size: 25 mL

Filtration Batch: BJK0347

Prepared: 11/16/2021

Final Volume: 25 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-04 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 10:10

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:25

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-04 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.353	ug/L	J

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:26

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-04 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	6.52	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.822	ug/L	
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-102-20211111
21K0240-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/11/2021 10:10

Instrument: HYDRA Analyst: ML

Analyzed: 11/24/2021 13:11

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-04 A 01

Preparation Batch: BJK0647

Sample Size: 20 mL

Filtration Batch: BJK0347

Prepared: 11/24/2021

Final Volume: 20 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-102-20211111
21K0240-04RE1 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 10:10

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:51

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-04RE1 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	10	1.42	5.00	847	ug/L	D



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-41-20211111

21K0240-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/11/2021 11:25

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 21:16

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-05 J

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.41	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	96.0	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	105	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	99.6	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	100	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-41-20211111

21K0240-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/11/2021 11:25

Instrument: NT10 Analyst: VTS

Analyzed: 11/28/2021 01:55

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJK0383
Prepared: 11/18/2021

Sample Size: 1000 mL
Final Volume: 1 mL

Extract ID: 21K0240-05 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U

Surrogate: 2-Fluorophenol

30-160 % 40.8 %

Surrogate: Phenol-d5

30-160 % 27.3 %

*

Surrogate: 2-Chlorophenol-d4

30-160 % 72.5 %

Surrogate: 1,2-Dichlorobenzene-d4

30-160 % 56.8 %

Surrogate: Nitrobenzene-d5

30-160 % 71.9 %

Surrogate: 2-Fluorobiphenyl

30-160 % 70.5 %

Surrogate: 2,4,6-Tribromophenol

30-160 % 89.6 %

Surrogate: p-Terphenyl-d14

30-160 % 101 % Q



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-41-20211111

21K0240-05 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/11/2021 11:25

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 16:09

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0240-05 B 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-05 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.015	ug/L	
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.005	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.287	ug/L	
Acenaphthylene	208-96-8	1	0.002	0.010	0.020	ug/L	
Acenaphthene	83-32-9	1	0.003	0.010	2.35	ug/L	E
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.727	ug/L	
Phenanthrene	85-01-8	1	0.001	0.010	0.155	ug/L	
Anthracene	120-12-7	1	0.001	0.010	0.005	ug/L	J
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	99.9	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	76.7	%	
Surrogate: Fluoranthene-d10				57-120 %	97.0	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-41-20211111
21K0240-05 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/11/2021 11:25

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 18:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0240-05 D 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.654	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	96.9	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-41-20211111
21K0240-05 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/11/2021 11:25

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:07

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-05 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0513	0.100	0.0860	ug/L	J
Manganese	7439-96-5	10	1.42	5.00	709	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-41-20211111
21K0240-05 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 11:25

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:07

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-05 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	73.8	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	0.742	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	2.60	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-41-20211111

21K0240-05 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/11/2021 11:25

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:26

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-05 A

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000026	mg/L	J



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-41-20211111 21K0240-05RE1 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/11/2021 11:25

Instrument: NT11 Analyst: VTS

Analyzed: 11/30/2021 13:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0240-05RE1 B 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-05RE1 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	10	0.013	0.100	0.014	ug/L	J, D
2-Methylnaphthalene	91-57-6	10	0.010	0.100	ND	ug/L	U
1-Methylnaphthalene	90-12-0	10	0.009	0.100	0.300	ug/L	D
Acenaphthylene	208-96-8	10	0.019	0.100	ND	ug/L	U
Acenaphthene	83-32-9	10	0.029	0.100	4.59	ug/L	D
Dibenzofuran	132-64-9	10	0.015	0.100	ND	ug/L	U
Fluorene	86-73-7	10	0.015	0.100	0.760	ug/L	D
Phenanthrene	85-01-8	10	0.013	0.100	0.152	ug/L	D
Anthracene	120-12-7	10	0.012	0.100	ND	ug/L	U
Carbazole	86-74-8	10	0.012	0.100	ND	ug/L	U
Fluoranthene	206-44-0	10	0.017	0.100	ND	ug/L	U
Pyrene	129-00-0	10	0.012	0.100	ND	ug/L	U
Benzo(a)anthracene	56-55-3	10	0.008	0.100	ND	ug/L	U
Chrysene	218-01-9	10	0.009	0.100	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	10	0.005	0.100	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	10	0.032	0.100	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	10	0.019	0.100	ND	ug/L	U
Benzofluoranthenes, Total		10	0.036	0.100	ND	ug/L	U
Benzo(a)pyrene	50-32-8	10	0.025	0.100	ND	ug/L	U
Perylene	1985-5-0	10	0.059	0.100	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	0.010	0.100	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	10	0.013	0.100	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	10	0.014	0.100	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	98.8	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	40.6	%	
Surrogate: Fluoranthene-d10				57-120 %	78.3	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-41-20211111
21K0240-06 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 11:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:30

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-06 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-41-20211111
21K0240-06 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 11:25

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:30

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-06 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Sample Size: 25 mL	
	Prepared: 11/16/2021	Final Volume: 25 mL
		Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.225	ug/L	J

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:30

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-06 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Sample Size: 25 mL	
	Prepared: 11/16/2021	Final Volume: 25 mL
		Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	36.2	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.715	ug/L	
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-41-20211111

21K0240-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/11/2021 11:25

Instrument: HYDRA Analyst: ML

Analyzed: 11/24/2021 13:13

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-06 A 01

Preparation Batch: BJK0647

Sample Size: 20 mL

Filtration Batch: BJK0347

Prepared: 11/24/2021

Final Volume: 20 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-41-20211111
21K0240-06RE1 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 11:25

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:55

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-06RE1 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	10	1.42	5.00	635	ug/L	D



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-57-20211111

21K0240-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/11/2021 13:15

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 21:41

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-07 G

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				<i>80-129 %</i>	<i>100</i>	<i>%</i>	
<i>Surrogate: Toluene-d8</i>				<i>80-120 %</i>	<i>102</i>	<i>%</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>				<i>80-120 %</i>	<i>103</i>	<i>%</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				<i>80-120 %</i>	<i>101</i>	<i>%</i>	


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-57-20211111
21K0240-07 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/11/2021 13:15

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 12:19

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-07 F

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	108	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.6	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.6	%	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-57-20211111

21K0240-07 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/11/2021 13:15

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 16:40

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0240-07 B 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-07 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.004	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.004	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	0.014	ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	86.4 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	70.2 %	
Surrogate: Fluoranthene-d10					57-120 %	102 %	


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-57-20211111
21K0240-07 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/11/2021 13:15

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 18:56

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0240-07 D 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.378	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	0.301	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	105	%	


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Reported:
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MW-57-20211111
21K0240-07 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/11/2021 13:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:12

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-07 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	6.27	ug/L	
Chromium	7440-47-3	1	0.260	0.500	1.12	ug/L	
Iron	7439-89-6	1	18.2	36.0	17100	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.244	ug/L	
Manganese	7439-96-5	10	1.42	5.00	757	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	0.0280	ug/L	J
Vanadium	7440-62-2	1	0.0556	0.200	5.79	ug/L	


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 Project: Lower Duwamish Q4
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Reported:
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MW-57-20211111
21K0240-07 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 13:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:12

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-07 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	6.66	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	2.34	ug/L	
Copper	7440-50-8	1	0.173	0.500	2.24	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	3.54	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.201	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U


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 Project Manager: Meg Strong

Reported:
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MW-57-20211111
21K0240-07 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/11/2021 13:15

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:28

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-07 A

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000031	mg/L	J


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-57-20211111
21K0240-08 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 13:15

Instrument: ICPMS2 Analyst: SKD

Analyzed: 11/22/2021 20:10

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0240-08 A 02

Preparation Batch: BJK0410

Sample Size: 25 mL

Filtration Batch: BJK0347

Prepared: 11/16/2021

Final Volume: 25 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium, Dissolved	7440-39-3	1	0.114	0.500	0.266	ug/L	J
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.679	ug/L	
Iron, Dissolved	7439-89-6	1	18.2	36.0	11200	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	1.78	ug/L	



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-57-20211111

21K0240-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 13:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21K0240-08 A 02
Preparation Batch: BJK0410 Sample Size: 25 mL Filtration Batch: BJK0347
Prepared: 11/16/2021 Final Volume: 25 mL Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21K0240-08 A 02
Preparation Batch: BJK0410 Sample Size: 25 mL Filtration Batch: BJK0347
Prepared: 11/16/2021 Final Volume: 25 mL Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	4.85	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	2.05	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	2.88	ug/L	
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-57-20211111

21K0240-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/11/2021 13:15

Instrument: HYDRA Analyst: ML

Analyzed: 11/24/2021 13:15

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-08 A 01

Preparation Batch: BJK0647

Sample Size: 20 mL

Filtration Batch: BJK0347

Prepared: 11/24/2021

Final Volume: 20 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-57-20211111
21K0240-08RE1 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 13:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 19:01

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-08RE1 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	10	1.42	5.00	717	ug/L	D


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-62-20211111
21K0240-09 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/11/2021 14:15

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 22:06

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-09 H

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	98.6	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	106	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	102	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	104	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-62-20211111
21K0240-09 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/11/2021 14:15

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 12:40

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-09 J

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	106	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.4	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-62-20211111

21K0240-09 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/11/2021 14:15

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 17:10

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0240-09 D 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-09 D 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.004	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	0.002	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	0.001	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	0.014	ug/L	
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	86.8 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	75.5 %	
Surrogate: Fluoranthene-d10					57-120 %	99.6 %	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-62-20211111
21K0240-09 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/11/2021 14:15

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 19:15

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0240-09 F 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>97.3</i>	<i>%</i>	



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
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Reported:
03-Dec-2021 16:54

MW-62-20211111

21K0240-09 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 11/11/2021 14:15

Instrument: ECD7 Analyst: JGR

Analyzed: 11/27/2021 21:15

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0382 Prepared: 11/18/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0240-09 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0297 Cleaned: 27-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0240-09 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0299 Cleaned: 26-Nov-2021	Initial Volume: 500 uL Final Volume: 500 uL	Extract ID: 21K0240-09 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0298 Cleaned: 27-Nov-2021	Initial Volume: 500 uL Final Volume: 500 uL	Extract ID: 21K0240-09 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				29-120 %	88.7	%	
Surrogate: Tetrachlorometaxylene				32-120 %	77.5	%	
Surrogate: Decachlorobiphenyl [2C]				29-120 %	96.3	%	
Surrogate: Tetrachlorometaxylene [2C]				32-120 %	77.8	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-62-20211111
21K0240-09 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/11/2021 14:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:17

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-09 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	14.1	ug/L	
Chromium	7440-47-3	1	0.260	0.500	0.946	ug/L	
Iron	7439-89-6	1	18.2	36.0	2670	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.670	ug/L	
Manganese	7439-96-5	1	0.142	0.500	178	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	6.29	ug/L	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-62-20211111
21K0240-09 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 14:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:17

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0508 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0240-09 C 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	2.27	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	0.0310	ug/L	J
Cobalt	7440-48-4	1	0.0178	0.200	6.66	ug/L	
Copper	7440-50-8	1	0.173	0.500	4.80	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	11.0	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.449	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	5.32	ug/L	J



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-62-20211111

21K0240-09 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/11/2021 14:15

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:35

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-09 C

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000034	mg/L	J


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

MW-62-20211111
21K0240-10 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/11/2021 14:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:39

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-10 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Sample Size: 25 mL	
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	1	18.2	36.0	42.9	ug/L	
Manganese, Dissolved	7439-96-5	1	0.142	0.500	183	ug/L	

Instrument: ICPMS2 Analyst: SKD

Analyzed: 11/22/2021 20:54

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-10 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Sample Size: 25 mL	
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	11.0	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.293	ug/L	J
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	1.46	ug/L	


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Reported:
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MW-62-20211111
21K0240-10 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/11/2021 14:15

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 18:39

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-10 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Selenium, Dissolved	7782-49-2	1	0.179	0.500	0.287	ug/L	J

Instrument: ICPMS2 Analyst: MCB

Analyzed: 11/16/2021 22:39

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0240-10 A 02
	Preparation Batch: BJK0410	Filtration Batch: BJK0347
	Prepared: 11/16/2021	Filtration Date: 11/12/2021 15:51
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.433	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	0.0670	ug/L	J
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	5.98	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	2.08	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	9.03	ug/L	
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

MW-62-20211111

21K0240-10 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/11/2021 14:15

Instrument: HYDRA Analyst: ML

Analyzed: 11/24/2021 12:54

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0240-10 A 01

Preparation Batch: BJK0647

Sample Size: 20 mL

Filtration Batch: BJK0347

Prepared: 11/24/2021

Final Volume: 20 mL

Filtration Date: 11/12/2021 15:51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

TB-3-20211111
21K0240-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/11/2021 09:55

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 14:57

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BJK0419
Prepared: 11/16/2021

Sample Size: 10 mL
Final Volume: 10 mL

Extract ID: 21K0240-11 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	95.3	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	104	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	103	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	103	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

TB-3-20211111
21K0240-11 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/11/2021 09:55

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 11:15

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0240-11 A

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	110	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	96.9	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0419 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0419-BLK2)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 14:07					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.89			ug/L	5.00		97.7	80-129			
<i>Surrogate: Toluene-d8</i>	5.13			ug/L	5.00		103	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.39			ug/L	5.00		108	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.84			ug/L	5.00		96.8	80-120			
LCS (BJK0419-BS2)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 12:26					
Vinyl Chloride	9.27	0.08	0.20	ug/L	10.0		92.7	66-133			
1,1-Dichloroethene	9.14	0.08	0.20	ug/L	10.0		91.4	69-135			
trans-1,2-Dichloroethene	9.41	0.07	0.20	ug/L	10.0		94.1	78-128			
cis-1,2-Dichloroethene	9.55	0.08	0.20	ug/L	10.0		95.5	80-121			
Benzene	10.1	0.05	0.20	ug/L	10.0		101	80-120			
Trichloroethene	10.1	0.07	0.20	ug/L	10.0		101	80-120			
Toluene	10.2	0.05	0.20	ug/L	10.0		102	80-120			
Tetrachloroethene	10.5	0.09	0.20	ug/L	10.0		105	80-120			
Ethylbenzene	9.90	0.05	0.20	ug/L	10.0		99.0	80-120			
m,p-Xylene	20.7	0.14	0.40	ug/L	20.0		103	80-121			
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Xylenes, total	30.7	0.22	0.60	ug/L	30.0		102	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.66			ug/L	5.00		93.1	80-129			
<i>Surrogate: Toluene-d8</i>	5.22			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.23			ug/L	5.00		105	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.90			ug/L	5.00		98.1	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0419 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0419-BSD2)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 13:16					
Vinyl Chloride	9.57	0.08	0.20	ug/L	10.0		95.7	66-133	3.09	30	
1,1-Dichloroethene	9.23	0.08	0.20	ug/L	10.0		92.3	69-135	0.99	30	
trans-1,2-Dichloroethene	9.65	0.07	0.20	ug/L	10.0		96.5	78-128	2.52	30	
cis-1,2-Dichloroethene	9.94	0.08	0.20	ug/L	10.0		99.4	80-121	4.01	30	
Benzene	10.5	0.05	0.20	ug/L	10.0		105	80-120	3.81	30	
Trichloroethene	10.7	0.07	0.20	ug/L	10.0		107	80-120	6.17	30	
Toluene	10.6	0.05	0.20	ug/L	10.0		106	80-120	3.43	30	
Tetrachloroethene	11.1	0.09	0.20	ug/L	10.0		111	80-120	5.37	30	
Ethylbenzene	10.6	0.05	0.20	ug/L	10.0		106	80-120	6.58	30	
m,p-Xylene	21.1	0.14	0.40	ug/L	20.0		106	80-121	2.29	30	
o-Xylene	10.3	0.08	0.20	ug/L	10.0		103	80-121	2.77	30	
Xylenes, total	31.5	0.22	0.60	ug/L	30.0		105	76-127	2.45	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.96			ug/L	5.00		99.2	80-129			
<i>Surrogate: Toluene-d8</i>	5.30			ug/L	5.00		106	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.34			ug/L	5.00		107	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.01			ug/L	5.00		100	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - SIM - Quality Control
Batch BJK0498 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0498-BLK1)					Prepared: 19-Nov-2021 Analyzed: 19-Nov-2021 10:30					
Vinyl chloride	ND	5.01	20.0	ng/L						U
Surrogate: 1,2-Dichloroethane-d4	5230			ng/L	5000	105	80-129			
Surrogate: Toluene-d8	5150			ng/L	5000	103	80-120			
Surrogate: 4-Bromofluorobenzene	4880			ng/L	5000	97.6	75-125			
LCS (BJK0498-BS1)					Prepared: 19-Nov-2021 Analyzed: 19-Nov-2021 09:08					
Vinyl chloride	2310	5.01	20.0	ng/L	2000	116	62-141			
Surrogate: 1,2-Dichloroethane-d4	5210			ng/L	5000	104	80-129			
Surrogate: Toluene-d8	5690			ng/L	5000	114	80-120			
Surrogate: 4-Bromofluorobenzene	5110			ng/L	5000	102	75-125			
LCS Dup (BJK0498-BSD1)					Prepared: 19-Nov-2021 Analyzed: 19-Nov-2021 09:29					
Vinyl chloride	2030	5.01	20.0	ng/L	2000	101	62-141	13.30	30	
Surrogate: 1,2-Dichloroethane-d4	5160			ng/L	5000	103	80-129			
Surrogate: Toluene-d8	5300			ng/L	5000	106	80-120			
Surrogate: 4-Bromofluorobenzene	5160			ng/L	5000	103	75-125			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Semivolatiles Organic Compounds - Quality Control

Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0383-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 22:47					
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
Surrogate: 2-Fluorophenol	3.47			ug/L	7.50		46.3	30-160			
Surrogate: Phenol-d5	2.24			ug/L	7.50		29.8	30-160			*
Surrogate: 2-Chlorophenol-d4	6.18			ug/L	7.50		82.5	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.27			ug/L	5.00		65.3	30-160			
Surrogate: Nitrobenzene-d5	3.90			ug/L	5.00		77.9	30-160			
Surrogate: 2-Fluorobiphenyl	4.08			ug/L	5.00		81.6	30-160			
Surrogate: 2,4,6-Tribromophenol	7.02			ug/L	7.50		93.5	30-160			
Surrogate: p-Terphenyl-d14	5.11			ug/L	5.00		102	30-160			Q
LCS (BJK0383-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 23:25					
1,4-Dichlorobenzene	3.9	0.03	0.2	ug/L	5.00		77.5	30-160			
1,2-Dichlorobenzene	3.5	0.03	0.2	ug/L	5.00		69.5	30-160			
2,4-Dimethylphenol	10.3	0.3	1.0	ug/L	13.0		79.3	30-160			
Benzoic acid	8.9	0.1	2.0	ug/L	23.0		38.6	30-160			
N-Nitrosodiphenylamine	4.2	0.03	0.2	ug/L	5.00		84.5	30-160			
Pentachlorophenol	7.4	0.1	1.0	ug/L	13.0		57.1	30-160			Q
Di-n-Butylphthalate	5.0	0.05	0.2	ug/L	5.00		99.2	30-160			
Butylbenzylphthalate	5.3	0.07	0.2	ug/L	5.00		106	30-160			Q
bis(2-Ethylhexyl)phthalate	5.0	0.2	0.2	ug/L	5.00		101	30-160			Q
Surrogate: 2-Fluorophenol	4.26			ug/L	7.50		56.8	30-160			
Surrogate: Phenol-d5	3.02			ug/L	7.50		40.2	30-160			
Surrogate: 2-Chlorophenol-d4	6.63			ug/L	7.50		88.5	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.40			ug/L	5.00		68.0	30-160			
Surrogate: Nitrobenzene-d5	4.43			ug/L	5.00		88.7	30-160			
Surrogate: 2-Fluorobiphenyl	4.41			ug/L	5.00		88.2	30-160			


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0383-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 23:25					
Surrogate: 2,4,6-Tribromophenol	7.63			ug/L	7.50		102	30-160			
Surrogate: p-Terphenyl-d14	5.70			ug/L	5.00		114	30-160			Q
LCS Dup (BJK0383-BSD1)						Prepared: 18-Nov-2021 Analyzed: 28-Nov-2021 00:02					
1,4-Dichlorobenzene	4.2	0.03	0.2	ug/L	5.00		83.8	30-160	7.79	30	
1,2-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		75.9	30-160	8.75	30	
2,4-Dimethylphenol	11.0	0.3	1.0	ug/L	13.0		85.0	30-160	6.89	30	
Benzoic acid	9.7	0.1	2.0	ug/L	23.0		42.0	30-160	8.30	30	
N-Nitrosodiphenylamine	4.6	0.03	0.2	ug/L	5.00		91.4	30-160	7.83	30	
Pentachlorophenol	7.6	0.1	1.0	ug/L	13.0		58.4	30-160	2.30	30	Q
Di-n-Butylphthalate	5.2	0.05	0.2	ug/L	5.00		103	30-160	3.96	30	
Butylbenzylphthalate	5.5	0.07	0.2	ug/L	5.00		110	30-160	3.26	30	Q
bis(2-Ethylhexyl)phthalate	5.2	0.2	0.2	ug/L	5.00		104	30-160	3.41	30	Q
Surrogate: 2-Fluorophenol	4.20			ug/L	7.50		56.1	30-160			
Surrogate: Phenol-d5	3.04			ug/L	7.50		40.5	30-160			
Surrogate: 2-Chlorophenol-d4	6.61			ug/L	7.50		88.1	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.63			ug/L	5.00		72.6	30-160			
Surrogate: Nitrobenzene-d5	4.61			ug/L	5.00		92.1	30-160			
Surrogate: 2-Fluorobiphenyl	4.55			ug/L	5.00		91.0	30-160			
Surrogate: 2,4,6-Tribromophenol	7.64			ug/L	7.50		102	30-160			
Surrogate: p-Terphenyl-d14	5.60			ug/L	5.00		112	30-160			Q



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJK0380 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0380-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 13:40					
Naphthalene	0.003	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.002	0.001	0.010	ug/L							J
1-Methylnaphthalene	0.001	0.0009	0.010	ug/L							J
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	ND	0.002	0.010	ug/L							U
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
Surrogate: 2-Methylnaphthalene-d10	0.251			ug/L	0.300		83.7	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.204			ug/L	0.300		68.0	29-120			
Surrogate: Fluoranthene-d10	0.280			ug/L	0.300		93.2	57-120			

LCS (BJK0380-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 14:09					
Naphthalene	0.230	0.001	0.010	ug/L	0.300		76.8	37-120			
2-Methylnaphthalene	0.251	0.001	0.010	ug/L	0.300		83.8	37-120			
1-Methylnaphthalene	0.252	0.0009	0.010	ug/L	0.300		83.9	29-120			
Acenaphthylene	0.262	0.002	0.010	ug/L	0.300		87.4	41-120			
Acenaphthene	0.261	0.003	0.010	ug/L	0.300		87.0	41-120			
Dibenzofuran	0.242	0.002	0.010	ug/L	0.300		80.7	38-120			
Fluorene	0.264	0.002	0.010	ug/L	0.300		87.9	43-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0380 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0380-BS1)						Prepared: 18-Nov-2021	Analyzed: 27-Nov-2021 14:09				
Phenanthrene	0.255	0.001	0.010	ug/L	0.300		85.2	41-120			
Anthracene	0.248	0.001	0.010	ug/L	0.300		82.5	40-120			
Carbazole	0.269	0.001	0.010	ug/L	0.300		89.8	30-160			
Fluoranthene	0.265	0.002	0.010	ug/L	0.300		88.4	45-120			
Pyrene	0.265	0.001	0.010	ug/L	0.300		88.4	41-120			
Benzo(a)anthracene	0.271	0.0008	0.010	ug/L	0.300		90.2	42-120			
Chrysene	0.251	0.0009	0.010	ug/L	0.300		83.7	44-120			
Benzo(b)fluoranthene	0.260	0.0005	0.010	ug/L	0.300		86.7	44-120			
Benzo(k)fluoranthene	0.248	0.003	0.010	ug/L	0.300		82.7	50-120			
Benzo(j)fluoranthene	0.238	0.002	0.010	ug/L	0.300		79.4	39-160			
Benzofluoranthenes, Total	0.746	0.004	0.010	ug/L	0.900		82.9	46-120			
Benzo(a)pyrene	0.225	0.002	0.010	ug/L	0.300		75.0	35-120			
Perylene	0.221	0.006	0.010	ug/L	0.300		73.7	30-160			
Indeno(1,2,3-cd)pyrene	0.244	0.001	0.010	ug/L	0.300		81.4	37-120			
Dibenzo(a,h)anthracene	0.245	0.001	0.010	ug/L	0.300		81.5	34-120			
Benzo(g,h,i)perylene	0.202	0.001	0.010	ug/L	0.300		67.2	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.273			ug/L	0.300		90.9	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.243			ug/L	0.300		80.9	29-120			
Surrogate: Fluoranthene-d10	0.293			ug/L	0.300		97.6	57-120			
LCS Dup (BJK0380-BSD1)						Prepared: 18-Nov-2021	Analyzed: 27-Nov-2021 14:40				
Naphthalene	0.245	0.001	0.010	ug/L	0.300		81.7	37-120	6.17	30	
2-Methylnaphthalene	0.266	0.001	0.010	ug/L	0.300		88.7	37-120	5.65	30	
1-Methylnaphthalene	0.263	0.0009	0.010	ug/L	0.300		87.8	29-120	4.59	30	
Acenaphthylene	0.283	0.002	0.010	ug/L	0.300		94.4	41-120	7.66	30	
Acenaphthene	0.284	0.003	0.010	ug/L	0.300		94.6	41-120	8.32	30	
Dibenzofuran	0.265	0.002	0.010	ug/L	0.300		88.4	38-120	9.14	30	
Fluorene	0.285	0.002	0.010	ug/L	0.300		95.0	43-120	7.81	30	
Phenanthrene	0.276	0.001	0.010	ug/L	0.300		92.0	41-120	7.77	30	
Anthracene	0.270	0.001	0.010	ug/L	0.300		89.9	40-120	8.59	30	
Carbazole	0.284	0.001	0.010	ug/L	0.300		94.7	30-160	5.30	30	
Fluoranthene	0.284	0.002	0.010	ug/L	0.300		94.8	45-120	6.99	30	
Pyrene	0.282	0.001	0.010	ug/L	0.300		94.0	41-120	6.16	30	
Benzo(a)anthracene	0.287	0.0008	0.010	ug/L	0.300		95.8	42-120	5.99	30	
Chrysene	0.267	0.0009	0.010	ug/L	0.300		88.9	44-120	6.08	30	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0380 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0380-BSD1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 14:40					
Benzo(b)fluoranthene	0.280	0.0005	0.010	ug/L	0.300		93.5	44-120	7.50	30	
Benzo(k)fluoranthene	0.268	0.003	0.010	ug/L	0.300		89.3	50-120	7.68	30	
Benzo(j)fluoranthene	0.259	0.002	0.010	ug/L	0.300		86.2	39-160	8.23	30	
Benzofluoranthenes, Total	0.807	0.004	0.010	ug/L	0.900		89.7	46-120	7.79	30	
Benzo(a)pyrene	0.244	0.002	0.010	ug/L	0.300		81.4	35-120	8.24	30	
Perylene	0.237	0.006	0.010	ug/L	0.300		78.8	30-160	6.75	30	
Indeno(1,2,3-cd)pyrene	0.255	0.001	0.010	ug/L	0.300		85.1	37-120	4.51	30	
Dibenzo(a,h)anthracene	0.254	0.001	0.010	ug/L	0.300		84.7	34-120	3.78	30	
Benzo(g,h,i)perylene	0.210	0.001	0.010	ug/L	0.300		69.9	38-120	3.96	30	
Surrogate: 2-Methylnaphthalene-d10	0.274			ug/L	0.300		91.4	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.243			ug/L	0.300		81.1	29-120			
Surrogate: Fluoranthene-d10	0.304			ug/L	0.300		101	57-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJK0381 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0381-BLK1)		Prepared: 17-Nov-2021 Analyzed: 22-Nov-2021 16:40								
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
<i>Surrogate: o-Terphenyl</i>	0.220		mg/L	0.225		97.6	50-150			
LCS (BJK0381-BS1)		Prepared: 17-Nov-2021 Analyzed: 22-Nov-2021 16:59								
Diesel Range Organics (C12-C24)	2.57	0.100	mg/L	3.00		85.6	56-120			
<i>Surrogate: o-Terphenyl</i>	0.225		mg/L	0.225		100	50-150			
LCS Dup (BJK0381-BSD1)		Prepared: 17-Nov-2021 Analyzed: 22-Nov-2021 17:19								
Diesel Range Organics (C12-C24)	2.85	0.100	mg/L	3.00		95.1	56-120	10.50	30	
<i>Surrogate: o-Terphenyl</i>	0.233		mg/L	0.225		104	50-150			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJK0382 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0382-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 19:50					
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0159			ug/L	0.0200		79.5	29-120			
Surrogate: Tetrachlorometaxylene	0.0127			ug/L	0.0200		63.4	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0166			ug/L	0.0200		83.1	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0117			ug/L	0.0200		58.6	32-120			
LCS (BJK0382-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 20:11					
Aroclor 1016	0.045	0.002	0.010	ug/L	0.0500		90.2	54-120			
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		82.3	51-128			
Surrogate: Decachlorobiphenyl	0.0160			ug/L	0.0200		80.2	29-120			
Surrogate: Tetrachlorometaxylene	0.0151			ug/L	0.0200		75.4	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0164			ug/L	0.0200		82.2	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0145			ug/L	0.0200		72.4	32-120			
LCS Dup (BJK0382-BSD1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 20:32					
Aroclor 1016	0.042	0.002	0.010	ug/L	0.0500		83.7	54-120	7.56	30	
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		81.1	51-128	1.45	30	
Surrogate: Decachlorobiphenyl	0.0162			ug/L	0.0200		81.0	29-120			
Surrogate: Tetrachlorometaxylene	0.0144			ug/L	0.0200		71.8	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0165			ug/L	0.0200		82.7	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0133			ug/L	0.0200		66.6	32-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0411 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0411-BLK1)						Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:07					
Mercury	0.000030	0.000013	0.000100	mg/L							J
LCS (BJK0411-BS1)						Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:09					
Mercury	0.00171	0.000013	0.000100	mg/L	0.00200		85.6	80-120			
Duplicate (BJK0411-DUP1)						Source: 21K0240-01 Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:14					
Mercury	0.000032	0.000013	0.000100	mg/L		0.000037			16.30	20	J
Matrix Spike (BJK0411-MS1)						Source: 21K0240-01 Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:16					
Mercury	0.000863	0.000013	0.000100	mg/L	0.00100	0.000037	82.6	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJK0411-MSD1)						Source: 21K0240-01 Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:19					
Mercury	0.000852	0.000013	0.000100	mg/L	0.00100	0.000037	81.5	75-125	1.34	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0508 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0508-BLK1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 22:46						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Manganese	55	0.176	0.142	0.500	ug/L							J
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Selenium	78	ND	0.179	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U

LCS (BJK0508-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 22:50						
Barium	135	23.8	0.114	0.500	ug/L	25.0		95.1	80-120			
Barium	137	23.7	0.0765	0.500	ug/L	25.0		94.8	80-120			
Chromium	52	24.3	0.260	0.500	ug/L	25.0		97.4	80-120			
Chromium	53	25.0	0.239	0.500	ug/L	25.0		99.9	80-120			
Iron	54	5160	18.2	36.0	ug/L	5000		103	80-120			
Iron	57	5260	6.63	36.0	ug/L	5000		105	80-120			
Lead	208	25.6	0.0513	0.100	ug/L	25.0		103	80-120			
Manganese	55	24.3	0.142	0.500	ug/L	25.0		97.1	80-120			
Silver	107	26.9	0.0220	0.200	ug/L	25.0		108	80-120			
Vanadium	51a	23.7	0.0556	0.200	ug/L	25.0		94.7	80-120			
Vanadium	51b	23.9	0.0521	0.200	ug/L	25.0		95.5	80-120			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0508 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0508-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 22:50						
Arsenic	75a	25.0	0.0373	0.200	ug/L	25.0		99.8	80-120			
Cadmium	111	25.9	0.0300	0.100	ug/L	25.0		104	80-120			
Cadmium	114	25.7	0.0400	0.100	ug/L	25.0		103	80-120			
Cobalt	59	26.1	0.0178	0.200	ug/L	25.0		105	80-120			
Copper	63	26.9	0.173	0.500	ug/L	25.0		108	80-120			
Copper	65	26.2	0.350	0.500	ug/L	25.0		105	80-120			
Nickel	60	26.0	0.0792	0.500	ug/L	25.0		104	80-120			
Nickel	62	26.8	0.220	0.500	ug/L	25.0		107	80-120			
Selenium	78	78.8	0.179	0.500	ug/L	80.0		98.5	80-120			
Zinc	66	83.2	2.92	6.00	ug/L	80.0		104	80-120			
Zinc	67	78.2	0.940	6.00	ug/L	80.0		97.8	80-120			
Duplicate (BJK0508-DUP1)						Source: 21K0240-01 Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 23:14						
Barium	135	9.20	0.114	0.500	ug/L		8.86			3.74	20	
Lead	208	0.251	0.0513	0.100	ug/L		0.243			3.24	20	
Silver	107	ND	0.0220	0.200	ug/L		ND					U
Arsenic	75a	17.3	0.0373	0.200	ug/L		16.9			2.10	20	
Cadmium	111	ND	0.0300	0.100	ug/L		ND					U
Cobalt	59	0.438	0.0178	0.200	ug/L		0.428			2.31	20	
Copper	63	1.75	0.173	0.500	ug/L		1.87			6.51	20	
Nickel	60	4.12	0.0792	0.500	ug/L		4.11			0.29	20	
Selenium	78	ND	0.179	0.500	ug/L		ND					U
Zinc	66	ND	2.92	6.00	ug/L		ND					U
Duplicate (BJK0508-DUP2)						Source: 21K0240-01 Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:14						
Chromium	52	1.59	0.520	1.00	ug/L		1.62			1.49	20	D
Iron	54	10200	36.4	72.0	ug/L		10200			0.55	20	D
Vanadium	51a	6.84	0.111	0.400	ug/L		6.86			0.38	20	D
Duplicate (BJK0508-DUP3)						Source: 21K0240-01RE1 Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:31						
Manganese	55	995	1.42	5.00	ug/L		943			5.32	20	D
Matrix Spike (BJK0508-MS1)						Source: 21K0240-01 Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 23:19						
Barium	135	31.2	0.114	0.500	ug/L	25.0	8.86	89.5	75-125			
Lead	208	23.6	0.0513	0.100	ug/L	25.0	0.243	93.3	75-125			
Silver	107	23.5	0.0220	0.200	ug/L	25.0	ND	94.2	75-125			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BJK0508 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJK0508-MS1)		Source: 21K0240-01			Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 23:19							
Arsenic	75a	40.6	0.0373	0.200	ug/L	25.0	16.9	94.8	75-125			
Cadmium	111	22.7	0.0300	0.100	ug/L	25.0	ND	90.9	75-125			
Cobalt	59	24.8	0.0178	0.200	ug/L	25.0	0.428	97.3	75-125			
Copper	63	25.9	0.173	0.500	ug/L	25.0	1.87	96.2	75-125			
Nickel	60	28.4	0.0792	0.500	ug/L	25.0	4.11	97.4	75-125			
Selenium	78	69.8	0.179	0.500	ug/L	80.0	ND	87.2	75-125			
Zinc	66	72.9	2.92	6.00	ug/L	80.0	ND	91.2	75-125			

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

Matrix Spike (BJK0508-MS2)		Source: 21K0240-01			Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:18							
Chromium	52	20.3	0.520	1.00	ug/L	25.0	1.62	74.7	75-125			*, D
Iron	54	14700	36.4	72.0	ug/L	5000	10200	90.6	75-125			D
Vanadium	51a	25.7	0.111	0.400	ug/L	25.0	6.86	75.2	75-125			D

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

Matrix Spike (BJK0508-MS3)		Source: 21K0240-01RE1			Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:35							
Manganese	55	1000	1.42	5.00	ug/L	25.0	943	226	75-125			HC, D

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

Matrix Spike Dup (BJK0508-MSD1)		Source: 21K0240-01			Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 23:26							
Barium	135	33.7	0.114	0.500	ug/L	25.0	8.86	99.3	75-125	7.58	20	
Lead	208	25.7	0.0513	0.100	ug/L	25.0	0.243	102	75-125	8.72	20	
Silver	107	26.3	0.0220	0.200	ug/L	25.0	ND	105	75-125	11.10	20	
Arsenic	75a	42.3	0.0373	0.200	ug/L	25.0	16.9	102	75-125	4.05	20	
Cadmium	111	24.8	0.0300	0.100	ug/L	25.0	ND	99.1	75-125	8.57	20	
Cobalt	59	26.7	0.0178	0.200	ug/L	25.0	0.428	105	75-125	7.48	20	
Copper	63	36.0	0.173	0.500	ug/L	25.0	1.87	137	75-125	32.50	20	*
Nickel	60	30.4	0.0792	0.500	ug/L	25.0	4.11	105	75-125	6.68	20	
Selenium	78	73.7	0.179	0.500	ug/L	80.0	ND	92.1	75-125	5.46	20	
Zinc	66	81.2	2.92	6.00	ug/L	80.0	ND	102	75-125	10.80	20	

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

Matrix Spike Dup (BJK0508-MSD2)		Source: 21K0240-01			Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:22							
Chromium	52	22.0	0.520	1.00	ug/L	25.0	1.62	81.5	75-125	8.08	20	D
Iron	54	14800	36.4	72.0	ug/L	5000	10200	92.4	75-125	0.61	20	D


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0508 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BJK0508-MSD2)		Source: 21K0240-01		Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:22								
Vanadium	51a	27.4	0.111	0.400	ug/L	25.0	6.86	82.1	75-125	6.56	20	D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BJK0508-MSD3)		Source: 21K0240-01RE1		Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 22:38								
Manganese	55	990	1.42	5.00	ug/L	25.0	943	186	75-125	1.00	20	HC, D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJK0410 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0410-BLK3)						Prepared: 16-Nov-2021 Analyzed: 23-Nov-2021 17:47						
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U

LCS (BJK0410-BS3)						Prepared: 16-Nov-2021 Analyzed: 23-Nov-2021 17:52						
Manganese, Dissolved	55	25.7	0.142	0.500	ug/L	25.0		103	80-120			
Selenium, Dissolved	78	77.4	0.179	0.500	ug/L	80.0		96.7	80-120			

Duplicate (BJK0410-DUP3)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 29-Nov-2021 20:08						
Selenium, Dissolved	78	ND	0.179	0.500	ug/L		0.190					U

Duplicate (BJK0410-DUP4)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 30-Nov-2021 17:00						
Iron, Dissolved	54	1030	182	360	ug/L		989			4.06	20	D
Manganese, Dissolved	55	895	1.42	5.00	ug/L		878			1.95	20	D

Matrix Spike (BJK0410-MS3)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 29-Nov-2021 20:13						
Selenium, Dissolved	78	79.4	0.179	0.500	ug/L	80.0	0.190	99.0	75-125			

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

Matrix Spike (BJK0410-MS4)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 30-Nov-2021 17:05						
Iron, Dissolved	54	6070	182	360	ug/L	5000	989	102	75-125			D
Manganese, Dissolved	55	912	1.42	5.00	ug/L	25.0	878	135	75-125			HC, D

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

Matrix Spike Dup (BJK0410-MSD3)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 29-Nov-2021 20:19						
Selenium, Dissolved	78	76.0	0.179	0.500	ug/L	80.0	0.190	94.8	75-125	4.33	20	

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

Matrix Spike Dup (BJK0410-MSD4)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 30-Nov-2021 17:09						
Iron, Dissolved	54	6090	182	360	ug/L	5000	989	102	75-125	0.26	20	D
Manganese, Dissolved	55	905	1.42	5.00	ug/L	25.0	878	109	75-125	0.73	20	HC, D

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

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0410 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0410-BLK1)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 20:22						
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
Blank (BJK0410-BLK2)						Prepared: 16-Nov-2021 Analyzed: 22-Nov-2021 19:24						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	18.2	36.0	ug/L							U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
LCS (BJK0410-BS1)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 20:27						
Chromium, Dissolved	52	25.9	0.260	0.500	ug/L	25.0		103	80-120			
Chromium, Dissolved	53	25.2	0.239	0.500	ug/L	25.0		101	80-120			
Lead, Dissolved	208	26.3	0.0513	0.100	ug/L	25.0		105	80-120			
Arsenic, Dissolved	75a	24.3	0.0373	0.200	ug/L	25.0		97.3	80-120			
Cadmium, Dissolved	111	25.0	0.0300	0.100	ug/L	25.0		100	80-120			
Cadmium, Dissolved	114	24.9	0.0400	0.100	ug/L	25.0		99.5	80-120			
Copper, Dissolved	63	25.6	0.173	0.500	ug/L	25.0		103	80-120			
Copper, Dissolved	65	26.2	0.350	0.500	ug/L	25.0		105	80-120			
Nickel, Dissolved	60	25.6	0.0792	0.500	ug/L	25.0		103	80-120			
Nickel, Dissolved	62	25.6	0.220	0.500	ug/L	25.0		102	80-120			
Zinc, Dissolved	66	77.6	2.92	6.00	ug/L	80.0		97.0	80-120			
Zinc, Dissolved	67	70.7	0.940	6.00	ug/L	80.0		88.4	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BJK0410 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0410-BS1)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 20:27						
LCS (BJK0410-BS2)						Prepared: 16-Nov-2021 Analyzed: 22-Nov-2021 19:29						
Barium, Dissolved	135	25.5	0.114	0.500	ug/L	25.0		102	80-120			
Barium, Dissolved	137	25.5	0.0765	0.500	ug/L	25.0		102	80-120			
Iron, Dissolved	54	5430	18.2	36.0	ug/L	5000		109	80-120			
Iron, Dissolved	57	5370	18.2	36.0	ug/L	5000		107	80-120			
Silver, Dissolved	107	26.0	0.0220	0.200	ug/L	25.0		104	80-120			
Vanadium, Dissolved	51a	23.5	0.0556	0.200	ug/L	25.0		94.0	80-120			
Vanadium, Dissolved	51b	23.9	0.0521	0.200	ug/L	25.0		95.4	80-120			
Cobalt, Dissolved	59	24.8	0.0178	0.200	ug/L	25.0		99.1	80-120			
Duplicate (BJK0410-DUP1)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 22:48						
Chromium, Dissolved	52	0.875	0.260	0.500	ug/L		0.713			20.40	20	L
Lead, Dissolved	208	ND	0.0513	0.100	ug/L		ND					U
Arsenic, Dissolved	75a	7.29	0.0373	0.200	ug/L		7.19			1.31	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L		ND					U
Copper, Dissolved	63	ND	0.173	0.500	ug/L		ND					U
Nickel, Dissolved	60	0.913	0.0792	0.500	ug/L		0.873			4.48	20	
Zinc, Dissolved	66	ND	2.92	6.00	ug/L		ND					U
Duplicate (BJK0410-DUP2)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 22-Nov-2021 21:04						
Barium, Dissolved	135	1.01	0.114	0.500	ug/L		1.00			0.10	20	
Silver, Dissolved	107	ND	0.0220	0.200	ug/L		ND					U
Vanadium, Dissolved	51a	1.66	0.0556	0.200	ug/L		ND					
Cobalt, Dissolved	59	0.203	0.0178	0.200	ug/L		ND					
Matrix Spike (BJK0410-MS1)						Source: 21K0240-02 Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 22:52						
Chromium, Dissolved	52	22.2	0.260	0.500	ug/L	25.0	0.713	85.9	75-125			
Lead, Dissolved	208	25.1	0.0513	0.100	ug/L	25.0	ND	101	75-125			
Arsenic, Dissolved	75a	32.0	0.0373	0.200	ug/L	25.0	7.19	99.1	75-125			
Cadmium, Dissolved	111	23.5	0.0300	0.100	ug/L	25.0	ND	93.9	75-125			
Copper, Dissolved	63	25.3	0.173	0.500	ug/L	25.0	ND	101	75-125			
Nickel, Dissolved	60	26.4	0.0792	0.500	ug/L	25.0	0.873	102	75-125			
Zinc, Dissolved	66	73.6	2.92	6.00	ug/L	80.0	ND	92.1	75-125			

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


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0410 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJK0410-MS2)		Source: 21K0240-02		Prepared: 16-Nov-2021		Analyzed: 22-Nov-2021 21:09						
Barium, Dissolved	135	28.1	0.114	0.500	ug/L	25.0	1.00	108	75-125			
Silver, Dissolved	107	24.9	0.0220	0.200	ug/L	25.0	ND	99.8	75-125			
Vanadium, Dissolved	51a	22.7	0.0556	0.200	ug/L	25.0	ND	90.7	75-125			
Cobalt, Dissolved	59	26.0	0.0178	0.200	ug/L	25.0	ND	104	75-125			

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

Matrix Spike Dup (BJK0410-MSD1)		Source: 21K0240-02		Prepared: 16-Nov-2021		Analyzed: 16-Nov-2021 22:58						
Chromium, Dissolved	52	22.3	0.260	0.500	ug/L	25.0	0.713	86.3	75-125	0.45	20	
Lead, Dissolved	208	25.7	0.0513	0.100	ug/L	25.0	ND	103	75-125	2.40	20	
Arsenic, Dissolved	75a	31.3	0.0373	0.200	ug/L	25.0	7.19	96.5	75-125	2.03	20	
Cadmium, Dissolved	111	23.9	0.0300	0.100	ug/L	25.0	ND	95.5	75-125	1.68	20	
Copper, Dissolved	63	24.4	0.173	0.500	ug/L	25.0	ND	97.8	75-125	3.24	20	
Nickel, Dissolved	60	25.4	0.0792	0.500	ug/L	25.0	0.873	98.3	75-125	3.68	20	
Zinc, Dissolved	66	73.9	2.92	6.00	ug/L	80.0	ND	92.4	75-125	0.34	20	

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

Matrix Spike Dup (BJK0410-MSD2)		Source: 21K0240-02		Prepared: 16-Nov-2021		Analyzed: 22-Nov-2021 21:14						
Barium, Dissolved	135	27.5	0.114	0.500	ug/L	25.0	1.00	106	75-125	2.02	20	
Silver, Dissolved	107	23.9	0.0220	0.200	ug/L	25.0	ND	95.8	75-125	4.12	20	
Vanadium, Dissolved	51a	22.3	0.0556	0.200	ug/L	25.0	ND	89.2	75-125	1.66	20	
Cobalt, Dissolved	59	25.6	0.0178	0.200	ug/L	25.0	ND	102	75-125	1.39	20	

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


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 16:54

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0647 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0647-BLK1)						Prepared: 24-Nov-2021 Analyzed: 24-Nov-2021 12:50					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L							U
LCS (BJK0647-BS1)						Prepared: 24-Nov-2021 Analyzed: 24-Nov-2021 12:52					
Mercury, Dissolved	0.00167	0.000013	0.000100	mg/L	0.00200		83.6	80-120			
Duplicate (BJK0647-DUP1)						Source: 21K0240-10 Prepared: 24-Nov-2021 Analyzed: 24-Nov-2021 12:57					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJK0647-MS1)						Source: 21K0240-10 Prepared: 24-Nov-2021 Analyzed: 24-Nov-2021 12:59					
Mercury, Dissolved	0.000889	0.000013	0.000100	mg/L	0.00100	ND	88.9	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJK0647-MSD1)						Source: 21K0240-10 Prepared: 24-Nov-2021 Analyzed: 24-Nov-2021 13:06					
Mercury, Dissolved	0.000821	0.000013	0.000100	mg/L	0.00100	ND	82.1	75-125	7.97	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
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC


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Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE


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Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE


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m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE
1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE


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1,2-Dichloroethane

NELAP,WADOE

Benzene

NELAP,WADOE

EPA 8270E in Water

Phenol

NELAP,DoD-ELAP

bis(2-chloroethyl) ether

NELAP,DoD-ELAP

2-Chlorophenol

NELAP,DoD-ELAP

1,3-Dichlorobenzene

NELAP,DoD-ELAP

1,4-Dichlorobenzene

NELAP,DoD-ELAP

1,2-Dichlorobenzene

NELAP,DoD-ELAP

Benzyl Alcohol

NELAP,DoD-ELAP

2,2'-Oxybis(1-chloropropane)

NELAP,DoD-ELAP

2-Methylphenol

NELAP,DoD-ELAP

Hexachloroethane

NELAP,DoD-ELAP

N-Nitroso-di-n-Propylamine

NELAP,DoD-ELAP

4-Methylphenol

NELAP,DoD-ELAP

Nitrobenzene

NELAP,DoD-ELAP

Isophorone

NELAP,DoD-ELAP

2-Nitrophenol

NELAP,DoD-ELAP

2,4-Dimethylphenol

NELAP,DoD-ELAP

Bis(2-Chloroethoxy)methane

NELAP,DoD-ELAP

2,4-Dichlorophenol

NELAP,DoD-ELAP

1,2,4-Trichlorobenzene

NELAP,DoD-ELAP

Naphthalene

NELAP,DoD-ELAP

Benzoic acid

NELAP,DoD-ELAP

4-Chloroaniline

NELAP,DoD-ELAP

Hexachlorobutadiene

NELAP,DoD-ELAP

4-Chloro-3-Methylphenol

NELAP,DoD-ELAP

2-Methylnaphthalene

NELAP,DoD-ELAP

Hexachlorocyclopentadiene

NELAP,DoD-ELAP

2,4,6-Trichlorophenol

NELAP,DoD-ELAP

2,4,5-Trichlorophenol

NELAP,DoD-ELAP

2-Chloronaphthalene

NELAP,DoD-ELAP

2-Nitroaniline

NELAP,DoD-ELAP

Acenaphthylene

NELAP,DoD-ELAP

Dimethylphthalate

NELAP,DoD-ELAP

2,6-Dinitrotoluene

NELAP,DoD-ELAP

Acenaphthene

NELAP,DoD-ELAP

3-Nitroaniline

NELAP,DoD-ELAP

2,4-Dinitrophenol

NELAP,DoD-ELAP


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Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzo(a)fluoranthene, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP

EPA 8270E-SIM in Water

Naphthalene	ADEC,DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	ADEC,DoD-ELAP,NELAP
1-Methylnaphthalene	ADEC,DoD-ELAP,NELAP,WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC,DoD-ELAP,NELAP,WADOE


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Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP, NELAP, WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP, NELAP, WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP, NELAP, WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP, NELAP, WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP, NELAP, WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP, NELAP, WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP, NELAP, WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP, NELAP, WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP, NELAP, WADOE


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Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to $\pm$ RL instead of 20% RPD
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ($< 20\%$ RSD, $< 20\%$ drift or minimum RRF)
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

17 December 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q4

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.

Associated Work Order(s)
21K0245

Associated SDG ID(s)
N/A

Shelly Fishel

Digitally signed by Shelly
Fishel
Date: 2021.12.17
16:14:29 -08'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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.



Page:	1	of	1
Date:	11/2/21	Ice Present?	
No. of Coolers:	3	Cooler Temps:	4.8, 5.4, 4.5



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

Sample ID	Date	Time	Matrix	No. Containers	TPH	TPH	BTE	HVOC	MTB	PAH	SVOCs	SVOCs	PBB Ar	Metals	Hex	N.A.	Pb, Hg, Se, Ag, V, Zn	
MW-58-20211211	11/12	0934	GW	18		X	X	X		X				①		X	② As, Cr, Mn, Ni, Cd, Co, Cu, Pb, Hg, Se, Ag, Zn	
MW-75-20211211	11/12	1045	GW	13		X	X	X			X		X	①				
MW-36-20211211	11/12	1240	GW	18	X	X	X	X						②		X	③ Mn	
MW-30-20211211	11/12	1335	GW	18	X	X		X						③		X		
TB-4-20211211	11/12	1400	W	5			X	X										
																	Total Metals are not field filtered	
Comments/Special Instructions NAP = Nitrate, Nitrite, chloride, sulfate, sulfite, diss. ferrous iron, diss. manganese ion, methane, ethane, ethene.	Relinquished by: (Signature)		Received by: (Signature)		Relinquished by: (Signature)		Received by: (Signature)											
	Printed Name:		Printed Name:		Printed Name:		Printed Name:											
	Company:		Company:		Company:		Company:											
	Date & Time:		Date & Time:		Date & Time:		Date & Time:											
	11/12/2021	1500			11/12/21	1500												

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



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Project: Lower Duwamish Q4
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-58-20211211	21K0245-01	Water	12-Nov-2021 09:34	12-Nov-2021 15:00
MW-58-20211211	21K0245-02	Water	12-Nov-2021 09:34	12-Nov-2021 15:00
MW-75-20211211	21K0245-03	Water	12-Nov-2021 10:45	12-Nov-2021 15:00
MW-75-20211211	21K0245-04	Water	12-Nov-2021 10:45	12-Nov-2021 15:00
MW-36-20211211	21K0245-05	Water	12-Nov-2021 12:40	12-Nov-2021 15:00
MW-36-20211211	21K0245-06	Water	12-Nov-2021 12:40	12-Nov-2021 15:00
MW-30-20211211	21K0245-07	Water	12-Nov-2021 13:35	12-Nov-2021 15:00
MW-30-20211211	21K0245-08	Water	12-Nov-2021 13:35	12-Nov-2021 15:00
TB-4-20211211	21K0245-09	Water	12-Nov-2021 09:34	12-Nov-2021 15:00



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Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q4
Work Order: 21K0245

Sample receipt

Samples as listed on the preceding page were received 12-Nov-2021 15:00 under ARI work order 21K0245. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline by NWTPH-q (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.



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Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. 4-Chlorophenylphenyl ether, 4-Nitrophenol, Fluorene, Hexachlorocyclopentadiene and Pentachlorophenol which were out of control low and 2,4,6-Trichlorophenol, 2,4-Dinitrophenol, bis(2-ethylhexyl)phthalate, Butylbenzylphthalate, Fluoranthene and Pyrene and surrogate p-Terphenyl-d14 which were out of control high. All samples which contain analyte have been flagged with a "Q" qualifier. Hexachlorocyclopentadiene and Pentachlorophenol which were out of control low in the continuing calibration verification SJK0389-CCV1. 2,4-Dinitrophenol, 4-Nitrophenol, Benzoic Acid, Hexachlorocyclopentadiene and Pentachlorophenol which were out of control low in the low concentration calibration verification SJK0389-LCV1. 4,6-Dinitro-2-methylphenol, 4-Nitrophenol, Benzoic Acid and Pentachlorophenol which were out of control low in the low concentration calibration verification SJK0389-LCV2.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except as follows. Phenol-d5 which was out of control low in



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sample 21K0245-03 and the method blank BJK0383-BLK1. p-Terphenyl-d14 was out of control high in the initial calibration verification SJK0389-ICV1. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits except 4-Chloroaniline and Hexachlorocyclopentadiene percent recoveries were out of control low and have been flagged.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 210245-02 in Dissolved Metals batch BJK0635. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits except Dissolved Chromium which was out of control low in the matrix spike duplicate BJK0635-MSD1 and has been flagged. A post preparation spike was performed with passing percent recovery.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times except as follows. Sulfite hold time was exceeded upon sample receipt. Nitrate and Nitrite were initially analyzed in hold. However, due to analyst error eleven


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samples were analyzed between continuing calibration blanks SJK0180-CCB2 and SJK0180-CCB3. Original and reanalysis data have been reported to show initial run was attempted within hold time. Deviations have been "H" qualified.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0245-01 in Anions batch BJK0353, Ferrous Iron batch BJK0350 and Sulfite batch BJK0349. The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Total and Dissolved Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0245-02 in Dissolved Mercury batch BJK0578. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatile Gases - MEE by RSK175

The sample(s) were analyzed within the recommended holding times.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits except Propane which was out of control low in sample 21K0245-07 and the method blank BJK0434-DUP1. Deviations have been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Sample specific QC was performed in association with sample 21K0245-01 in batch BJK0434. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits.



WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0245-01 A	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	Pass (P)
21K0245-01 B	Small OJ, 500 mL, EDTA		
21K0245-01 C	HDPE NM, 500 mL		
21K0245-01 D	HDPE NM, 500 mL		
21K0245-01 E	Glass NM, Amber, 500 mL, HCl		
21K0245-01 F	Glass NM, Amber, 500 mL		
21K0245-01 G	Glass NM, Amber, 500 mL		
21K0245-01 H	Glass NM, Amber, 500 mL		
21K0245-01 I	Glass NM, Amber, 500 mL		
21K0245-01 J	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 K	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-02 A	HDPE NM, 500 mL	>2	Fail
21K0245-02 B	HDPE NM, 500 mL	>2	Fail
21K0245-03 A	Glass NM, Amber, 1000 mL		
21K0245-03 F	Glass NM, Amber, 1000 mL		
21K0245-03 G	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	P
21K0245-03 H	Glass NM, Amber, 500 mL		
21K0245-03 I	Glass NM, Amber, 500 mL		
21K0245-03 J	Glass NM, Amber, 500 mL		
21K0245-03 K	Glass NM, Amber, 500 mL		
21K0245-03 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-04 A	HDPE NM, 500 mL	>2	Fail
21K0245-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	P
21K0245-05 B	Small OJ, 500 mL, EDTA		
21K0245-05 C	HDPE NM, 500 mL		



WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-05 D	HDPE NM, 500 mL		
21K0245-05 E	Glass NM, Amber, 500 mL, HCL		
21K0245-05 F	Glass NM, Amber, 500 mL		
21K0245-05 G	Glass NM, Amber, 500 mL		
21K0245-05 H	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 I	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 J	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 K	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-06 A	HDPE NM, 500 mL	>2	Fail
21K0245-06 B	HDPE NM, 500 mL	>2	Fail
21K0245-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0245-07 B	Small OJ, 500 mL, EDTA		
21K0245-07 C	HDPE NM, 500 mL		
21K0245-07 D	HDPE NM, 500 mL		
21K0245-07 E	Glass NM, Amber, 500 mL, HCL		
21K0245-07 F	Glass NM, Amber, 500 mL		
21K0245-07 G	Glass NM, Amber, 500 mL		
21K0245-07 H	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 I	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 J	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 K	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-08 A	HDPE NM, 500 mL	>2	Fail
21K0245-08 B	HDPE NM, 500 mL	>2	Fail
21K0245-09 A	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0245-09 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0245-09 C	VOA Vial, Clear, 40 mL, HCL	bubble	



WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-09 D VOA Vial, Clear, 40 mL, HCL

bubble

21K0245-09 E VOA Vial, Clear, 40 mL, HCL

bubble

RB

Preservation Confirmed By

11/12/21

Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon + Wilson

Project Name: LDW

COC No(s): _____ NA

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

Assigned ARI Job No: 21K0245

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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 1500

4.8 5.4 4.5

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO-5009708

Cooler Accepted by: AP

Date: 11/12/21

Time: 1500

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

How were bottles sealed in plastic bags? _____

Individually Grouped Not

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 11/1/21

Were the sample(s) split by ARI? NA

YES

Date/Time: _____

Equipment: _____

Split by: _____

Samples Logged by: RB

Date: 11/12/21

Time: 1554

Labels checked by: _____

**** 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:

Trip blank labels include MTBE but no other samples are running that analysis.
Logged without MTBE based off COC.

By: RB

Date: 11/12/21



WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH		
21K0245-01 A	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	Pass	(P)
21K0245-01 B	Small OJ, 500 mL, EDTA			
21K0245-01 C	HDPE NM, 500 mL			
21K0245-01 D	HDPE NM, 500 mL			
21K0245-01 E	Glass NM, Amber, 500 mL, HCl			
21K0245-01 F	Glass NM, Amber, 500 mL			
21K0245-01 G	Glass NM, Amber, 500 mL			
21K0245-01 H	Glass NM, Amber, 500 mL			
21K0245-01 I	Glass NM, Amber, 500 mL			
21K0245-01 J	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 K	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-02 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0245-02 B	HDPE NM, 500 mL	>2	Fail	
21K0245-03 A	Glass NM, Amber, 1000 mL			
21K0245-03 F	Glass NM, Amber, 1000 mL			
21K0245-03 G	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	P	
21K0245-03 H	Glass NM, Amber, 500 mL			
21K0245-03 I	Glass NM, Amber, 500 mL			
21K0245-03 J	Glass NM, Amber, 500 mL			
21K0245-03 K	Glass NM, Amber, 500 mL			
21K0245-03 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-04 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0245-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	P	
21K0245-05 B	Small OJ, 500 mL, EDTA			
21K0245-05 C	HDPE NM, 500 mL			



WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-05 D	HDPE NM, 500 mL			
21K0245-05 E	Glass NM, Amber, 500 mL, HCL			
21K0245-05 F	Glass NM, Amber, 500 mL			
21K0245-05 G	Glass NM, Amber, 500 mL			
21K0245-05 H	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 I	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 J	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 K	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-06 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0245-06 B	HDPE NM, 500 mL	>2	Fail	
21K0245-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P	
21K0245-07 B	Small OJ, 500 mL, EDTA			
21K0245-07 C	HDPE NM, 500 mL			
21K0245-07 D	HDPE NM, 500 mL			
21K0245-07 E	Glass NM, Amber, 500 mL, HCL			
21K0245-07 F	Glass NM, Amber, 500 mL			
21K0245-07 G	Glass NM, Amber, 500 mL			
21K0245-07 H	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 I	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 J	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 K	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-08 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0245-08 B	HDPE NM, 500 mL	>2	Fail	
21K0245-09 A	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0245-09 B	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0245-09 C	VOA Vial, Clear, 40 mL, HCL	bubble		



WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-09 D VOA Vial, Clear, 40 mL, HCL

bubble

21K0245-09 E VOA Vial, Clear, 40 mL, HCL

bubble

Preservation Confirmed By

11/12/21

Date

① Filtered at 0.45 microns
& Preserved to pH 2.0
with 0.75ML conc. HNO₃
(510414) mm 11/12/21



Analytical Resources, LLC
Analytical Chemists and Consultants

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WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0245-01 A	HDPE NM, 500 mL, 1:1 HNO ₃	~2	Pass (P)
21K0245-01 B	Small OJ, 500 mL, EDTA		
21K0245-01 C	HDPE NM, 500 mL		
21K0245-01 D	HDPE NM, 500 mL		
21K0245-01 E	Glass NM, Amber, 500 mL, HCl		(1)
21K0245-01 F	Glass NM, Amber, 500 mL		
21K0245-01 G	Glass NM, Amber, 500 mL		
21K0245-01 H	Glass NM, Amber, 500 mL		
21K0245-01 I	Glass NM, Amber, 500 mL		
21K0245-01 J	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 K	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-01 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-02 A	HDPE NM, 500 mL	>2	Fail
21K0245-02 B	HDPE NM, 500 mL	>2	Fail
21K0245-03 A	Glass NM, Amber, 1000 mL		
21K0245-03 F	Glass NM, Amber, 1000 mL		
21K0245-03 G	HDPE NM, 500 mL, 1:1 HNO ₃	~2	P
21K0245-03 H	Glass NM, Amber, 500 mL		
21K0245-03 I	Glass NM, Amber, 500 mL		
21K0245-03 J	Glass NM, Amber, 500 mL		
21K0245-03 K	Glass NM, Amber, 500 mL		
21K0245-03 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-03 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-04 A	HDPE NM, 500 mL	>2	Fail
21K0245-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	~2	P
21K0245-05 B	Small OJ, 500 mL, EDTA		
21K0245-05 C	HDPE NM, 500 mL		

Reviewed By

Date

Page 1 of 3



Analytical Resources, LLC
Analytical Chemists and Consultants

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WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-I-12596-012

21K0245-05 D	HDPE NM, 500 mL		
21K0245-05 E	Glass NM, Amber, 500 mL, HCL		①
21K0245-05 F	Glass NM, Amber, 500 mL		
21K0245-05 G	Glass NM, Amber, 500 mL		
21K0245-05 H	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 I	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 J	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 K	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-05 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-06 A	HDPE NM, 500 mL	>2	Fail
21K0245-06 B	HDPE NM, 500 mL	>2	Fail
21K0245-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P
21K0245-07 B	Small OJ, 500 mL, EDTA		
21K0245-07 C	HDPE NM, 500 mL		
21K0245-07 D	HDPE NM, 500 mL		
21K0245-07 E	Glass NM, Amber, 500 mL, HCL		①
21K0245-07 F	Glass NM, Amber, 500 mL		
21K0245-07 G	Glass NM, Amber, 500 mL		
21K0245-07 H	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 I	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 J	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 K	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 L	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 M	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 N	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 O	VOA Vial, Clear, 40 mL, HCL		
21K0245-07 P	VOA Vial, Clear, 40 mL, HCL		
21K0245-08 A	HDPE NM, 500 mL	>2	Fail
21K0245-08 B	HDPE NM, 500 mL	>2	Fail
21K0245-09 A	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0245-09 B	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0245-09 C	VOA Vial, Clear, 40 mL, HCL	bubble	

Reviewed By

Date

Page 2 of 3



Analytical Resources, LLC
Analytical Chemists and Consultants

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WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-09 D VOA Vial, Clear, 40 mL, HCL

bubble

21K0245-09 E VOA Vial, Clear, 40 mL, HCL

bubble


Preservation Confirmed By

Date

11/12/21

① pH < 2
Significant head space
11/12/21 19:15 CLK

Reviewed By

Date

Page 3 of 3



Analytical Resources, LLC
Analytical Chemists and Consultants

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WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH		
21K0245-01 A	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	Pass	(P)
21K0245-01 B	Small OJ, 500 mL, EDTA			
21K0245-01 C	HDPE NM, 500 mL			
21K0245-01 D	HDPE NM, 500 mL			
21K0245-01 E	Glass NM, Amber, 500 mL, HCl			
21K0245-01 F	Glass NM, Amber, 500 mL			
21K0245-01 G	Glass NM, Amber, 500 mL			
21K0245-01 H	Glass NM, Amber, 500 mL			
21K0245-01 I	Glass NM, Amber, 500 mL			
21K0245-01 J	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 K	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-01 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-02 A	HDPE NM, 500 mL	>2	Fail	①
21K0245-02 B	HDPE NM, 500 mL	>2	Fail	
21K0245-03 A	Glass NM, Amber, 1000 mL			
21K0245-03 F	Glass NM, Amber, 1000 mL			
21K0245-03 G	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	P	
21K0245-03 H	Glass NM, Amber, 500 mL			
21K0245-03 I	Glass NM, Amber, 500 mL			
21K0245-03 J	Glass NM, Amber, 500 mL			
21K0245-03 K	Glass NM, Amber, 500 mL			
21K0245-03 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-03 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-04 A	HDPE NM, 500 mL	>2	Fail	①
21K0245-05 A	HDPE NM, 500 mL, 1:1 HNO ₃	✓2	P	
21K0245-05 B	Small OJ, 500 mL, EDTA			
21K0245-05 C	HDPE NM, 500 mL			

Reviewed By

Date

Page 1 of 3



Analytical Resources, LLC
Analytical Chemists and Consultants

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WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-05 D	HDPE NM, 500 mL			
21K0245-05 E	Glass NM, Amber, 500 mL, HCl			
21K0245-05 F	Glass NM, Amber, 500 mL			
21K0245-05 G	Glass NM, Amber, 500 mL			
21K0245-05 H	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 I	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 J	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 K	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-05 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-06 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0245-06 B	HDPE NM, 500 mL	>2	Fail	
21K0245-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2	P	
21K0245-07 B	Small OJ, 500 mL, EDTA			
21K0245-07 C	HDPE NM, 500 mL			
21K0245-07 D	HDPE NM, 500 mL			
21K0245-07 E	Glass NM, Amber, 500 mL, HCl			
21K0245-07 F	Glass NM, Amber, 500 mL			
21K0245-07 G	Glass NM, Amber, 500 mL			
21K0245-07 H	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 I	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 J	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 K	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 L	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 M	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 N	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 O	VOA Vial, Clear, 40 mL, HCL			
21K0245-07 P	VOA Vial, Clear, 40 mL, HCL			
21K0245-08 A	HDPE NM, 500 mL	>2	Fail	(1)
21K0245-08 B	HDPE NM, 500 mL	>2	Fail	
21K0245-09 A	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0245-09 B	VOA Vial, Clear, 40 mL, HCL	bubble		
21K0245-09 C	VOA Vial, Clear, 40 mL, HCL	bubble		

Reviewed By

Date

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Analytical Resources, LLC
Analytical Chemists and Consultants

Printed: 11/12/2021 4:26:59PM

WORK ORDER

21K0245

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q3

Project Number: 21-1-12596-012

21K0245-09 D VOA Vial, Clear, 40 mL, HCL

bubble

21K0245-09 E VOA Vial, Clear, 40 mL, HCL

bubble

Preservation Confirmed By RB

Date

11/12/21

① Filtered w/ 0.45 microns
preserved to 52pg
with 0.75 mL conc. HNO₃
(5010414) M M 11/15/21

Reviewed By

Date

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 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/12/2021 09:34

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 17:04

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-01 K

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	96.3	ug/L	E
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	12.4	ug/L	
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	20.6	ug/L	
m,p-Xylene	179601-23-1	1	0.14	0.40	23.0	ug/L	
o-Xylene	95-47-6	1	0.08	0.20	1.28	ug/L	
Xylenes, total	1330-20-7	1	0.22	0.60	24.3	ug/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>				<i>80-129 %</i>	<i>172</i>	<i>%</i>	<i>*</i>
<i>Surrogate: Toluene-d8</i>				<i>80-120 %</i>	<i>110</i>	<i>%</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>				<i>80-120 %</i>	<i>110</i>	<i>%</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				<i>80-120 %</i>	<i>99.0</i>	<i>%</i>	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/12/2021 09:34

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 13:01

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-01 J

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	120	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	105	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	101	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Dissolved Gases

Method: EPA RSK-175

Sampled: 11/12/2021 09:34

Instrument: FID6 Analyst: LH

Analyzed: 11/17/2021 14:40

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-01 N

Preparation Batch: BJK0434

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	5060	ug/L	
Ethane	74-84-0	1	1.23	4.60	ug/L	
Ethene	74-85-1	1	1.14	ND	ug/L	U
Acetylene	74-86-2	1	1.06	ND	ug/L	U
<i>Surrogate: Propane</i>			72-122 %	73.8	%	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211

21K0245-01 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/12/2021 09:34

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 17:40

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0380 Prepared: 11/18/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0245-01 F 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0279 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0245-01 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.288	ug/L	
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.019	ug/L	
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.321	ug/L	
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.017	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.013	ug/L	
Phenanthrene	85-01-8	1	0.001	0.010	0.007	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.002	ug/L	J
Fluoranthene	206-44-0	1	0.002	0.010	0.002	ug/L	J
Pyrene	129-00-0	1	0.001	0.010	0.002	ug/L	J
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	61.8	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	71.3	%	
Surrogate: Fluoranthene-d10				57-120 %	95.4	%	


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/12/2021 09:34

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 21:31

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0245-01 H 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.200	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	101	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/12/2021 09:34

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:23

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-01 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	28.8	ug/L	
Chromium	7440-47-3	2	0.520	1.00	1.04	ug/L	D
Lead	7439-92-1	1	0.0513	0.100	0.0700	ug/L	J
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	2	0.111	0.400	7.72	ug/L	D


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/12/2021 09:34

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:23

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-01 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0373	0.200	68.2	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.642	ug/L	
Copper	7440-50-8	1	0.173	0.500	0.255	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	0.500	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211

21K0245-01 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/12/2021 09:34

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:37

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0245-01 A

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000037	mg/L	J


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01 (Water)
Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 09:34

Instrument: IC930 Analyst: BF

Analyzed: 11/13/2021 03:05

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-01 C

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211

21K0245-01 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 11/12/2021 09:34

Instrument: UV1800-2 Analyst: CKI

Analyzed: 11/12/2021 18:47

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-01 A

Preparation Batch: BJK0350

Sample Size: 5 mL

Prepared: 11/12/2021

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		50	2.00	2.00	84.7	mg/L	D



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211

21K0245-01 (Water)

Wet Chemistry

Method: SM 4500-SO3 B-00

Sampled: 11/12/2021 09:34

Instrument: N/A Analyst: UW

Analyzed: 11/12/2021 17:03

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-01

Preparation Batch: BJK0349

Sample Size: 50 mL

Prepared: 11/12/2021

Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfite	14265-45-3	1	1.4	1.4	ND	mg/L	H, U



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211
21K0245-01RE1 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/12/2021 09:34

Instrument: NT3 Analyst: PKC

Analyzed: 11/17/2021 17:47

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BJK0451
Prepared: 11/17/2021

Sample Size: 2 mL
Final Volume: 10 mL

Extract ID: 21K0245-01RE1 P

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.41	1.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.38	1.00	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.35	1.00	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.41	1.00	ND	ug/L	U
Benzene	71-43-2	1	0.27	1.00	105	ug/L	
Trichloroethene	79-01-6	1	0.35	1.00	ND	ug/L	U
Toluene	108-88-3	1	0.24	1.00	11.6	ug/L	
Tetrachloroethene	127-18-4	1	0.46	1.00	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.25	1.00	28.2	ug/L	
m,p-Xylene	179601-23-1	1	0.72	2.00	21.4	ug/L	
o-Xylene	95-47-6	1	0.39	1.00	1.28	ug/L	
Xylenes, total	1330-20-7	1	1.09	3.00	22.6	ug/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>					<i>80-129 %</i>	<i>112 %</i>	
<i>Surrogate: Toluene-d8</i>					<i>80-120 %</i>	<i>105 %</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>					<i>80-120 %</i>	<i>104 %</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					<i>80-120 %</i>	<i>101 %</i>	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01RE1 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/12/2021 09:34

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 23:22

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0245-01RE1 A 02
	Preparation Batch: BJK0507	Sample Size: 25 mL
	Prepared: 11/18/2021	Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Iron	7439-89-6	20	364	720	91000	ug/L	D
Manganese	7439-96-5	20	2.84	10.0	1600	ug/L	D


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-01RE1 (Water)
Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 09:34

Instrument: IC930 Analyst: BF

Analyzed: 11/20/2021 00:56

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-01RE1 C

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211
21K0245-01RE3 (Water)

Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 09:34

Instrument: IC930 Analyst: BF

Analyzed: 11/22/2021 21:47

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-01RE3 C

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	10	1.00	1.00	46.7	mg/L	D



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211
21K0245-01RE4 (Water)

Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 09:34

Instrument: IC930 Analyst: BF

Analyzed: 12/03/2021 04:16

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-01RE4 A

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	4.96	mg/L	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-02 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/12/2021 09:34

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 18:17

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0245-02 A 02

Preparation Batch: BJK0635

Sample Size: 25 mL

Filtration Batch: BJK0396

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection		Reporting		Result	Units	Notes
			Limit	Limit	Limit	Limit			
Barium, Dissolved	7440-39-3	1	0.114	0.500			3.30	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500			ND	ug/L	U
Iron, Dissolved	7439-89-6	20	364	720			41700	ug/L	D
Lead, Dissolved	7439-92-1	1	0.0513	0.100			ND	ug/L	U
Manganese, Dissolved	7439-96-5	20	2.84	10.0			1500	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200			ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200			0.251	ug/L	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-58-20211211
21K0245-02 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/12/2021 09:34

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 18:17

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0245-02 A 02

Preparation Batch: BJK0635

Sample Size: 25 mL

Filtration Batch: BJK0396

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	6.95	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.454	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.366	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-58-20211211

21K0245-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/12/2021 09:34

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 14:45

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0245-02 A 01

Preparation Batch: BJK0578

Sample Size: 20 mL

Filtration Batch: BJK0396

Prepared: 11/22/2021

Final Volume: 20 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-75-20211211
21K0245-03 (Water)
Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/12/2021 10:45

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 17:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-03 O

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	0.09	ug/L	J
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	93.7	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	105	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	98.3	%	


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Reported:
 17-Dec-2021 15:29

MW-75-20211211
21K0245-03 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/12/2021 10:45

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 13:22

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-03 P

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	24.1	ng/L	
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.5	%	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-75-20211211

21K0245-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/12/2021 10:45

Instrument: NT10 Analyst: VTS

Analyzed: 11/28/2021 02:32

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BJK0383
Prepared: 11/18/2021

Sample Size: 1000 mL
Final Volume: 1 mL

Extract ID: 21K0245-03 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	0.01	0.2	ND	ug/L	U
bis(2-chloroethyl) ether	111-44-4	1	0.03	0.2	ND	ug/L	U
2-Chlorophenol	95-57-8	1	0.03	0.2	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.03	0.2	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
Benzyl Alcohol	100-51-6	1	0.02	0.2	ND	ug/L	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	0.03	0.2	ND	ug/L	U
2-Methylphenol	95-48-7	1	0.03	0.2	ND	ug/L	U
Hexachloroethane	67-72-1	1	0.04	0.2	ND	ug/L	U
N-Nitroso-di-n-Propylamine	621-64-7	1	0.04	0.2	ND	ug/L	U
4-Methylphenol	106-44-5	1	0.03	0.2	ND	ug/L	U
Nitrobenzene	98-95-3	1	0.03	0.2	ND	ug/L	U
Isophorone	78-59-1	1	0.03	0.2	ND	ug/L	U
2-Nitrophenol	88-75-5	1	0.04	1.0	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Bis(2-Chloroethoxy)methane	111-91-1	1	0.03	0.2	ND	ug/L	U
2,4-Dichlorophenol	120-83-2	1	0.1	1.0	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.03	0.2	ND	ug/L	U
Naphthalene	91-20-3	1	0.03	0.2	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
4-Chloroaniline	106-47-8	1	0.04	1.0	ND	ug/L	U
Hexachlorobutadiene	87-68-3	1	0.04	0.2	ND	ug/L	U
4-Chloro-3-Methylphenol	59-50-7	1	0.1	1.0	ND	ug/L	U
2-Methylnaphthalene	91-57-6	1	0.03	0.2	ND	ug/L	U
Hexachlorocyclopentadiene	77-47-4	1	0.1	1.0	ND	ug/L	U
2,4,6-Trichlorophenol	88-06-2	1	0.2	1.0	ND	ug/L	U
2,4,5-Trichlorophenol	95-95-4	1	0.1	1.0	ND	ug/L	U
2-Chloronaphthalene	91-58-7	1	0.03	0.2	ND	ug/L	U
2-Nitroaniline	88-74-4	1	0.2	1.0	ND	ug/L	U
Acenaphthylene	208-96-8	1	0.02	0.2	ND	ug/L	U
Dimethylphthalate	131-11-3	1	0.04	0.2	ND	ug/L	U
2,6-Dinitrotoluene	606-20-2	1	0.2	1.0	ND	ug/L	U
Acenaphthene	83-32-9	1	0.03	0.2	ND	ug/L	U



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-75-20211211

21K0245-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/12/2021 10:45

Instrument: NT10 Analyst: VTS

Analyzed: 11/28/2021 02:32

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
3-Nitroaniline	99-09-2	1	0.2	1.0	ND	ug/L	U
2,4-Dinitrophenol	51-28-5	1	0.2	2.0	ND	ug/L	U
Dibenzofuran	132-64-9	1	0.02	0.2	ND	ug/L	U
4-Nitrophenol	100-02-7	1	0.06	1.0	ND	ug/L	U
2,4-Dinitrotoluene	121-14-2	1	0.1	1.0	ND	ug/L	U
Fluorene	86-73-7	1	0.02	0.2	ND	ug/L	U
4-Chlorophenylphenyl ether	7005-72-3	1	0.02	0.2	ND	ug/L	U
Diethyl phthalate	84-66-2	1	0.06	0.2	0.1	ug/L	J
4-Nitroaniline	100-01-6	1	0.2	1.0	ND	ug/L	U
4,6-Dinitro-2-methylphenol	534-52-1	1	0.4	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
4-Bromophenyl phenyl ether	101-55-3	1	0.02	0.2	ND	ug/L	U
Hexachlorobenzene	118-74-1	1	0.04	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Phenanthrene	85-01-8	1	0.02	0.2	ND	ug/L	U
Anthracene	120-12-7	1	0.03	0.2	ND	ug/L	U
Carbazole	86-74-8	1	0.04	0.2	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Fluoranthene	206-44-0	1	0.03	0.2	ND	ug/L	U
Pyrene	129-00-0	1	0.03	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.04	0.2	ND	ug/L	U
3,3'-Dichlorobenzidine	91-94-1	1	0.3	1.0	ND	ug/L	U
Chrysene	218-01-9	1	0.04	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U
Di-n-Octylphthalate	117-84-0	1	0.05	0.2	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.08	0.4	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.05	0.2	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.06	0.2	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.07	0.2	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.04	0.2	ND	ug/L	U
1-Methylnaphthalene	90-12-0	1	0.03	0.2	ND	ug/L	U
Surrogate: 2-Fluorophenol					30-160 %	36.1 %	
Surrogate: Phenol-d5					30-160 %	23.0 %	*
Surrogate: 2-Chlorophenol-d4					30-160 %	69.6 %	
Surrogate: 1,2-Dichlorobenzene-d4					30-160 %	52.4 %	
Surrogate: Nitrobenzene-d5					30-160 %	68.1 %	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-75-20211211

21K0245-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/12/2021 10:45

Instrument: NT10 Analyst: VTS

Analyzed: 11/28/2021 02:32

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: 2-Fluorobiphenyl		30-160 %	70.4	%	
Surrogate: 2,4,6-Tribromophenol		30-160 %	78.7	%	
Surrogate: p-Terphenyl-d14		30-160 %	98.5	%	Q


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Reported:
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MW-75-20211211
21K0245-03 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/12/2021 10:45

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 21:51

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0381
 Prepared: 11/17/2021

 Sample Size: 500 mL
 Final Volume: 1 mL

Extract ID: 21K0245-03 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	92.9	%	



Analytical Report

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Project: Lower Duwamish Q4
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Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-75-20211211

21K0245-03 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 11/12/2021 10:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/27/2021 20:53

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0382 Prepared: 11/18/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0245-03 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0297 Cleaned: 27-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0245-03 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0299 Cleaned: 26-Nov-2021	Initial Volume: 500 uL Final Volume: 500 uL	Extract ID: 21K0245-03 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0298 Cleaned: 27-Nov-2021	Initial Volume: 500 uL Final Volume: 500 uL	Extract ID: 21K0245-03 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				29-120 %	83.9	%	
Surrogate: Tetrachlorometaxylene				32-120 %	74.8	%	
Surrogate: Decachlorobiphenyl [2C]				29-120 %	91.7	%	
Surrogate: Tetrachlorometaxylene [2C]				32-120 %	75.4	%	


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Reported:
 17-Dec-2021 15:29

MW-75-20211211
21K0245-03 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/12/2021 10:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:28

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-03 G 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	7.80	ug/L	
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	7880	ug/L	
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	10	1.42	5.00	585	ug/L	D
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	0.736	ug/L	


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Reported:
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MW-75-20211211
21K0245-03 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/12/2021 10:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:28

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-03 G 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	0.490	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.995	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.15	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	9.33	ug/L	
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-75-20211211

21K0245-03 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/12/2021 10:45

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:40

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0245-03 G

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000029	mg/L	J


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-75-20211211
21K0245-04 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/12/2021 10:45

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 18:04

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0245-04 A 02

Preparation Batch: BJK0635

Sample Size: 25 mL

Filtration Batch: BJK0396

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium, Dissolved	7440-39-3	1	0.114	0.500	4.64	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron, Dissolved	7439-89-6	1	18.2	36.0	94.3	ug/L	
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	10	1.42	5.00	582	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	0.187	ug/L	J


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-75-20211211
21K0245-04 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/12/2021 10:45

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 18:04

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0245-04 A 02

Preparation Batch: BJK0635

Sample Size: 25 mL

Filtration Batch: BJK0396

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	0.233	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.914	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	0.902	ug/L	
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	8.37	ug/L	
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
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MW-75-20211211

21K0245-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/12/2021 10:45

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 15:16

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0245-04 A 01

Preparation Batch: BJK0578

Sample Size: 20 mL

Filtration Batch: BJK0396

Prepared: 11/22/2021

Final Volume: 20 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
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MW-36-20211211

21K0245-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/12/2021 12:40

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 17:54

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-05 J

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	92.0	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	104	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	103	%	



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Project: Lower Duwamish Q4
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Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-36-20211211

21K0245-05 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/12/2021 12:40

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 17:54

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-05 J

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	104	%	


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 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/12/2021 12:40

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 13:43

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-05 I

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	106	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	95.1	%	


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Reported:
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MW-36-20211211
21K0245-05 (Water)
Dissolved Gases

Method: EPA RSK-175

Sampled: 11/12/2021 12:40

Instrument: FID6 Analyst: LH

Analyzed: 11/17/2021 15:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-05 L

Preparation Batch: BJK0434

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	7580	ug/L	
Ethane	74-84-0	1	1.23	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Acetylene	74-86-2	1	1.06	ND	ug/L	U
<i>Surrogate: Propane</i>			72-122 %	80.5	%	


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Reported:
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MW-36-20211211
21K0245-05 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/12/2021 12:40

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 22:10

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0245-05 F 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	1.46	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	0.284	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	112	%	


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 Project: Lower Duwamish Q4
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 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/12/2021 12:40

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 22:03

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-05 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Chromium	7440-47-3	2	0.520	1.00	1.11	ug/L	D
Lead	7439-92-1	1	0.0513	0.100	0.0800	ug/L	J
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/12/2021 12:40

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 00:35

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-05 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	54.9	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.182	ug/L	J
Copper	7440-50-8	1	0.173	0.500	0.253	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	0.897	ug/L	
Selenium	7782-49-2	1	0.179	0.500	0.276	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U



Analytical Resources, LLC
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Analytical Report

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Project: Lower Duwamish Q4
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Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-36-20211211

21K0245-05 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/12/2021 12:40

Instrument: HYDRA Analyst: ML

Analyzed: 11/19/2021 14:42

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0245-05 A

Preparation Batch: BJK0411

Sample Size: 20 mL

Prepared: 11/16/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	0.000032	mg/L	J


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 Project: Lower Duwamish Q4
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 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05 (Water)
Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 12:40

Instrument: IC930 Analyst: BF

Analyzed: 11/13/2021 04:05

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-05 A

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U



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Analytical Report

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Project: Lower Duwamish Q4
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Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-36-20211211

21K0245-05 (Water)

Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 11/12/2021 12:40

Instrument: UV1800-2 Analyst: CKI

Analyzed: 11/12/2021 18:50

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-05 B

Preparation Batch: BJK0350

Sample Size: 5 mL

Prepared: 11/12/2021

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		50	2.00	2.00	32.6	mg/L	D



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Analytical Report

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Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-36-20211211

21K0245-05 (Water)

Wet Chemistry

Method: SM 4500-SO3 B-00
Instrument: N/A Analyst: UW

Sampled: 11/12/2021 12:40
Analyzed: 11/12/2021 17:03

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: No Prep Wet Chem	Sample Size: 50 mL	Extract ID: 21K0245-05
	Preparation Batch: BJK0349	Final Volume: 50 mL	
	Prepared: 11/12/2021		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfite	14265-45-3	1	1.4	1.4	ND	mg/L	H, U


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 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05RE1 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/12/2021 12:40

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 22:07

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0507 Sample Size: 25 mL
 Prepared: 11/18/2021 Final Volume: 25 mL

Extract ID: 21K0245-05RE1 A 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	20	2.84	10.0	3060	ug/L	D


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05RE1 (Water)
Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 12:40

Instrument: IC930 Analyst: BF

Analyzed: 11/20/2021 04:15

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-05RE1 C

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	4.85	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	H, U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	H, U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-05RE2 (Water)
Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 12:40

Instrument: IC930 Analyst: BF

Analyzed: 12/03/2021 05:16

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-05RE2 A

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	ND	mg/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-36-20211211
21K0245-06 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/12/2021 12:40

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 18:08

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0245-06 A 02

Preparation Batch: BJK0635

Sample Size: 25 mL

Filtration Batch: BJK0396

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Chromium, Dissolved	7440-47-3	1	0.260	0.500	0.269	ug/L	J
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese, Dissolved	7439-96-5	50	7.10	25.0	2890	ug/L	D
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U


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Reported:
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MW-36-20211211
21K0245-06 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/12/2021 12:40

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 18:08

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0245-06 A 02
	Preparation Batch: BJK0635	Filtration Batch: BJK0396
	Prepared: 11/23/2021	Filtration Date: 11/15/2021 15:36
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	11.3	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.132	ug/L	J
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.473	ug/L	J
Selenium, Dissolved	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc, Dissolved	7440-66-6	1	2.92	6.00	ND	ug/L	U



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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-36-20211211

21K0245-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/12/2021 12:40

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 15:18

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0245-06 A 01

Preparation Batch: BJK0578

Sample Size: 20 mL

Filtration Batch: BJK0396

Prepared: 11/22/2021

Final Volume: 20 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-30-20211211

21K0245-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/12/2021 13:35

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 18:19

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-07 L

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	94.8	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	104	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	100	%	



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-30-20211211

21K0245-07 (Water)

Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/12/2021 13:35

Instrument: NT3 Analyst: PKC

Analyzed: 11/16/2021 18:19

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-07 L

Preparation Batch: BJK0419

Sample Size: 10 mL

Prepared: 11/16/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	104	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-30-20211211
21K0245-07 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/12/2021 13:35

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 14:04

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-07 K

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	108	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.5	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	94.4	%	


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

MW-30-20211211
21K0245-07 (Water)
Dissolved Gases

Method: EPA RSK-175

Sampled: 11/12/2021 13:35

Instrument: FID6 Analyst: LH

Analyzed: 11/17/2021 15:52

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-07 J

Preparation Batch: BJK0434

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Methane	74-82-8	1	0.65	1280	ug/L	
Ethane	74-84-0	1	1.23	ND	ug/L	U
Ethene	74-85-1	1	1.14	ND	ug/L	U
Acetylene	74-86-2	1	1.06	ND	ug/L	U
<i>Surrogate: Propane</i>			72-122 %	67.6	%	*


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Reported:
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MW-30-20211211
21K0245-07 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/12/2021 13:35

Instrument: FID4 Analyst: TWC

Analyzed: 11/22/2021 22:30

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0245-07 F 01

Preparation Batch: BJK0381

Sample Size: 500 mL

Prepared: 11/17/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	1.48	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	0.782	mg/L	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			50-150 %	108	%	



Analytical Resources, LLC
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Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-30-20211211

21K0245-07 (Water)

Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/12/2021 13:35

Instrument: ICPMS1 Analyst: SKD

Analyzed: 11/24/2021 23:13

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO₃ matrix

Extract ID: 21K0245-07 A 01

Preparation Batch: BJK0507

Sample Size: 25 mL

Prepared: 11/18/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	10	1.42	5.00	974	ug/L	D


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Reported:
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MW-30-20211211
21K0245-07 (Water)
Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 13:35

Instrument: IC930 Analyst: BF

Analyzed: 11/13/2021 05:30

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-07 C

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	7.04	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-30-20211211
21K0245-07 (Water)
Wet Chemistry

Method: SM 3500-Fe B-97

Sampled: 11/12/2021 13:35

Instrument: UV1800-2 Analyst: CKI

Analyzed: 11/12/2021 18:51

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-07 B

Preparation Batch: BJK0350

Sample Size: 5 mL

Prepared: 11/12/2021

Final Volume: 5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ferrous Iron		50	2.00	2.00	40.2	mg/L	D



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-30-20211211

21K0245-07 (Water)

Wet Chemistry

Method: SM 4500-SO3 B-00
Instrument: N/A Analyst: UW

Sampled: 11/12/2021 13:35
Analyzed: 11/12/2021 17:03

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BJK0349
Prepared: 11/12/2021

Sample Size: 50 mL
Final Volume: 50 mL

Extract ID: 21K0245-07

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfite	14265-45-3	1	1.4	1.4	ND	mg/L	H, U



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Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

MW-30-20211211
21K0245-07RE2 (Water)

Wet Chemistry

Method: EPA 300.0

Sampled: 11/12/2021 13:35

Instrument: IC930 Analyst: BF

Analyzed: 12/03/2021 06:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 21K0245-07RE2 A

Preparation Batch: BJK0353

Sample Size: 10 mL

Prepared: 11/12/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	20	2.00	2.00	55.2	mg/L	D


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-30-20211211
21K0245-08 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/12/2021 13:35

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/29/2021 21:23

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0245-08 A 02

Preparation Batch: BJK0635

Sample Size: 25 mL

Filtration Batch: BJK0396

Prepared: 11/23/2021

Final Volume: 25 mL

Filtration Date: 11/15/2021 15:36

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	10	1.42	5.00	947	ug/L	D



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

TB-4-20211211
21K0245-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/12/2021 09:34

Instrument: NT3 Analyst: PKC

Analyzed: 11/15/2021 12:16

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BJK0372
Prepared: 11/15/2021

Sample Size: 10 mL
Final Volume: 10 mL

Extract ID: 21K0245-09 E

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	96.4	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	105	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	102	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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TB-4-20211211
21K0245-09 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/12/2021 09:34

Instrument: NT16 Analyst: KOTT

Analyzed: 11/19/2021 11:36

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0245-09 C

Preparation Batch: BJK0498

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				75-125 %	96.0	%	



Analytical Report

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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0372 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0372-BLK1)						Prepared: 15-Nov-2021 Analyzed: 15-Nov-2021 11:51					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.03			ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	5.23			ug/L	5.00		105	80-120			
Surrogate: 4-Bromofluorobenzene	5.18			ug/L	5.00		104	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.85			ug/L	5.00		97.0	80-120			
LCS (BJK0372-BS1)						Prepared: 15-Nov-2021 Analyzed: 15-Nov-2021 10:10					
Vinyl Chloride	8.82	0.08	0.20	ug/L	10.0		88.2	66-133			
1,1-Dichloroethene	9.11	0.08	0.20	ug/L	10.0		91.1	69-135			
trans-1,2-Dichloroethene	9.50	0.07	0.20	ug/L	10.0		95.0	78-128			
cis-1,2-Dichloroethene	9.44	0.08	0.20	ug/L	10.0		94.4	80-121			
Benzene	10.4	0.05	0.20	ug/L	10.0		104	80-120			
Trichloroethene	10.7	0.07	0.20	ug/L	10.0		107	80-120			
Toluene	10.9	0.05	0.20	ug/L	10.0		109	80-120			
Tetrachloroethene	11.1	0.09	0.20	ug/L	10.0		111	80-120			
Ethylbenzene	10.4	0.05	0.20	ug/L	10.0		104	80-120			
m,p-Xylene	21.4	0.14	0.40	ug/L	20.0		107	80-121			
o-Xylene	10.6	0.08	0.20	ug/L	10.0		106	80-121			
Xylenes, total	32.0	0.22	0.60	ug/L	30.0		107	76-127			
Surrogate: 1,2-Dichloroethane-d4	4.69			ug/L	5.00		93.8	80-129			
Surrogate: Toluene-d8	5.21			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	5.35			ug/L	5.00		107	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.91			ug/L	5.00		98.3	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0372 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0372-BSD1)						Prepared: 15-Nov-2021 Analyzed: 15-Nov-2021 11:00					
Vinyl Chloride	8.99	0.08	0.20	ug/L	10.0		89.9	66-133	1.89	30	
1,1-Dichloroethene	9.11	0.08	0.20	ug/L	10.0		91.1	69-135	0.03	30	
trans-1,2-Dichloroethene	9.37	0.07	0.20	ug/L	10.0		93.7	78-128	1.35	30	
cis-1,2-Dichloroethene	9.84	0.08	0.20	ug/L	10.0		98.4	80-121	4.15	30	
Benzene	10.4	0.05	0.20	ug/L	10.0		104	80-120	0.07	30	
Trichloroethene	10.6	0.07	0.20	ug/L	10.0		106	80-120	0.95	30	
Toluene	10.7	0.05	0.20	ug/L	10.0		107	80-120	1.35	30	
Tetrachloroethene	11.1	0.09	0.20	ug/L	10.0		111	80-120	0.05	30	
Ethylbenzene	10.5	0.05	0.20	ug/L	10.0		105	80-120	1.17	30	
m,p-Xylene	21.2	0.14	0.40	ug/L	20.0		106	80-121	0.85	30	
o-Xylene	10.5	0.08	0.20	ug/L	10.0		105	80-121	0.85	30	
Xylenes, total	31.8	0.22	0.60	ug/L	30.0		106	76-127	0.85	30	
Surrogate: 1,2-Dichloroethane-d4	5.06			ug/L	5.00		101	80-129			
Surrogate: Toluene-d8	5.20			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	5.41			ug/L	5.00		108	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.09			ug/L	5.00		102	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0419 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0419-BLK1)		Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 14:07								
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	5.13		ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	5.39		ug/L	5.00		108	80-120			
Blank (BJK0419-BLK2)		Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 14:07								
Vinyl Chloride	ND	0.08	0.20	ug/L						U
1,1-Dichloroethene	ND	0.08	0.20	ug/L						U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L						U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L						U
Benzene	ND	0.05	0.20	ug/L						U
Trichloroethene	ND	0.07	0.20	ug/L						U
Toluene	ND	0.05	0.20	ug/L						U
Tetrachloroethene	ND	0.09	0.20	ug/L						U
Ethylbenzene	ND	0.05	0.20	ug/L						U
m,p-Xylene	ND	0.14	0.40	ug/L						U
o-Xylene	ND	0.08	0.20	ug/L						U
Xylenes, total	ND	0.22	0.60	ug/L						U
Surrogate: 1,2-Dichloroethane-d4	4.89		ug/L	5.00		97.7	80-129			
Surrogate: Toluene-d8	5.13		ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	5.39		ug/L	5.00		108	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.84		ug/L	5.00		96.8	80-120			
LCS (BJK0419-BS1)		Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 12:00								
Gasoline Range Organics (Tol-Nap)	962	100	ug/L	1000		96.2	72-128			
Surrogate: Toluene-d8	5.15		ug/L	5.00		103	80-120			
Surrogate: 4-Bromofluorobenzene	5.14		ug/L	5.00		103	80-120			
LCS (BJK0419-BS2)		Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 12:26								
Vinyl Chloride	9.27	0.08	0.20	ug/L	10.0	92.7	66-133			
1,1-Dichloroethene	9.14	0.08	0.20	ug/L	10.0	91.4	69-135			
trans-1,2-Dichloroethene	9.41	0.07	0.20	ug/L	10.0	94.1	78-128			
cis-1,2-Dichloroethene	9.55	0.08	0.20	ug/L	10.0	95.5	80-121			
Benzene	10.1	0.05	0.20	ug/L	10.0	101	80-120			
Trichloroethene	10.1	0.07	0.20	ug/L	10.0	101	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0419 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0419-BS2)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 12:26					
Toluene	10.2	0.05	0.20	ug/L	10.0		102	80-120			
Tetrachloroethene	10.5	0.09	0.20	ug/L	10.0		105	80-120			
Ethylbenzene	9.90	0.05	0.20	ug/L	10.0		99.0	80-120			
m,p-Xylene	20.7	0.14	0.40	ug/L	20.0		103	80-121			
o-Xylene	10.1	0.08	0.20	ug/L	10.0		101	80-121			
Xylenes, total	30.7	0.22	0.60	ug/L	30.0		102	76-127			
Surrogate: 1,2-Dichloroethane-d4	4.66			ug/L	5.00		93.1	80-129			
Surrogate: Toluene-d8	5.22			ug/L	5.00		104	80-120			
Surrogate: 4-Bromofluorobenzene	5.23			ug/L	5.00		105	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.90			ug/L	5.00		98.1	80-120			
LCS Dup (BJK0419-BSD1)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 12:51					
Gasoline Range Organics (Tol-Nap)	924		100	ug/L	1000		92.4	72-128	4.07	30	
Surrogate: Toluene-d8	5.25			ug/L	5.00		105	80-120			
Surrogate: 4-Bromofluorobenzene	5.42			ug/L	5.00		108	80-120			
LCS Dup (BJK0419-BSD2)						Prepared: 16-Nov-2021 Analyzed: 16-Nov-2021 13:16					
Vinyl Chloride	9.57	0.08	0.20	ug/L	10.0		95.7	66-133	3.09	30	
1,1-Dichloroethene	9.23	0.08	0.20	ug/L	10.0		92.3	69-135	0.99	30	
trans-1,2-Dichloroethene	9.65	0.07	0.20	ug/L	10.0		96.5	78-128	2.52	30	
cis-1,2-Dichloroethene	9.94	0.08	0.20	ug/L	10.0		99.4	80-121	4.01	30	
Benzene	10.5	0.05	0.20	ug/L	10.0		105	80-120	3.81	30	
Trichloroethene	10.7	0.07	0.20	ug/L	10.0		107	80-120	6.17	30	
Toluene	10.6	0.05	0.20	ug/L	10.0		106	80-120	3.43	30	
Tetrachloroethene	11.1	0.09	0.20	ug/L	10.0		111	80-120	5.37	30	
Ethylbenzene	10.6	0.05	0.20	ug/L	10.0		106	80-120	6.58	30	
m,p-Xylene	21.1	0.14	0.40	ug/L	20.0		106	80-121	2.29	30	
o-Xylene	10.3	0.08	0.20	ug/L	10.0		103	80-121	2.77	30	
Xylenes, total	31.5	0.22	0.60	ug/L	30.0		105	76-127	2.45	30	
Surrogate: 1,2-Dichloroethane-d4	4.96			ug/L	5.00		99.2	80-129			
Surrogate: Toluene-d8	5.30			ug/L	5.00		106	80-120			
Surrogate: 4-Bromofluorobenzene	5.34			ug/L	5.00		107	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.01			ug/L	5.00		100	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJK0451 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0451-BLK1)											
						Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 14:17					
Vinyl Chloride	ND	0.08	0.20	ug/L							U
1,1-Dichloroethene	ND	0.08	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.07	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.08	0.20	ug/L							U
Benzene	ND	0.05	0.20	ug/L							U
Trichloroethene	ND	0.07	0.20	ug/L							U
Toluene	ND	0.05	0.20	ug/L							U
Tetrachloroethene	ND	0.09	0.20	ug/L							U
Ethylbenzene	ND	0.05	0.20	ug/L							U
m,p-Xylene	ND	0.14	0.40	ug/L							U
o-Xylene	ND	0.08	0.20	ug/L							U
Xylenes, total	ND	0.22	0.60	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.48			ug/L	5.00		89.5	80-129			
<i>Surrogate: Toluene-d8</i>	5.22			ug/L	5.00		104	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.04			ug/L	5.00		101	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.89			ug/L	5.00		97.9	80-120			
LCS (BJK0451-BS1)											
						Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 12:09					
Vinyl Chloride	8.72	0.08	0.20	ug/L	10.0		87.2	66-133			
1,1-Dichloroethene	8.19	0.08	0.20	ug/L	10.0		81.9	69-135			
trans-1,2-Dichloroethene	8.15	0.07	0.20	ug/L	10.0		81.5	78-128			
cis-1,2-Dichloroethene	8.38	0.08	0.20	ug/L	10.0		83.8	80-121			
Benzene	9.26	0.05	0.20	ug/L	10.0		92.6	80-120			
Trichloroethene	9.17	0.07	0.20	ug/L	10.0		91.7	80-120			
Toluene	9.43	0.05	0.20	ug/L	10.0		94.3	80-120			
Tetrachloroethene	9.94	0.09	0.20	ug/L	10.0		99.4	80-120			
Ethylbenzene	9.20	0.05	0.20	ug/L	10.0		92.0	80-120			
m,p-Xylene	18.8	0.14	0.40	ug/L	20.0		94.0	80-121			
o-Xylene	9.27	0.08	0.20	ug/L	10.0		92.7	80-121			
Xylenes, total	28.1	0.22	0.60	ug/L	30.0		93.5	76-127			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.39			ug/L	5.00		87.8	80-129			
<i>Surrogate: Toluene-d8</i>	5.24			ug/L	5.00		105	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.07			ug/L	5.00		101	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.10			ug/L	5.00		102	80-120			


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - Quality Control
Batch BJK0451 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0451-BSD1)						Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 13:00					
Vinyl Chloride	8.71	0.08	0.20	ug/L	10.0		87.1	66-133	0.16	30	
1,1-Dichloroethene	8.43	0.08	0.20	ug/L	10.0		84.3	69-135	2.89	30	
trans-1,2-Dichloroethene	8.79	0.07	0.20	ug/L	10.0		87.9	78-128	7.53	30	
cis-1,2-Dichloroethene	8.76	0.08	0.20	ug/L	10.0		87.6	80-121	4.48	30	
Benzene	9.51	0.05	0.20	ug/L	10.0		95.1	80-120	2.62	30	
Trichloroethene	9.49	0.07	0.20	ug/L	10.0		94.9	80-120	3.43	30	
Toluene	9.50	0.05	0.20	ug/L	10.0		95.0	80-120	0.77	30	
Tetrachloroethene	10.8	0.09	0.20	ug/L	10.0		108	80-120	8.35	30	
Ethylbenzene	10.1	0.05	0.20	ug/L	10.0		101	80-120	9.16	30	
m,p-Xylene	21.0	0.14	0.40	ug/L	20.0		105	80-121	11.20	30	
o-Xylene	10.0	0.08	0.20	ug/L	10.0		100	80-121	7.75	30	
Xylenes, total	31.0	0.22	0.60	ug/L	30.0		103	76-127	10.10	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.24			ug/L	5.00		84.8	80-129			
<i>Surrogate: Toluene-d8</i>	5.11			ug/L	5.00		102	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.30			ug/L	5.00		106	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.06			ug/L	5.00		101	80-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Volatile Organic Compounds - SIM - Quality Control
Batch BJK0498 - EPA 5030C (Purge and Trap)

Instrument: NT16 Analyst: KOTT

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0498-BLK1)					Prepared: 19-Nov-2021 Analyzed: 19-Nov-2021 10:30						
Vinyl chloride	ND	5.01	20.0	ng/L							U
Surrogate: 1,2-Dichloroethane-d4	5230			ng/L	5000	105		80-129			
Surrogate: Toluene-d8	5150			ng/L	5000	103		80-120			
Surrogate: 4-Bromofluorobenzene	4880			ng/L	5000	97.6		75-125			
LCS (BJK0498-BS1)					Prepared: 19-Nov-2021 Analyzed: 19-Nov-2021 09:08						
Vinyl chloride	2310	5.01	20.0	ng/L	2000		116	62-141			
Surrogate: 1,2-Dichloroethane-d4	5210			ng/L	5000	104		80-129			
Surrogate: Toluene-d8	5690			ng/L	5000	114		80-120			
Surrogate: 4-Bromofluorobenzene	5110			ng/L	5000	102		75-125			
LCS Dup (BJK0498-BSD1)					Prepared: 19-Nov-2021 Analyzed: 19-Nov-2021 09:29						
Vinyl chloride	2030	5.01	20.0	ng/L	2000		101	62-141	13.30	30	
Surrogate: 1,2-Dichloroethane-d4	5160			ng/L	5000	103		80-129			
Surrogate: Toluene-d8	5300			ng/L	5000	106		80-120			
Surrogate: 4-Bromofluorobenzene	5160			ng/L	5000	103		75-125			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Dissolved Gases - Quality Control

Batch BJK0434 - EPA 5030C (Purge and Trap)

Instrument: FID6 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0434-BLK1)		Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 09:46								
Methane	ND	0.65	ug/L							U
Ethane	ND	1.23	ug/L							U
Ethene	ND	1.14	ug/L							U
Acetylene	ND	1.06	ug/L							U
Surrogate: Propane	1740		ug/L	1800		96.8	72-122			
LCS (BJK0434-BS1)		Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 09:10								
Methane	352	0.65	ug/L	328		107	80-120			
Ethane	697	1.23	ug/L	615		113	80-120			
Ethene	626	1.14	ug/L	575		109	80-120			
Acetylene	517	1.06	ug/L	530		97.6	73-123			
Surrogate: Propane	1790		ug/L	1800		99.5	62-122			
LCS Dup (BJK0434-BSD1)		Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 09:28								
Methane	349	0.65	ug/L	328		106	80-120	0.80	30	
Ethane	690	1.23	ug/L	615		112	80-120	1.09	30	
Ethene	623	1.14	ug/L	575		108	80-120	0.56	30	
Acetylene	518	1.06	ug/L	530		97.7	73-123	0.16	30	
Surrogate: Propane	1780		ug/L	1800		99.0	62-122			
Duplicate (BJK0434-DUP1)		Source: 21K0245-01		Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 14:58						
Methane	4730	0.65	ug/L		5060			6.74	30	
Ethane	4.16	1.23	ug/L		4.60			9.99	30	
Ethene	ND	1.14	ug/L		ND					U
Acetylene	ND	1.06	ug/L		ND					U
Surrogate: Propane	1180		ug/L	1800	1330	65.8	72-122			*
Duplicate (BJK0434-DUP2)		Source: 21K0245-05		Prepared: 17-Nov-2021 Analyzed: 17-Nov-2021 15:34						
Methane	6870	0.65	ug/L		7580			9.77	30	
Ethane	ND	1.23	ug/L		ND					U
Ethene	ND	1.14	ug/L		ND					U
Acetylene	ND	1.06	ug/L		ND					U
Surrogate: Propane	1480		ug/L	1800	1450	82.4	72-122			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0383-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 22:47					
Phenol	ND	0.01	0.2	ug/L							U
bis(2-chloroethyl) ether	ND	0.03	0.2	ug/L							U
2-Chlorophenol	ND	0.03	0.2	ug/L							U
1,3-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,4-Dichlorobenzene	ND	0.03	0.2	ug/L							U
1,2-Dichlorobenzene	ND	0.03	0.2	ug/L							U
Benzyl Alcohol	0.04	0.02	0.2	ug/L							J
2,2'-Oxybis(1-chloropropane)	ND	0.03	0.2	ug/L							U
2-Methylphenol	ND	0.03	0.2	ug/L							U
Hexachloroethane	ND	0.04	0.2	ug/L							U
N-Nitroso-di-n-Propylamine	ND	0.04	0.2	ug/L							U
4-Methylphenol	ND	0.03	0.2	ug/L							U
Nitrobenzene	ND	0.03	0.2	ug/L							U
Isophorone	ND	0.03	0.2	ug/L							U
2-Nitrophenol	ND	0.04	1.0	ug/L							U
2,4-Dimethylphenol	ND	0.3	1.0	ug/L							U
Bis(2-Chloroethoxy)methane	ND	0.03	0.2	ug/L							U
2,4-Dichlorophenol	ND	0.1	1.0	ug/L							U
1,2,4-Trichlorobenzene	ND	0.03	0.2	ug/L							U
Naphthalene	ND	0.03	0.2	ug/L							U
Benzoic acid	ND	0.1	2.0	ug/L							U
4-Chloroaniline	ND	0.04	1.0	ug/L							U
Hexachlorobutadiene	ND	0.04	0.2	ug/L							U
4-Chloro-3-Methylphenol	ND	0.1	1.0	ug/L							U
2-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Hexachlorocyclopentadiene	ND	0.1	1.0	ug/L							U
2,4,6-Trichlorophenol	ND	0.2	1.0	ug/L							U
2,4,5-Trichlorophenol	ND	0.1	1.0	ug/L							U
2-Chloronaphthalene	ND	0.03	0.2	ug/L							U
2-Nitroaniline	ND	0.2	1.0	ug/L							U
Acenaphthylene	ND	0.02	0.2	ug/L							U
Dimethylphthalate	ND	0.04	0.2	ug/L							U
2,6-Dinitrotoluene	ND	0.2	1.0	ug/L							U
Acenaphthene	ND	0.03	0.2	ug/L							U
3-Nitroaniline	ND	0.2	1.0	ug/L							U


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 Project: Lower Duwamish Q4
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Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0383-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 22:47					
2,4-Dinitrophenol	ND	0.2	2.0	ug/L							U
Dibenzofuran	ND	0.02	0.2	ug/L							U
4-Nitrophenol	ND	0.06	1.0	ug/L							U
2,4-Dinitrotoluene	ND	0.1	1.0	ug/L							U
Fluorene	ND	0.02	0.2	ug/L							U
4-Chlorophenylphenyl ether	ND	0.02	0.2	ug/L							U
Diethyl phthalate	0.08	0.06	0.2	ug/L							J
4-Nitroaniline	ND	0.2	1.0	ug/L							U
4,6-Dinitro-2-methylphenol	ND	0.4	2.0	ug/L							U
N-Nitrosodiphenylamine	ND	0.03	0.2	ug/L							U
4-Bromophenyl phenyl ether	ND	0.02	0.2	ug/L							U
Hexachlorobenzene	ND	0.04	0.2	ug/L							U
Pentachlorophenol	ND	0.1	1.0	ug/L							U
Phenanthrene	ND	0.02	0.2	ug/L							U
Anthracene	ND	0.03	0.2	ug/L							U
Carbazole	ND	0.04	0.2	ug/L							U
Di-n-Butylphthalate	ND	0.05	0.2	ug/L							U
Fluoranthene	ND	0.03	0.2	ug/L							U
Pyrene	ND	0.03	0.2	ug/L							U
Butylbenzylphthalate	ND	0.07	0.2	ug/L							U
Benzo(a)anthracene	ND	0.04	0.2	ug/L							U
3,3'-Dichlorobenzidine	ND	0.3	1.0	ug/L							U
Chrysene	ND	0.04	0.2	ug/L							U
bis(2-Ethylhexyl)phthalate	ND	0.2	0.2	ug/L							U
Di-n-Octylphthalate	ND	0.05	0.2	ug/L							U
Benzo(a)fluoranthene, Total	ND	0.08	0.4	ug/L							U
Benzo(a)pyrene	ND	0.05	0.2	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.06	0.2	ug/L							U
Dibenzo(a,h)anthracene	ND	0.07	0.2	ug/L							U
Benzo(g,h,i)perylene	ND	0.04	0.2	ug/L							U
1-Methylnaphthalene	ND	0.03	0.2	ug/L							U
Surrogate: 2-Fluorophenol	3.47			ug/L	7.50		46.3	30-160			
Surrogate: Phenol-d5	2.24			ug/L	7.50		29.8	30-160			*
Surrogate: 2-Chlorophenol-d4	6.18			ug/L	7.50		82.5	30-160			


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 Project: Lower Duwamish Q4
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Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0383-BLK1)						Prepared: 18-Nov-2021	Analyzed: 27-Nov-2021 22:47				
Surrogate: 1,2-Dichlorobenzene-d4	3.27			ug/L	5.00		65.3	30-160			
Surrogate: Nitrobenzene-d5	3.90			ug/L	5.00		77.9	30-160			
Surrogate: 2-Fluorobiphenyl	4.08			ug/L	5.00		81.6	30-160			
Surrogate: 2,4,6-Tribromophenol	7.02			ug/L	7.50		93.5	30-160			
Surrogate: p-Terphenyl-d14	5.11			ug/L	5.00		102	30-160			Q
LCS (BJK0383-BS1)						Prepared: 18-Nov-2021	Analyzed: 27-Nov-2021 23:25				
Phenol	2.0	0.01	0.2	ug/L	5.00		39.1	30-160			
bis(2-chloroethyl) ether	4.6	0.03	0.2	ug/L	5.00		91.1	30-160			
2-Chlorophenol	3.8	0.03	0.2	ug/L	5.00		75.7	30-160			
1,3-Dichlorobenzene	3.4	0.03	0.2	ug/L	5.00		67.2	30-160			
1,4-Dichlorobenzene	3.9	0.03	0.2	ug/L	5.00		77.5	30-160			
1,2-Dichlorobenzene	3.5	0.03	0.2	ug/L	5.00		69.5	30-160			
Benzyl Alcohol	2.9	0.02	0.2	ug/L	5.00		57.3	30-160			
2,2'-Oxybis(1-chloropropane)	4.2	0.03	0.2	ug/L	5.00		84.7	30-160			
2-Methylphenol	3.4	0.03	0.2	ug/L	5.00		68.7	30-160			
Hexachloroethane	3.4	0.04	0.2	ug/L	5.00		67.7	30-160			
N-Nitroso-di-n-Propylamine	3.8	0.04	0.2	ug/L	5.00		76.6	30-160			
4-Methylphenol	3.2	0.03	0.2	ug/L	5.00		63.4	30-160			
Nitrobenzene	4.4	0.03	0.2	ug/L	5.00		87.4	30-160			
Isophorone	6.1	0.03	0.2	ug/L	5.00		123	30-160			
2-Nitrophenol	5.1	0.04	1.0	ug/L	5.00		102	30-160			Q
2,4-Dimethylphenol	10.3	0.3	1.0	ug/L	13.0		79.3	30-160			
Bis(2-Chloroethoxy)methane	5.3	0.03	0.2	ug/L	5.00		105	30-160			
2,4-Dichlorophenol	13.1	0.1	1.0	ug/L	13.0		101	30-160			
1,2,4-Trichlorobenzene	3.4	0.03	0.2	ug/L	5.00		67.6	30-160			
Naphthalene	3.8	0.03	0.2	ug/L	5.00		76.5	30-160			
Benzoic acid	8.9	0.1	2.0	ug/L	23.0		38.6	30-160			
4-Chloroaniline	2.4	0.04	1.0	ug/L	13.0		18.4	30-160			*
Hexachlorobutadiene	3.0	0.04	0.2	ug/L	5.00		59.4	30-160			
4-Chloro-3-Methylphenol	13.9	0.1	1.0	ug/L	13.0		107	30-160			
2-Methylnaphthalene	4.2	0.03	0.2	ug/L	5.00		84.6	30-160			
Hexachlorocyclopentadiene	3.2	0.1	1.0	ug/L	13.0		24.6	30-160			*, Q
2,4,6-Trichlorophenol	13.9	0.2	1.0	ug/L	13.0		107	30-160			Q
2,4,5-Trichlorophenol	13.7	0.1	1.0	ug/L	13.0		105	30-160			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0383-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 23:25					
2-Chloronaphthalene	4.5	0.03	0.2	ug/L	5.00		90.1	30-160			
2-Nitroaniline	14.9	0.2	1.0	ug/L	13.0		114	30-160			
Acenaphthylene	3.7	0.02	0.2	ug/L	5.00		73.8	30-160			
Dimethylphthalate	4.3	0.04	0.2	ug/L	5.00		86.9	30-160			
2,6-Dinitrotoluene	15.2	0.2	1.0	ug/L	13.0		117	30-160			
Acenaphthene	4.0	0.03	0.2	ug/L	5.00		80.0	30-160			
3-Nitroaniline	13.1	0.2	1.0	ug/L	13.0		100	30-160			
2,4-Dinitrophenol	25.3	0.2	2.0	ug/L	23.0		110	30-160			
Dibenzofuran	4.6	0.02	0.2	ug/L	5.00		91.2	30-160			
4-Nitrophenol	4.0	0.06	1.0	ug/L	13.0		31.1	30-160			Q
2,4-Dinitrotoluene	15.2	0.1	1.0	ug/L	13.0		117	30-160			Q
Fluorene	3.4	0.02	0.2	ug/L	5.00		67.6	30-160			Q
4-Chlorophenylphenyl ether	2.7	0.02	0.2	ug/L	5.00		54.5	30-160			Q
Diethyl phthalate	4.2	0.06	0.2	ug/L	5.00		84.4	30-160			
4-Nitroaniline	15.4	0.2	1.0	ug/L	13.0		118	30-160			
4,6-Dinitro-2-methylphenol	26.2	0.4	2.0	ug/L	23.0		114	30-160			
N-Nitrosodiphenylamine	4.2	0.03	0.2	ug/L	5.00		84.5	30-160			
4-Bromophenyl phenyl ether	4.8	0.02	0.2	ug/L	5.00		95.6	30-160			
Hexachlorobenzene	4.2	0.04	0.2	ug/L	5.00		84.0	30-160			
Pentachlorophenol	7.4	0.1	1.0	ug/L	13.0		57.1	30-160			Q
Phenanthrene	4.1	0.02	0.2	ug/L	5.00		81.5	30-160			
Anthracene	4.1	0.03	0.2	ug/L	5.00		81.0	30-160			
Carbazole	4.6	0.04	0.2	ug/L	5.00		91.2	30-160			
Di-n-Butylphthalate	5.0	0.05	0.2	ug/L	5.00		99.2	30-160			
Fluoranthene	5.7	0.03	0.2	ug/L	5.00		114	30-160			Q
Pyrene	5.8	0.03	0.2	ug/L	5.00		115	30-160			Q
Butylbenzylphthalate	5.3	0.07	0.2	ug/L	5.00		106	30-160			Q
Benzo(a)anthracene	4.5	0.04	0.2	ug/L	5.00		90.7	30-160			
3,3'-Dichlorobenzidine	13.3	0.3	1.0	ug/L	13.0		102	30-160			
Chrysene	4.3	0.04	0.2	ug/L	5.00		86.8	30-160			
bis(2-Ethylhexyl)phthalate	5.0	0.2	0.2	ug/L	5.00		101	30-160			Q
Di-n-Octylphthalate	4.5	0.05	0.2	ug/L	5.00		89.2	30-160			
Benzo(a)fluoranthene, Total	8.7	0.08	0.4	ug/L	10.0		87.3	30-160			
Benzo(a)pyrene	4.2	0.05	0.2	ug/L	5.00		84.4	30-160			
Indeno(1,2,3-cd)pyrene	4.0	0.06	0.2	ug/L	5.00		80.7	30-160			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0383-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 23:25					
Dibenzo(a,h)anthracene	3.9	0.07	0.2	ug/L	5.00		78.1	30-160			
Benzo(g,h,i)perylene	3.7	0.04	0.2	ug/L	5.00		73.8	30-160			
1-Methylnaphthalene	4.6	0.03	0.2	ug/L	5.00		91.8	30-160			
Surrogate: 2-Fluorophenol	4.26			ug/L	7.50		56.8	30-160			
Surrogate: Phenol-d5	3.02			ug/L	7.50		40.2	30-160			
Surrogate: 2-Chlorophenol-d4	6.63			ug/L	7.50		88.5	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.40			ug/L	5.00		68.0	30-160			
Surrogate: Nitrobenzene-d5	4.43			ug/L	5.00		88.7	30-160			
Surrogate: 2-Fluorobiphenyl	4.41			ug/L	5.00		88.2	30-160			
Surrogate: 2,4,6-Tribromophenol	7.63			ug/L	7.50		102	30-160			
Surrogate: p-Terphenyl-d14	5.70			ug/L	5.00		114	30-160			Q
LCS Dup (BJK0383-BSD1)						Prepared: 18-Nov-2021 Analyzed: 28-Nov-2021 00:02					
Phenol	2.0	0.01	0.2	ug/L	5.00		40.9	30-160	4.57	30	
bis(2-chloroethyl) ether	4.8	0.03	0.2	ug/L	5.00		95.5	30-160	4.80	30	
2-Chlorophenol	4.1	0.03	0.2	ug/L	5.00		81.2	30-160	6.95	30	
1,3-Dichlorobenzene	3.7	0.03	0.2	ug/L	5.00		73.3	30-160	8.57	30	
1,4-Dichlorobenzene	4.2	0.03	0.2	ug/L	5.00		83.8	30-160	7.79	30	
1,2-Dichlorobenzene	3.8	0.03	0.2	ug/L	5.00		75.9	30-160	8.75	30	
Benzyl Alcohol	3.0	0.02	0.2	ug/L	5.00		60.0	30-160	4.56	30	
2,2'-Oxybis(1-chloropropane)	4.5	0.03	0.2	ug/L	5.00		90.3	30-160	6.45	30	
2-Methylphenol	3.7	0.03	0.2	ug/L	5.00		73.3	30-160	6.48	30	
Hexachloroethane	3.7	0.04	0.2	ug/L	5.00		74.2	30-160	9.08	30	
N-Nitroso-di-n-Propylamine	4.1	0.04	0.2	ug/L	5.00		82.5	30-160	7.41	30	
4-Methylphenol	3.4	0.03	0.2	ug/L	5.00		68.6	30-160	7.91	30	
Nitrobenzene	4.7	0.03	0.2	ug/L	5.00		94.1	30-160	7.37	30	
Isophorone	6.6	0.03	0.2	ug/L	5.00		131	30-160	6.55	30	
2-Nitrophenol	5.6	0.04	1.0	ug/L	5.00		112	30-160	8.87	30	Q
2,4-Dimethylphenol	11.0	0.3	1.0	ug/L	13.0		85.0	30-160	6.89	30	
Bis(2-Chloroethoxy)methane	5.6	0.03	0.2	ug/L	5.00		112	30-160	6.50	30	
2,4-Dichlorophenol	14.3	0.1	1.0	ug/L	13.0		110	30-160	8.74	30	
1,2,4-Trichlorobenzene	3.6	0.03	0.2	ug/L	5.00		72.6	30-160	7.15	30	
Naphthalene	4.1	0.03	0.2	ug/L	5.00		81.5	30-160	6.41	30	
Benzoic acid	9.7	0.1	2.0	ug/L	23.0		42.0	30-160	8.30	30	
4-Chloroaniline	2.2	0.04	1.0	ug/L	13.0		17.2	30-160	6.67	30	*


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0383-BSD1)					Prepared: 18-Nov-2021 Analyzed: 28-Nov-2021 00:02						
Hexachlorobutadiene	3.2	0.04	0.2	ug/L	5.00		64.5	30-160	8.23	30	
4-Chloro-3-Methylphenol	14.6	0.1	1.0	ug/L	13.0		112	30-160	5.13	30	
2-Methylnaphthalene	4.5	0.03	0.2	ug/L	5.00		90.6	30-160	6.77	30	
Hexachlorocyclopentadiene	3.8	0.1	1.0	ug/L	13.0		29.2	30-160	16.90	30	*, Q
2,4,6-Trichlorophenol	14.8	0.2	1.0	ug/L	13.0		114	30-160	5.78	30	Q
2,4,5-Trichlorophenol	14.4	0.1	1.0	ug/L	13.0		111	30-160	5.10	30	
2-Chloronaphthalene	4.8	0.03	0.2	ug/L	5.00		95.2	30-160	5.50	30	
2-Nitroaniline	15.9	0.2	1.0	ug/L	13.0		122	30-160	6.77	30	
Acenaphthylene	3.9	0.02	0.2	ug/L	5.00		77.9	30-160	5.33	30	
Dimethylphthalate	4.5	0.04	0.2	ug/L	5.00		90.4	30-160	4.01	30	
2,6-Dinitrotoluene	16.3	0.2	1.0	ug/L	13.0		126	30-160	7.38	30	
Acenaphthene	4.3	0.03	0.2	ug/L	5.00		86.0	30-160	7.20	30	
3-Nitroaniline	13.9	0.2	1.0	ug/L	13.0		107	30-160	6.28	30	
2,4-Dinitrophenol	26.7	0.2	2.0	ug/L	23.0		116	30-160	5.59	30	
Dibenzofuran	4.9	0.02	0.2	ug/L	5.00		97.2	30-160	6.45	30	
4-Nitrophenol	4.3	0.06	1.0	ug/L	13.0		33.2	30-160	6.54	30	Q
2,4-Dinitrotoluene	16.4	0.1	1.0	ug/L	13.0		126	30-160	7.58	30	Q
Fluorene	3.2	0.02	0.2	ug/L	5.00		63.3	30-160	6.62	30	Q
4-Chlorophenylphenyl ether	2.9	0.02	0.2	ug/L	5.00		57.8	30-160	5.73	30	Q
Diethyl phthalate	4.5	0.06	0.2	ug/L	5.00		89.4	30-160	5.77	30	
4-Nitroaniline	16.5	0.2	1.0	ug/L	13.0		127	30-160	6.98	30	
4,6-Dinitro-2-methylphenol	27.2	0.4	2.0	ug/L	23.0		118	30-160	3.51	30	
N-Nitrosodiphenylamine	4.6	0.03	0.2	ug/L	5.00		91.4	30-160	7.83	30	
4-Bromophenyl phenyl ether	5.0	0.02	0.2	ug/L	5.00		100	30-160	4.53	30	
Hexachlorobenzene	4.4	0.04	0.2	ug/L	5.00		89.0	30-160	5.74	30	
Pentachlorophenol	7.6	0.1	1.0	ug/L	13.0		58.4	30-160	2.30	30	Q
Phenanthrene	4.4	0.02	0.2	ug/L	5.00		88.0	30-160	7.70	30	
Anthracene	4.3	0.03	0.2	ug/L	5.00		85.5	30-160	5.39	30	
Carbazole	4.8	0.04	0.2	ug/L	5.00		95.3	30-160	4.41	30	
Di-n-Butylphthalate	5.2	0.05	0.2	ug/L	5.00		103	30-160	3.96	30	
Fluoranthene	5.9	0.03	0.2	ug/L	5.00		117	30-160	2.86	30	Q
Pyrene	5.8	0.03	0.2	ug/L	5.00		116	30-160	0.96	30	Q
Butylbenzylphthalate	5.5	0.07	0.2	ug/L	5.00		110	30-160	3.26	30	Q
Benzo(a)anthracene	4.8	0.04	0.2	ug/L	5.00		95.7	30-160	5.34	30	
3,3'-Dichlorobenzidine	13.7	0.3	1.0	ug/L	13.0		105	30-160	3.06	30	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - Quality Control
Batch BJK0383 - EPA 3510C SepF

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0383-BSD1)						Prepared: 18-Nov-2021 Analyzed: 28-Nov-2021 00:02					
Chrysene	4.5	0.04	0.2	ug/L	5.00		90.1	30-160	3.68	30	
bis(2-Ethylhexyl)phthalate	5.2	0.2	0.2	ug/L	5.00		104	30-160	3.41	30	Q
Di-n-Octylphthalate	4.7	0.05	0.2	ug/L	5.00		94.8	30-160	6.08	30	
Benzo(a)fluoranthenes, Total	9.7	0.08	0.4	ug/L	10.0		96.9	30-160	10.40	30	
Benzo(a)pyrene	4.5	0.05	0.2	ug/L	5.00		90.5	30-160	6.99	30	
Indeno(1,2,3-cd)pyrene	4.2	0.06	0.2	ug/L	5.00		83.4	30-160	3.27	30	
Dibenzo(a,h)anthracene	4.0	0.07	0.2	ug/L	5.00		80.6	30-160	3.16	30	
Benzo(g,h,i)perylene	3.8	0.04	0.2	ug/L	5.00		77.0	30-160	4.24	30	
1-Methylnaphthalene	4.9	0.03	0.2	ug/L	5.00		97.8	30-160	6.41	30	
Surrogate: 2-Fluorophenol	4.20			ug/L	7.50		56.1	30-160			
Surrogate: Phenol-d5	3.04			ug/L	7.50		40.5	30-160			
Surrogate: 2-Chlorophenol-d4	6.61			ug/L	7.50		88.1	30-160			
Surrogate: 1,2-Dichlorobenzene-d4	3.63			ug/L	5.00		72.6	30-160			
Surrogate: Nitrobenzene-d5	4.61			ug/L	5.00		92.1	30-160			
Surrogate: 2-Fluorobiphenyl	4.55			ug/L	5.00		91.0	30-160			
Surrogate: 2,4,6-Tribromophenol	7.64			ug/L	7.50		102	30-160			
Surrogate: p-Terphenyl-d14	5.60			ug/L	5.00		112	30-160			Q



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BJK0380 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0380-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 13:40					
Naphthalene	0.003	0.001	0.010	ug/L							J
2-Methylnaphthalene	0.002	0.001	0.010	ug/L							J
1-Methylnaphthalene	0.001	0.0009	0.010	ug/L							J
Acenaphthylene	ND	0.002	0.010	ug/L							U
Acenaphthene	ND	0.003	0.010	ug/L							U
Dibenzofuran	ND	0.002	0.010	ug/L							U
Fluorene	ND	0.002	0.010	ug/L							U
Phenanthrene	ND	0.001	0.010	ug/L							U
Anthracene	ND	0.001	0.010	ug/L							U
Carbazole	ND	0.001	0.010	ug/L							U
Fluoranthene	ND	0.002	0.010	ug/L							U
Pyrene	ND	0.001	0.010	ug/L							U
Benzo(a)anthracene	ND	0.0008	0.010	ug/L							U
Chrysene	ND	0.0009	0.010	ug/L							U
Benzo(b)fluoranthene	ND	0.0005	0.010	ug/L							U
Benzo(k)fluoranthene	ND	0.003	0.010	ug/L							U
Benzo(j)fluoranthene	ND	0.002	0.010	ug/L							U
Benzofluoranthenes, Total	ND	0.004	0.010	ug/L							U
Benzo(a)pyrene	ND	0.002	0.010	ug/L							U
Perylene	ND	0.006	0.010	ug/L							U
Indeno(1,2,3-cd)pyrene	ND	0.001	0.010	ug/L							U
Dibenzo(a,h)anthracene	ND	0.001	0.010	ug/L							U
Benzo(g,h,i)perylene	ND	0.001	0.010	ug/L							U
Surrogate: 2-Methylnaphthalene-d10	0.251			ug/L	0.300		83.7	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.204			ug/L	0.300		68.0	29-120			
Surrogate: Fluoranthene-d10	0.280			ug/L	0.300		93.2	57-120			

LCS (BJK0380-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 14:09					
Naphthalene	0.230	0.001	0.010	ug/L	0.300		76.8	37-120			
2-Methylnaphthalene	0.251	0.001	0.010	ug/L	0.300		83.8	37-120			
1-Methylnaphthalene	0.252	0.0009	0.010	ug/L	0.300		83.9	29-120			
Acenaphthylene	0.262	0.002	0.010	ug/L	0.300		87.4	41-120			
Acenaphthene	0.261	0.003	0.010	ug/L	0.300		87.0	41-120			
Dibenzofuran	0.242	0.002	0.010	ug/L	0.300		80.7	38-120			
Fluorene	0.264	0.002	0.010	ug/L	0.300		87.9	43-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0380 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0380-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 14:09					
Phenanthrene	0.255	0.001	0.010	ug/L	0.300		85.2	41-120			
Anthracene	0.248	0.001	0.010	ug/L	0.300		82.5	40-120			
Carbazole	0.269	0.001	0.010	ug/L	0.300		89.8	30-160			
Fluoranthene	0.265	0.002	0.010	ug/L	0.300		88.4	45-120			
Pyrene	0.265	0.001	0.010	ug/L	0.300		88.4	41-120			
Benzo(a)anthracene	0.271	0.0008	0.010	ug/L	0.300		90.2	42-120			
Chrysene	0.251	0.0009	0.010	ug/L	0.300		83.7	44-120			
Benzo(b)fluoranthene	0.260	0.0005	0.010	ug/L	0.300		86.7	44-120			
Benzo(k)fluoranthene	0.248	0.003	0.010	ug/L	0.300		82.7	50-120			
Benzo(j)fluoranthene	0.238	0.002	0.010	ug/L	0.300		79.4	39-160			
Benzofluoranthenes, Total	0.746	0.004	0.010	ug/L	0.900		82.9	46-120			
Benzo(a)pyrene	0.225	0.002	0.010	ug/L	0.300		75.0	35-120			
Perylene	0.221	0.006	0.010	ug/L	0.300		73.7	30-160			
Indeno(1,2,3-cd)pyrene	0.244	0.001	0.010	ug/L	0.300		81.4	37-120			
Dibenzo(a,h)anthracene	0.245	0.001	0.010	ug/L	0.300		81.5	34-120			
Benzo(g,h,i)perylene	0.202	0.001	0.010	ug/L	0.300		67.2	38-120			
Surrogate: 2-Methylnaphthalene-d10	0.273			ug/L	0.300		90.9	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.243			ug/L	0.300		80.9	29-120			
Surrogate: Fluoranthene-d10	0.293			ug/L	0.300		97.6	57-120			
LCS Dup (BJK0380-BSD1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 14:40					
Naphthalene	0.245	0.001	0.010	ug/L	0.300		81.7	37-120	6.17	30	
2-Methylnaphthalene	0.266	0.001	0.010	ug/L	0.300		88.7	37-120	5.65	30	
1-Methylnaphthalene	0.263	0.0009	0.010	ug/L	0.300		87.8	29-120	4.59	30	
Acenaphthylene	0.283	0.002	0.010	ug/L	0.300		94.4	41-120	7.66	30	
Acenaphthene	0.284	0.003	0.010	ug/L	0.300		94.6	41-120	8.32	30	
Dibenzofuran	0.265	0.002	0.010	ug/L	0.300		88.4	38-120	9.14	30	
Fluorene	0.285	0.002	0.010	ug/L	0.300		95.0	43-120	7.81	30	
Phenanthrene	0.276	0.001	0.010	ug/L	0.300		92.0	41-120	7.77	30	
Anthracene	0.270	0.001	0.010	ug/L	0.300		89.9	40-120	8.59	30	
Carbazole	0.284	0.001	0.010	ug/L	0.300		94.7	30-160	5.30	30	
Fluoranthene	0.284	0.002	0.010	ug/L	0.300		94.8	45-120	6.99	30	
Pyrene	0.282	0.001	0.010	ug/L	0.300		94.0	41-120	6.16	30	
Benzo(a)anthracene	0.287	0.0008	0.010	ug/L	0.300		95.8	42-120	5.99	30	
Chrysene	0.267	0.0009	0.010	ug/L	0.300		88.9	44-120	6.08	30	


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Semivolatile Organic Compounds - SIM - Quality Control
Batch BJK0380 - EPA 3510C SepF

Instrument: NT11 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJK0380-BS01)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 14:40					
Benzo(b)fluoranthene	0.280	0.0005	0.010	ug/L	0.300		93.5	44-120	7.50	30	
Benzo(k)fluoranthene	0.268	0.003	0.010	ug/L	0.300		89.3	50-120	7.68	30	
Benzo(j)fluoranthene	0.259	0.002	0.010	ug/L	0.300		86.2	39-160	8.23	30	
Benzofluoranthenes, Total	0.807	0.004	0.010	ug/L	0.900		89.7	46-120	7.79	30	
Benzo(a)pyrene	0.244	0.002	0.010	ug/L	0.300		81.4	35-120	8.24	30	
Perylene	0.237	0.006	0.010	ug/L	0.300		78.8	30-160	6.75	30	
Indeno(1,2,3-cd)pyrene	0.255	0.001	0.010	ug/L	0.300		85.1	37-120	4.51	30	
Dibenzo(a,h)anthracene	0.254	0.001	0.010	ug/L	0.300		84.7	34-120	3.78	30	
Benzo(g,h,i)perylene	0.210	0.001	0.010	ug/L	0.300		69.9	38-120	3.96	30	
Surrogate: 2-Methylnaphthalene-d10	0.274			ug/L	0.300		91.4	42-120			
Surrogate: Dibenzo[a,h]anthracene-d14	0.243			ug/L	0.300		81.1	29-120			
Surrogate: Fluoranthene-d10	0.304			ug/L	0.300		101	57-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Petroleum Hydrocarbons - Quality Control
Batch BJK0381 - EPA 3510C SepF

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0381-BLK1)									
				Prepared: 17-Nov-2021 Analyzed: 22-Nov-2021 16:40					
Diesel Range Organics (C12-C24)	ND	0.100	mg/L						U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L						U
Surrogate: <i>o</i> -Terphenyl	0.220		mg/L	0.225	97.6	50-150			
LCS (BJK0381-BS1)									
				Prepared: 17-Nov-2021 Analyzed: 22-Nov-2021 16:59					
Diesel Range Organics (C12-C24)	2.57	0.100	mg/L	3.00	85.6	56-120			
Surrogate: <i>o</i> -Terphenyl	0.225		mg/L	0.225	100	50-150			
LCS Dup (BJK0381-BSD1)									
				Prepared: 17-Nov-2021 Analyzed: 22-Nov-2021 17:19					
Diesel Range Organics (C12-C24)	2.85	0.100	mg/L	3.00	95.1	56-120	10.50	30	
Surrogate: <i>o</i> -Terphenyl	0.233		mg/L	0.225	104	50-150			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BJK0382 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0382-BLK1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 19:50					
Aroclor 1016	ND	0.002	0.010	ug/L							U
Aroclor 1221	ND	0.002	0.010	ug/L							U
Aroclor 1232	ND	0.002	0.010	ug/L							U
Aroclor 1242	ND	0.002	0.010	ug/L							U
Aroclor 1248	ND	0.002	0.010	ug/L							U
Aroclor 1254	ND	0.002	0.010	ug/L							U
Aroclor 1260	ND	0.003	0.010	ug/L							U
Aroclor 1262	ND	0.003	0.010	ug/L							U
Aroclor 1268	ND	0.003	0.010	ug/L							U
Surrogate: Decachlorobiphenyl	0.0159			ug/L	0.0200		79.5	29-120			
Surrogate: Tetrachlorometaxylene	0.0127			ug/L	0.0200		63.4	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0166			ug/L	0.0200		83.1	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0117			ug/L	0.0200		58.6	32-120			
LCS (BJK0382-BS1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 20:11					
Aroclor 1016	0.045	0.002	0.010	ug/L	0.0500		90.2	54-120			
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		82.3	51-128			
Surrogate: Decachlorobiphenyl	0.0160			ug/L	0.0200		80.2	29-120			
Surrogate: Tetrachlorometaxylene	0.0151			ug/L	0.0200		75.4	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0164			ug/L	0.0200		82.2	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0145			ug/L	0.0200		72.4	32-120			
LCS Dup (BJK0382-BSD1)						Prepared: 18-Nov-2021 Analyzed: 27-Nov-2021 20:32					
Aroclor 1016	0.042	0.002	0.010	ug/L	0.0500		83.7	54-120	7.56	30	
Aroclor 1260	0.041	0.003	0.010	ug/L	0.0500		81.1	51-128	1.45	30	
Surrogate: Decachlorobiphenyl	0.0162			ug/L	0.0200		81.0	29-120			
Surrogate: Tetrachlorometaxylene	0.0144			ug/L	0.0200		71.8	32-120			
Surrogate: Decachlorobiphenyl [2C]	0.0165			ug/L	0.0200		82.7	29-120			
Surrogate: Tetrachlorometaxylene [2C]	0.0133			ug/L	0.0200		66.6	32-120			


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0411 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0411-BLK1)						Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:07					
Mercury	0.000030	0.000013	0.000100	mg/L							J
LCS (BJK0411-BS1)						Prepared: 16-Nov-2021 Analyzed: 19-Nov-2021 14:09					
Mercury	0.00171	0.000013	0.000100	mg/L	0.00200		85.6	80-120			



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BJK0507 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0507-BLK1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 00:47						
Arsenic	75a	ND	0.0373	0.200	ug/L							U
Copper	63	ND	0.173	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	2.92	6.00	ug/L							U
Zinc	67	ND	0.940	6.00	ug/L							U
Blank (BJK0507-BLK2)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 16:49						
Barium	135	ND	0.114	0.500	ug/L							U
Barium	137	ND	0.0765	0.500	ug/L							U
Chromium	52	ND	0.260	0.500	ug/L							U
Chromium	53	ND	0.239	0.500	ug/L							U
Iron	54	ND	18.2	36.0	ug/L							U
Iron	57	ND	6.63	36.0	ug/L							U
Lead	208	ND	0.0513	0.100	ug/L							U
Manganese	55	ND	0.142	0.500	ug/L							U
Silver	107	ND	0.0220	0.200	ug/L							U
Vanadium	51a	ND	0.0556	0.200	ug/L							U
Vanadium	51b	ND	0.0521	0.200	ug/L							U
Cadmium	111	ND	0.0300	0.100	ug/L							U
Cadmium	114	ND	0.0400	0.100	ug/L							U
Cobalt	59	ND	0.0178	0.200	ug/L							U
Nickel	60	ND	0.0792	0.500	ug/L							U
Nickel	62	ND	0.220	0.500	ug/L							U
Blank (BJK0507-BLK3)						Prepared: 18-Nov-2021 Analyzed: 24-Nov-2021 15:54						
Selenium	78	ND	0.179	0.500	ug/L							U
LCS (BJK0507-BS1)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 00:51						
Arsenic	75a	25.3	0.0373	0.200	ug/L	25.0		101	80-120			
Copper	63	26.7	0.173	0.500	ug/L	25.0		107	80-120			
Copper	65	27.0	0.350	0.500	ug/L	25.0		108	80-120			
Zinc	66	84.7	2.92	6.00	ug/L	80.0		106	80-120			
Zinc	67	80.6	0.940	6.00	ug/L	80.0		101	80-120			
LCS (BJK0507-BS2)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 16:53						
Barium	135	26.0	0.114	0.500	ug/L	25.0		104	80-120			


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds - Quality Control
Batch BJK0507 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0507-BS2)						Prepared: 18-Nov-2021 Analyzed: 23-Nov-2021 16:53						
Barium	137	25.9	0.0765	0.500	ug/L	25.0		103	80-120			
Chromium	52	26.0	0.260	0.500	ug/L	25.0		104	80-120			
Chromium	53	26.2	0.239	0.500	ug/L	25.0		105	80-120			
Iron	54	5160	18.2	36.0	ug/L	5000		103	80-120			
Iron	57	5250	6.63	36.0	ug/L	5000		105	80-120			
Lead	208	25.4	0.0513	0.100	ug/L	25.0		102	80-120			
Manganese	55	25.9	0.142	0.500	ug/L	25.0		104	80-120			
Silver	107	25.6	0.0220	0.200	ug/L	25.0		103	80-120			
Vanadium	51a	25.8	0.0556	0.200	ug/L	25.0		103	80-120			
Vanadium	51b	25.9	0.0521	0.200	ug/L	25.0		103	80-120			
Cadmium	111	25.3	0.0300	0.100	ug/L	25.0		101	80-120			
Cadmium	114	24.6	0.0400	0.100	ug/L	25.0		98.6	80-120			
Cobalt	59	25.7	0.0178	0.200	ug/L	25.0		103	80-120			
Nickel	60	26.1	0.0792	0.500	ug/L	25.0		105	80-120			
Nickel	62	26.3	0.220	0.500	ug/L	25.0		105	80-120			


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0578 - TWM EPA 7470A

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0578-BLK1)						Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 14:40					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L							U
LCS (BJK0578-BS1)						Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 14:42					
Mercury, Dissolved	0.00175	0.000013	0.000100	mg/L	0.00200		87.4	80-120			
Duplicate (BJK0578-DUP1)						Source: 21K0245-02 Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 15:05					
Mercury, Dissolved	ND	0.000013	0.000100	mg/L		ND					U
Matrix Spike (BJK0578-MS1)						Source: 21K0245-02 Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 15:08					
Mercury, Dissolved	0.000947	0.000013	0.000100	mg/L	0.00100	ND	94.7	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BJK0578-MSD1)						Source: 21K0245-02 Prepared: 22-Nov-2021 Analyzed: 23-Nov-2021 15:10					
Mercury, Dissolved	0.000899	0.000013	0.000100	mg/L	0.00100	ND	89.9	75-125	5.19	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											


 Shannon & Wilson, Inc
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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0635 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0635-BLK1)						Prepared: 23-Nov-2021 Analyzed: 24-Nov-2021 17:55						
Barium, Dissolved	135	ND	0.114	0.500	ug/L							U
Barium, Dissolved	137	ND	0.0765	0.500	ug/L							U
Chromium, Dissolved	52	ND	0.260	0.500	ug/L							U
Chromium, Dissolved	53	ND	0.239	0.500	ug/L							U
Iron, Dissolved	54	ND	18.2	36.0	ug/L							U
Iron, Dissolved	57	ND	18.2	36.0	ug/L							U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L							U
Manganese, Dissolved	55	ND	0.142	0.500	ug/L							U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L							U
Vanadium, Dissolved	51a	ND	0.0556	0.200	ug/L							U
Vanadium, Dissolved	51b	ND	0.0521	0.200	ug/L							U
Arsenic, Dissolved	75a	ND	0.0373	0.200	ug/L							U
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L							U
Cadmium, Dissolved	114	ND	0.0400	0.100	ug/L							U
Cobalt, Dissolved	59	ND	0.0178	0.200	ug/L							U
Copper, Dissolved	63	ND	0.173	0.500	ug/L							U
Copper, Dissolved	65	ND	0.350	0.500	ug/L							U
Nickel, Dissolved	60	ND	0.0792	0.500	ug/L							U
Nickel, Dissolved	62	ND	0.220	0.500	ug/L							U
Selenium, Dissolved	78	ND	0.179	0.500	ug/L							U
Zinc, Dissolved	66	ND	2.92	6.00	ug/L							U
Zinc, Dissolved	67	ND	0.940	6.00	ug/L							U
LCS (BJK0635-BS1)						Prepared: 23-Nov-2021 Analyzed: 24-Nov-2021 17:59						
Barium, Dissolved	135	23.7	0.114	0.500	ug/L	25.0		94.8	80-120			
Barium, Dissolved	137	24.0	0.0765	0.500	ug/L	25.0		95.9	80-120			
Chromium, Dissolved	52	23.8	0.260	0.500	ug/L	25.0		95.0	80-120			
Chromium, Dissolved	53	24.1	0.239	0.500	ug/L	25.0		96.3	80-120			
Iron, Dissolved	54	4900	18.2	36.0	ug/L	5000		98.0	80-120			
Iron, Dissolved	57	4960	18.2	36.0	ug/L	5000		99.2	80-120			
Lead, Dissolved	208	25.4	0.0513	0.100	ug/L	25.0		102	80-120			
Manganese, Dissolved	55	24.3	0.142	0.500	ug/L	25.0		97.1	80-120			
Silver, Dissolved	107	26.3	0.0220	0.200	ug/L	25.0		105	80-120			
Vanadium, Dissolved	51a	23.7	0.0556	0.200	ug/L	25.0		95.0	80-120			
Vanadium, Dissolved	51b	23.8	0.0521	0.200	ug/L	25.0		95.4	80-120			


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0635 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BJK0635-BS1)						Prepared: 23-Nov-2021 Analyzed: 24-Nov-2021 17:59						
Arsenic, Dissolved	75a	24.1	0.0373	0.200	ug/L	25.0		96.4	80-120			
Cadmium, Dissolved	111	24.5	0.0300	0.100	ug/L	25.0		98.1	80-120			
Cadmium, Dissolved	114	24.8	0.0400	0.100	ug/L	25.0		99.3	80-120			
Cobalt, Dissolved	59	24.6	0.0178	0.200	ug/L	25.0		98.4	80-120			
Copper, Dissolved	63	24.7	0.173	0.500	ug/L	25.0		98.9	80-120			
Copper, Dissolved	65	24.7	0.350	0.500	ug/L	25.0		98.7	80-120			
Nickel, Dissolved	60	24.8	0.0792	0.500	ug/L	25.0		99.3	80-120			
Nickel, Dissolved	62	24.3	0.220	0.500	ug/L	25.0		97.3	80-120			
Selenium, Dissolved	78	77.7	0.179	0.500	ug/L	80.0		97.1	80-120			
Zinc, Dissolved	66	77.1	2.92	6.00	ug/L	80.0		96.3	80-120			
Zinc, Dissolved	67	77.1	0.940	6.00	ug/L	80.0		96.4	80-120			
Duplicate (BJK0635-DUP1)						Source: 21K0245-02 Prepared: 23-Nov-2021 Analyzed: 24-Nov-2021 18:22						
Barium, Dissolved	135	3.40	0.114	0.500	ug/L		3.30			2.84	20	
Chromium, Dissolved	52	ND	0.260	0.500	ug/L		ND					U
Lead, Dissolved	208	ND	0.0513	0.100	ug/L		ND					U
Silver, Dissolved	107	ND	0.0220	0.200	ug/L		ND					U
Vanadium, Dissolved	51a	0.233	0.0556	0.200	ug/L		0.251			7.44	20	
Arsenic, Dissolved	75a	7.05	0.0373	0.200	ug/L		6.95			1.40	20	
Cadmium, Dissolved	111	ND	0.0300	0.100	ug/L		ND					U
Cobalt, Dissolved	59	0.441	0.0178	0.200	ug/L		0.454			2.91	20	
Copper, Dissolved	63	ND	0.173	0.500	ug/L		ND					U
Nickel, Dissolved	60	0.342	0.0792	0.500	ug/L		0.366			6.78	20	J
Selenium, Dissolved	78	0.222	0.179	0.500	ug/L		ND					J
Zinc, Dissolved	66	ND	2.92	6.00	ug/L		ND					U
Duplicate (BJK0635-DUP2)						Source: 21K0245-02 Prepared: 23-Nov-2021 Analyzed: 29-Nov-2021 19:49						
Iron, Dissolved	57	42000	364	720	ug/L		41700			0.68	20	D
Manganese, Dissolved	55	1490	2.84	10.0	ug/L		1500			0.90	20	D
Matrix Spike (BJK0635-MS1)						Source: 21K0245-02 Prepared: 23-Nov-2021 Analyzed: 24-Nov-2021 18:26						
Barium, Dissolved	135	27.9	0.114	0.500	ug/L	25.0	3.30	98.4	75-125			
Chromium, Dissolved	52	18.8	0.260	0.500	ug/L	25.0	ND	75.3	75-125			
Lead, Dissolved	208	25.5	0.0513	0.100	ug/L	25.0	ND	102	75-125			
Silver, Dissolved	107	25.5	0.0220	0.200	ug/L	25.0	ND	102	75-125			


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0635 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: SKD

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BJK0635-MS1)		Source: 21K0245-02			Prepared: 23-Nov-2021		Analyzed: 24-Nov-2021 18:26					
Vanadium, Dissolved	51a	19.4	0.0556	0.200	ug/L	25.0	0.251	76.5	75-125			
Arsenic, Dissolved	75a	30.7	0.0373	0.200	ug/L	25.0	6.95	95.0	75-125			
Cadmium, Dissolved	111	23.0	0.0300	0.100	ug/L	25.0	ND	92.2	75-125			
Cobalt, Dissolved	59	24.5	0.0178	0.200	ug/L	25.0	0.454	96.4	75-125			
Copper, Dissolved	63	23.7	0.173	0.500	ug/L	25.0	ND	94.7	75-125			
Nickel, Dissolved	60	24.1	0.0792	0.500	ug/L	25.0	0.366	94.9	75-125			
Selenium, Dissolved	78	71.2	0.179	0.500	ug/L	80.0	ND	89.0	75-125			
Zinc, Dissolved	66	73.4	2.92	6.00	ug/L	80.0	ND	91.7	75-125			

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

Matrix Spike (BJK0635-MS2)		Source: 21K0245-02			Prepared: 23-Nov-2021		Analyzed: 29-Nov-2021 19:53					
Iron, Dissolved	57	47500	364	720	ug/L	5000	41700	115	75-125			D
Manganese, Dissolved	55	1520	2.84	10.0	ug/L	25.0	1500	80.2	75-125			D

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

Matrix Spike Dup (BJK0635-MSD1)		Source: 21K0245-02			Prepared: 23-Nov-2021		Analyzed: 24-Nov-2021 18:32					
Barium, Dissolved	135	27.6	0.114	0.500	ug/L	25.0	3.30	97.2	75-125	1.07	20	
Chromium, Dissolved	52	18.5	0.260	0.500	ug/L	25.0	ND	74.0	75-125	1.73	20	*
Lead, Dissolved	208	24.7	0.0513	0.100	ug/L	25.0	ND	98.7	75-125	3.19	20	
Silver, Dissolved	107	24.6	0.0220	0.200	ug/L	25.0	ND	98.2	75-125	3.64	20	
Vanadium, Dissolved	51a	19.1	0.0556	0.200	ug/L	25.0	0.251	75.6	75-125	1.23	20	
Arsenic, Dissolved	75a	30.8	0.0373	0.200	ug/L	25.0	6.95	95.3	75-125	0.23	20	
Cadmium, Dissolved	111	23.3	0.0300	0.100	ug/L	25.0	ND	93.3	75-125	1.26	20	
Cobalt, Dissolved	59	24.9	0.0178	0.200	ug/L	25.0	0.454	97.7	75-125	1.39	20	
Copper, Dissolved	63	23.7	0.173	0.500	ug/L	25.0	ND	95.0	75-125	0.25	20	
Nickel, Dissolved	60	24.0	0.0792	0.500	ug/L	25.0	0.366	94.7	75-125	0.26	20	
Selenium, Dissolved	78	73.5	0.179	0.500	ug/L	80.0	ND	91.8	75-125	3.16	20	
Zinc, Dissolved	66	73.7	2.92	6.00	ug/L	80.0	ND	92.1	75-125	0.44	20	

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

Matrix Spike Dup (BJK0635-MSD2)		Source: 21K0245-02			Prepared: 23-Nov-2021		Analyzed: 29-Nov-2021 19:58					
Iron, Dissolved	57	47800	364	720	ug/L	5000	41700	121	75-125	0.59	20	D
Manganese, Dissolved	55	1520	2.84	10.0	ug/L	25.0	1500	83.8	75-125	0.06	20	D

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


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Metals and Metallic Compounds (dissolved) - Quality Control
Batch BJK0635 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Post Spike (BJK0635-PS1)			Source: 21K0245-02			Prepared: 23-Nov-2021			Analyzed: 13-Dec-2021 16:39			
Chromium, Dissolved	52	40.4			ug/L	49.5	ND	81.6	80-120			D


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Wet Chemistry - Quality Control
Batch BJK0349 - No Prep Wet Chem

Instrument: N/A

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0349-BLK1)					Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 17:03					
Sulfite	ND	1.4	1.4	mg/L						U
LCS (BJK0349-BS1)					Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 17:03					
Sulfite	3.9	1.4	1.4	mg/L	5.02		78.4 75-100			
Duplicate (BJK0349-DUP1)					Source: 21K0245-01 Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 17:03					
Sulfite	ND	1.4	1.4	mg/L		ND				H, U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Wet Chemistry - Quality Control
Batch BJK0350 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: CKI

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0350-BLK1)						Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 18:24					
Ferrous Iron	ND	0.040	0.040	mg/L							U
LCS (BJK0350-BS1)						Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 18:25					
Ferrous Iron	0.491	0.040	0.040	mg/L	0.500		98.3	90-110			
Duplicate (BJK0350-DUP1)						Source: 21K0245-01 Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 18:48					
Ferrous Iron	84.4	2.00	2.00	mg/L		84.7			0.30	20	D
Matrix Spike (BJK0350-MS2)						Source: 21K0245-01 Prepared: 12-Nov-2021 Analyzed: 12-Nov-2021 19:17					
Ferrous Iron	96.4	2.00	4.00	mg/L	20.0	84.7	58.8	75-125			HC, D

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


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Wet Chemistry - Quality Control
Batch BJK0353 - No Prep Wet Chem

Instrument: IC930 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BJK0353-BLK2)					Prepared: 12-Nov-2021 Analyzed: 20-Nov-2021 00:16						
Chloride	ND	0.100	0.100	mg/L							U
Nitrate-N	ND	0.100	0.100	mg/L							U
Nitrite-N	ND	0.100	0.100	mg/L							U
Blank (BJK0353-BLK3)					Prepared: 12-Nov-2021 Analyzed: 03-Dec-2021 03:36						
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BJK0353-BS2)					Prepared: 12-Nov-2021 Analyzed: 20-Nov-2021 00:36						
Chloride	4.89	0.100	0.100	mg/L	5.00		97.7	90-110			
Nitrate-N	4.98	0.100	0.100	mg/L	5.00		99.5	90-110			
Nitrite-N	5.09	0.100	0.100	mg/L	5.00		102	90-110			
LCS (BJK0353-BS3)					Prepared: 12-Nov-2021 Analyzed: 03-Dec-2021 03:56						
Sulfate	5.13	0.100	0.100	mg/L	5.00		103	90-110			
Duplicate (BJK0353-DUP1)					Source: 21K0245-01 Prepared: 12-Nov-2021 Analyzed: 13-Nov-2021 03:25						
Nitrate-N	ND	0.100	0.100	mg/L		ND					U
Nitrite-N	ND	0.100	0.100	mg/L		ND					U
Duplicate (BJK0353-DUP2)					Source: 21K0245-01RE1 Prepared: 12-Nov-2021 Analyzed: 20-Nov-2021 01:16						
Nitrate-N	ND	0.100	0.100	mg/L		ND					H, U
Nitrite-N	ND	0.100	0.100	mg/L		ND					H, U
Duplicate (BJK0353-DUP3)					Source: 21K0245-01RE3 Prepared: 12-Nov-2021 Analyzed: 22-Nov-2021 22:07						
Chloride	46.9	1.00	1.00	mg/L		46.7			0.50	20	D
Duplicate (BJK0353-DUP4)					Source: 21K0245-01RE4 Prepared: 12-Nov-2021 Analyzed: 03-Dec-2021 04:36						
Sulfate	5.19	0.100	0.100	mg/L		4.96			4.49	20	
Matrix Spike (BJK0353-MS1)					Source: 21K0245-01 Prepared: 12-Nov-2021 Analyzed: 13-Nov-2021 03:45						
Nitrate-N	1.93	0.100	0.100	mg/L	2.00	ND	96.5	75-125			
Nitrite-N	1.71	0.100	0.100	mg/L	2.01	ND	85.4	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
DL (BJK0353-MS2)					Source: 21K0245-01RE1 Prepared: 12-Nov-2021 Analyzed: 20-Nov-2021 01:36						
Nitrate-N	1.97	0.100	0.100	mg/L	2.00	ND	98.3	75-125			H
Nitrite-N	1.74	0.100	0.100	mg/L	2.01	ND	86.6	75-125			H


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Analysis by: Analytical Resources, LLC
Wet Chemistry - Quality Control
Batch BJK0353 - No Prep Wet Chem

Instrument: IC930 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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DL (BJK0353-MS2) **Source: 21K0245-01RE1** Prepared: 12-Nov-2021 Analyzed: 20-Nov-2021 01:36

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

Matrix Spike (BJK0353-MS3) **Source: 21K0245-01RE3** Prepared: 12-Nov-2021 Analyzed: 22-Nov-2021 23:27

Chloride	123	5.00	5.00	mg/L	100	46.7	76.3	75-125			D
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BJK0353-MS4) **Source: 21K0245-01RE4** Prepared: 12-Nov-2021 Analyzed: 03-Dec-2021 04:56

Sulfate	6.97	0.100	0.100	mg/L	2.00	4.96	100	75-125			
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.


 Shannon & Wilson, Inc
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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 17-Dec-2021 15:29

Certified Analyses included in this Report

Analyte	Certifications
EPA 300.0 in Water	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrate-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
EPA 6020B in Water	
Silver-107	WADOE,WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
Silver-107	WA-DW,DoD-ELAP,NELAP
Barium-135	NELAP,WADOE,DoD-ELAP,ADEC
Barium-137	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-52	NELAP,WADOE,DoD-ELAP,ADEC
Chromium-53	NELAP,WADOE,DoD-ELAP,ADEC
Iron-54	NELAP,WADOE,DoD-ELAP
Iron-57	NELAP,WADOE,DoD-ELAP
Manganese-55	NELAP,WADOE,DoD-ELAP
Lead-208	NELAP,WADOE,DoD-ELAP,ADEC
Vanadium-51a	NELAP,DoD-ELAP,WADOE,ADEC
Vanadium-51b	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Water	
Arsenic-75a	WADOE,WA-DW,DoD-ELAP,ADEC,NELAP
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	NELAP,DoD-ELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP


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Project: Lower Duwamish Q4

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17-Dec-2021 15:29

Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	WADOE,WA-DW,DoD-ELAP
Zinc-67	WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-111	NELAP,WADOE,DoD-ELAP,ADEC
Cadmium-114	NELAP,WADOE,DoD-ELAP,ADEC
Cobalt-59	DoD-ELAP,NELAP,WADOE
Copper-63	NELAP,WADOE,DoD-ELAP
Copper-65	NELAP,WADOE,DoD-ELAP
Nickel-60	NELAP,WADOE,DoD-ELAP,ADEC
Nickel-62	NELAP,WADOE,DoD-ELAP,ADEC
Selenium-78	NELAP,WADOE,DoD-ELAP
Zinc-66	NELAP,WADOE,DoD-ELAP
Zinc-67	NELAP,WADOE,DoD-ELAP

EPA 7470A in Water

Mercury	WADOE,NELAP,DoD-ELAP
Mercury	WADOE,NELAP,DoD-ELAP

EPA 8082A in Water

Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
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 17-Dec-2021 15:29

EPA 8260D in Water

Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

Project Manager: Meg Strong

Reported:

17-Dec-2021 15:29

Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

EPA 8260D-SIM in Water

Acrylonitrile	NELAP,WADOE
Vinyl chloride	NELAP,WADOE


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1,1-Dichloroethene	NELAP,WADOE
cis-1,2-Dichloroethene	NELAP,WADOE
trans-1,2-Dichloroethene	NELAP,WADOE
Trichloroethene	NELAP,WADOE
Tetrachloroethene	NELAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,WADOE
1,2-Dichloroethane	NELAP,WADOE
Benzene	NELAP,WADOE

EPA 8270E in Water

Phenol	NELAP,DoD-ELAP
bis(2-chloroethyl) ether	NELAP,DoD-ELAP
2-Chlorophenol	NELAP,DoD-ELAP
1,3-Dichlorobenzene	NELAP,DoD-ELAP
1,4-Dichlorobenzene	NELAP,DoD-ELAP
1,2-Dichlorobenzene	NELAP,DoD-ELAP
Benzyl Alcohol	NELAP,DoD-ELAP
2,2'-Oxybis(1-chloropropane)	NELAP,DoD-ELAP
2-Methylphenol	NELAP,DoD-ELAP
Hexachloroethane	NELAP,DoD-ELAP
N-Nitroso-di-n-Propylamine	NELAP,DoD-ELAP
4-Methylphenol	NELAP,DoD-ELAP
Nitrobenzene	NELAP,DoD-ELAP
Isophorone	NELAP,DoD-ELAP
2-Nitrophenol	NELAP,DoD-ELAP
2,4-Dimethylphenol	NELAP,DoD-ELAP
Bis(2-Chloroethoxy)methane	NELAP,DoD-ELAP
2,4-Dichlorophenol	NELAP,DoD-ELAP
1,2,4-Trichlorobenzene	NELAP,DoD-ELAP
Naphthalene	NELAP,DoD-ELAP
Benzoic acid	NELAP,DoD-ELAP
4-Chloroaniline	NELAP,DoD-ELAP
Hexachlorobutadiene	NELAP,DoD-ELAP
4-Chloro-3-Methylphenol	NELAP,DoD-ELAP
2-Methylnaphthalene	NELAP,DoD-ELAP
Hexachlorocyclopentadiene	NELAP,DoD-ELAP
2,4,6-Trichlorophenol	NELAP,DoD-ELAP
2,4,5-Trichlorophenol	NELAP,DoD-ELAP
2-Chloronaphthalene	NELAP,DoD-ELAP
2-Nitroaniline	NELAP,DoD-ELAP


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Acenaphthylene	NELAP,DoD-ELAP
Dimethylphthalate	NELAP,DoD-ELAP
2,6-Dinitrotoluene	NELAP,DoD-ELAP
Acenaphthene	NELAP,DoD-ELAP
3-Nitroaniline	NELAP,DoD-ELAP
2,4-Dinitrophenol	NELAP,DoD-ELAP
Dibenzofuran	NELAP,DoD-ELAP
4-Nitrophenol	NELAP,DoD-ELAP
2,4-Dinitrotoluene	NELAP,DoD-ELAP
Fluorene	NELAP,DoD-ELAP
4-Chlorophenylphenyl ether	NELAP,DoD-ELAP
Diethyl phthalate	NELAP,DoD-ELAP
4-Nitroaniline	NELAP,DoD-ELAP
4,6-Dinitro-2-methylphenol	NELAP,DoD-ELAP
N-Nitrosodiphenylamine	NELAP,DoD-ELAP
4-Bromophenyl phenyl ether	NELAP,DoD-ELAP
Hexachlorobenzene	NELAP,DoD-ELAP
Pentachlorophenol	NELAP,DoD-ELAP
Phenanthrene	NELAP,DoD-ELAP
Anthracene	NELAP,DoD-ELAP
Carbazole	NELAP,DoD-ELAP
Di-n-Butylphthalate	NELAP,DoD-ELAP
Fluoranthene	NELAP,DoD-ELAP
Pyrene	NELAP,DoD-ELAP
Butylbenzylphthalate	NELAP,DoD-ELAP
Benzo(a)anthracene	NELAP,DoD-ELAP
3,3'-Dichlorobenzidine	NELAP,DoD-ELAP
Chrysene	NELAP,DoD-ELAP
bis(2-Ethylhexyl)phthalate	NELAP,DoD-ELAP
Di-n-Octylphthalate	NELAP,DoD-ELAP
Benzo(b)fluoranthene	NELAP,DoD-ELAP
Benzo(k)fluoranthene	NELAP,DoD-ELAP
Benzofluoranthenes, Total	NELAP
Benzo(a)pyrene	NELAP,DoD-ELAP
Indeno(1,2,3-cd)pyrene	NELAP,DoD-ELAP
Dibenzo(a,h)anthracene	NELAP,DoD-ELAP
Benzo(g,h,i)perylene	NELAP,DoD-ELAP
N-Nitrosodimethylamine	NELAP,DoD-ELAP
1-Methylnaphthalene	NELAP,DoD-ELAP



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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EPA 8270E-SIM in Water

Naphthalene	ADEC, DoD-ELAP, NELAP, WADOE
2-Methylnaphthalene	ADEC, DoD-ELAP, NELAP
1-Methylnaphthalene	ADEC, DoD-ELAP, NELAP, WADOE
Biphenyl	NELAP
Acenaphthylene	ADEC, DoD-ELAP, NELAP, WADOE
Acenaphthene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzofuran	ADEC, DoD-ELAP, NELAP
Fluorene	ADEC, DoD-ELAP, NELAP, WADOE
Phenanthrene	ADEC, DoD-ELAP, NELAP, WADOE
Anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Carbazole	NELAP
Fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(a)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Chrysene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(b)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(k)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(j)fluoranthene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(e)pyrene	NELAP
Benzo(a)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Perylene	ADEC, NELAP
Indeno(1,2,3-cd)pyrene	ADEC, DoD-ELAP, NELAP, WADOE
Dibenzo(a,h)anthracene	ADEC, DoD-ELAP, NELAP, WADOE
Benzo(g,h,i)perylene	ADEC, DoD-ELAP, NELAP, WADOE

EPA RSK-175 in Water

Methane	NELAP
Ethane	NELAP
Ethene	NELAP
Acetylene	NELAP

NWTPH-Dx in Water

Diesel Range Organics (C12-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP, NELAP, WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Diesel Range Organics (C12-C25)	DoD-ELAP


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Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

NWTPHg in Water

Gasoline Range Organics (Tol-Nap)	WADOE,DoD-ELAP
Gasoline Range Organics (2MP-TMB)	WADOE,DoD-ELAP
Gasoline Range Organics (Tol-C12)	WADOE,DoD-ELAP
Gasoline Range Organics (C6-C10)	WADOE,ADEC,DoD-ELAP
Gasoline Range Organics (C5-C12)	WADOE,DoD-ELAP

SM 3500-Fe B-97 in Water

Ferrous Iron	WADOE,NELAP
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SM 4500-SO3 B-00 in Water

Sulfite	WADOE,NELAP
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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
H	Hold time violation - Hold time was exceeded.
HC	The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
J	Estimated concentration value detected below the reporting limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
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.



Analytical Resources, LLC
Analytical Chemists and Consultants

03 December 2021

Meg Strong
Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle, WA 98103-8636

RE: Lower Duwamish Q4

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.

Associated Work Order(s)
21K0284

Associated SDG ID(s)
N/A

Digitally signed by
Shelly Fishel
Date: 2021.12.03
19:51:09 -08'00'

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 enclose 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, LLC

Shelly Fishel, Project Manager

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: 21K0284		Turn-around Requested: Standard		Page: 1 of 1																																																																																																																																																																										
ARI Client Company: Shannon & Wilson, Inc.		Phone:		Date: 11/16/21	Ice Present?																																																																																																																																																																									
Client Contact: Shashana Howard		No. of Coolers: 3		Cooler Temps: 1.8, 5.1, 4.5																																																																																																																																																																										
Client Project Name: LDW		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="12">Analysis Requested</th> <th>Notes/Comments</th> </tr> <tr> <th>TPH-G</th> <th>TPH-DX</th> <th>BTEX</th> <th>HVOCs</th> <th>MTBE</th> <th>PAHs</th> <th>SVOCs (Full)</th> <th>SVOCs (L.L.)</th> <th>PCBs Aroclors</th> <th>Metals (T+D)</th> <th>Hex. Chrome</th> <th>NAP</th> <th></th> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>①</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>②</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td>③</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>③</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>X</td> <td>③</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td></td> <td></td> <td>X</td> <td>③</td> <td></td> <td></td> <td></td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>				Analysis Requested												Notes/Comments	TPH-G	TPH-DX	BTEX	HVOCs	MTBE	PAHs	SVOCs (Full)	SVOCs (L.L.)	PCBs Aroclors	Metals (T+D)	Hex. Chrome	NAP			X	X	X		X	X		X	①					X	X	X					X	②						X	X											X	X	X		X			X	③					X	X	X		X	X	X	X	③					X	X	X			X		X	③					X	X	X		X			X	③																																																							
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Client Project #: 21-1-12596		Samplers: CTC, RMV																																																																																																																																																																												

Sample ID	Date	Time	Matrix	No. Containers	TPH-G	TPH-DX	BTEX	HVOCs	MTBE	PAHs	SVOCs (Full)	SVOCs (L.L.)	PCBs Aroclors	Metals (T+D)	Hex. Chrome	NAP		
MW-43-20211611	11/16	0945	GW	11		X	X	X		X	X		X	①				① Mn
MW-44-20211611	11/16	1030	GW	11		X	X	X					X	②				② Mn, Hg
TB-5-20211611	11/16	1040	W	5			X	X										③ As, Ba, Cr, Mn, Ni, Cd, Co, Cu, Fe, Pb, Hg, Se, Ag, V, Zn
MW-71-20211611	11/16	1140	GW	15	X	X	X	X		X			X	③				
EB-2-20211611	11/16	1150	W	17	X	X	X	X		X	X	X	X	③				
MW-63-20211611	11/16	1336	GW	13		X	X	X			X		X	③				
MW-64-20211611	11/16	1447	GW	13		X	X	X		X			X	③				

Comments/Special Instructions * Metals are not field filtered	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Christian Cantello	Printed Name: Dimitri Comradze	Printed Name:	Printed Name:
	Company: Shannon & Wilson	Company: ARI	Company:	Company:
	Date & Time: 11/16/21 1625	Date & Time: 11/16/21 1625	Date & Time:	Date & Time:



Analytical Resources, Incorporated
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 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 19:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-43-20211611	21K0284-01	Water	16-Nov-2021 09:45	16-Nov-2021 16:25
MW-43-20211611	21K0284-02	Water	16-Nov-2021 09:45	16-Nov-2021 16:25
MW-44-20211611	21K0284-03	Water	16-Nov-2021 10:30	16-Nov-2021 16:25
MW-44-20211611	21K0284-04	Water	16-Nov-2021 10:30	16-Nov-2021 16:25
TB-5-20211611	21K0284-05	Water	16-Nov-2021 09:45	16-Nov-2021 16:25
MW-71-20211611	21K0284-06	Water	16-Nov-2021 11:40	16-Nov-2021 16:25
MW-71-20211611	21K0284-07	Water	16-Nov-2021 11:40	16-Nov-2021 16:25
EB-2-20211611	21K0284-08	Water	16-Nov-2021 11:50	16-Nov-2021 16:25
EB-2-20211611	21K0284-09	Water	16-Nov-2021 11:50	16-Nov-2021 16:25
MW-63-20211611	21K0284-10	Water	16-Nov-2021 13:36	16-Nov-2021 16:25
MW-63-20211611	21K0284-11	Water	16-Nov-2021 13:36	16-Nov-2021 16:25
MW-64-20211611	21K0284-12	Water	16-Nov-2021 14:47	16-Nov-2021 16:25
MW-64-20211611	21K0284-13	Water	16-Nov-2021 14:47	16-Nov-2021 16:25



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

Work Order Case Narrative

Client: Shannon & Wilson, Inc
Project: Lower Duwamish Q4
Work Order: 21K0284

Sample receipt

Samples as listed on the preceding page were received 16-Nov-2021 16:25 under ARI work order 21K0284. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except surrogate Decachlorobiphenyl which was out of control high in the initial calibration verification SJL0010-ICV1 on column zb-5. Data reported from passing column zb-35.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Gasoline by NWTPH-g (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method SW8260D



Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Volatiles - EPA Method 8260D-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except 1,2-Dichloroethane-d4 which was out of control low in the blank spike duplicate BJK0666-BSD1 and has been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. 4-Chlorophenylphenyl ether, Fluorene, Hexachlorocyclopentadiene, and Pentachlorophenol which were out of control low and 2,4-Dinitrotoluene, 2-Nitrophenol, Butylbenzylphthalate, Fluoranthene, Pyrene and surrogate p-Terphenyl-d14 which were out of control high in the initial calibration verification SJL0050-ICV1. All samples which contain analyte have been flagged with a "Q" qualifier. Hexachlorocyclopentadiene and Pentachlorophenol which were out of control low and Fluoranthene and Pyrene were out of control high in the continuing calibration verification SJL0050-CCV1. 2,4-Dinitrophenol, 4,6-Dinitro-2-methylphenol, Benzo(g,h,i)perylene, Benzoic acid, Hexachlorocyclopentadiene and Pentachlorophenol which were out of control low in low concentration calibration verification SJL0050-LCV1. 4,6-Dinitro-2-methylphenol, Benzoic acid and Pentachlorophenol were out of control low and internal standard Chrysene-d12 which was out of control high in the low concentration calibration verification SJL0050-LCV2.


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 19:31

Internal standard areas were within limits except Chrysene-d12 which was out of control high in the low concentration calibration verification SJL0050-LCV2.

The surrogate percent recoveries were within control limits except p-Terphenyl-d14 which was out of control high in the initial calibration verification SJL0050-ICV1 and has been "Q" qualified. Phenol-d5 was out of control low in sample 21K0284-08 and has been flagged.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries except Benzoic Acid, 4-Chloroaniline, Hexachlorocyclopentadiene and 4-Nitrophenol which were out of control low in the blank spike BJK0540-BS1 and 4-Chloroaniline was out of control low in the blank spike duplicate BJK0540-BSD1. The BS/ BSD relative percent difference (RPD) were within advisory control limits except 2,4-Dinitrophenol, Hexachlorocyclopentadiene and 4-Chlorophenylphenyl ether. Deviations have been flagged.

Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

Total and Dissolved Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0284-08 in Total Metals batch BJK0731 and in association with sample 21K0284-09 in Dissolved Metals batch BJK0487. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.



Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

Total and Dissolved Mercury - EPA Method 7470/7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Sample specific QC was performed in association with sample 21K0284-08 in Total Mercury batch BJK0611 and in association with sample 21K0284-04 in Dissolved Mercury batch BJK0027. The duplicate (DUP) relative percent difference (RPD) were within advisory control limits. The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.



WORK ORDER

21K0284

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0284-01 A	Glass NM, Amber, 1000 mL		
21K0284-01 B	Glass NM, Amber, 1000 mL		
21K0284-01 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-01 D	Glass NM, Amber, 500 mL		
21K0284-01 E	Glass NM, Amber, 500 mL		
21K0284-01 F	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 G	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-02 A	HDPE NM, 500 mL	>2	Fail
21K0284-03 A	Glass NM, Amber, 1000 mL		
21K0284-03 B	Glass NM, Amber, 1000 mL		
21K0284-03 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-03 D	Glass NM, Amber, 500 mL		
21K0284-03 E	Glass NM, Amber, 500 mL		
21K0284-03 F	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 G	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-04 A	HDPE NM, 500 mL	>2	Fail
21K0284-05 A	VOA Vial, Clear, 40 mL, HCL		
21K0284-05 B	VOA Vial, Clear, 40 mL, HCL		
21K0284-05 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0284-05 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0284-05 E	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0284-06 A	Glass NM, Amber, 1000 mL		
21K0284-06 B	Glass NM, Amber, 1000 mL		
21K0284-06 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-06 D	Glass NM, Amber, 500 mL		
21K0284-06 E	Glass NM, Amber, 500 mL		
21K0284-06 F	Glass NM, Amber, 500 mL		
21K0284-06 G	Glass NM, Amber, 500 mL		



WORK ORDER

21K0284

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

21K0284-06 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-06 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-06 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-06 K	VOA Vial, Clear, 40 mL, HCL		
21K0284-06 L	VOA Vial, Clear, 40 mL, HCL		
21K0284-06 M	VOA Vial, Clear, 40 mL, HCL		
21K0284-06 N	VOA Vial, Clear, 40 mL, HCL		
21K0284-07 A	HDPE NM, 500 mL	>2	Fail
21K0284-08 A	Glass NM, Amber, 1000 mL		
21K0284-08 B	Glass NM, Amber, 1000 mL		
21K0284-08 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-08 D	Glass NM, Amber, 500 mL		
21K0284-08 E	Glass NM, Amber, 500 mL		
21K0284-08 F	Glass NM, Amber, 500 mL		
21K0284-08 G	Glass NM, Amber, 500 mL		
21K0284-08 H	Glass NM, Amber, 500 mL		
21K0284-08 I	Glass NM, Amber, 500 mL		
21K0284-08 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-08 K	VOA Vial, Clear, 40 mL, HCL		
21K0284-08 L	VOA Vial, Clear, 40 mL, HCL		
21K0284-08 M	VOA Vial, Clear, 40 mL, HCL		
21K0284-08 N	VOA Vial, Clear, 40 mL, HCL		
21K0284-08 O	VOA Vial, Clear, 40 mL, HCL		
21K0284-08 P	VOA Vial, Clear, 40 mL, HCL		
21K0284-09 A	HDPE NM, 500 mL	>2	Fail
21K0284-10 A	Glass NM, Amber, 1000 mL		
21K0284-10 B	Glass NM, Amber, 1000 mL		
21K0284-10 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-10 D	Glass NM, Amber, 500 mL		
21K0284-10 E	Glass NM, Amber, 500 mL		
21K0284-10 F	Glass NM, Amber, 500 mL		
21K0284-10 G	Glass NM, Amber, 500 mL		
21K0284-10 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-10 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-10 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-10 K	VOA Vial, Clear, 40 mL, HCL		



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WORK ORDER

21K0284

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

21K0284-10 L	VOA Vial, Clear, 40 mL, HCL		
21K0284-11 A	HDPE NM, 500 mL	>2	Fail
21K0284-12 A	Glass NM, Amber, 1000 mL		
21K0284-12 B	Glass NM, Amber, 1000 mL		
21K0284-12 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-12 D	Glass NM, Amber, 500 mL		
21K0284-12 E	Glass NM, Amber, 500 mL		
21K0284-12 F	Glass NM, Amber, 500 mL		
21K0284-12 G	Glass NM, Amber, 500 mL		
21K0284-12 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 K	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 L	VOA Vial, Clear, 40 mL, HCL		
21K0284-13 A	HDPE NM, 500 mL	>2	Fail

RB

Preservation Confirmed By

11/17/21

Date

Reviewed By

Date



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Shannon & Wilson

Project Name: CDW

COC No(s): _____ NA

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

Assigned ARI Job No: 21K0284

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the 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) 1.8 5.1 4.5

Time 1625

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DOO 2565

Cooler Accepted by: RL Date: 11/16/21 Time: 1625

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

How were bottles sealed in plastic bags? RD 11/17/21 Individually Grouped Not

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 10/27/21

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: RL Date: 11/17/21 Time: 1000 Labels checked by: _____

**** 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:

lab to determine size of bubbles

By: RL Date: 11/17/21



WORK ORDER

21K0284

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

Preservation Confirmation

Container ID	Container Type	pH	
21K0284-01 A	Glass NM, Amber, 1000 mL		
21K0284-01 B	Glass NM, Amber, 1000 mL		
21K0284-01 C	HDPE NM, 500 mL, 1:1 HNO3	✓2	Pass
21K0284-01 D	Glass NM, Amber, 500 mL		
21K0284-01 E	Glass NM, Amber, 500 mL		
21K0284-01 F	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 G	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-01 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-02 A	HDPE NM, 500 mL	>2	Fail (1)
21K0284-03 A	Glass NM, Amber, 1000 mL		
21K0284-03 B	Glass NM, Amber, 1000 mL		
21K0284-03 C	HDPE NM, 500 mL, 1:1 HNO3	✓2	Pass
21K0284-03 D	Glass NM, Amber, 500 mL		
21K0284-03 E	Glass NM, Amber, 500 mL		
21K0284-03 F	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 G	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-03 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-04 A	HDPE NM, 500 mL	>2	Fail (1)
21K0284-05 A	VOA Vial, Clear, 40 mL, HCL		
21K0284-05 B	VOA Vial, Clear, 40 mL, HCL		
21K0284-05 C	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0284-05 D	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0284-05 E	VOA Vial, Clear, 40 mL, HCL	bubble	
21K0284-06 A	Glass NM, Amber, 1000 mL		
21K0284-06 B	Glass NM, Amber, 1000 mL		
21K0284-06 C	HDPE NM, 500 mL, 1:1 HNO3	✓2	Pass
21K0284-06 D	Glass NM, Amber, 500 mL		
21K0284-06 E	Glass NM, Amber, 500 mL		
21K0284-06 F	Glass NM, Amber, 500 mL		
21K0284-06 G	Glass NM, Amber, 500 mL		



WORK ORDER

21K0284

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

21K0284-06 H	VOA Vial, Clear, 40 mL, HCL			
21K0284-06 I	VOA Vial, Clear, 40 mL, HCL			
21K0284-06 J	VOA Vial, Clear, 40 mL, HCL			
21K0284-06 K	VOA Vial, Clear, 40 mL, HCL			
21K0284-06 L	VOA Vial, Clear, 40 mL, HCL			
21K0284-06 M	VOA Vial, Clear, 40 mL, HCL			
21K0284-06 N	VOA Vial, Clear, 40 mL, HCL			
21K0284-07 A	HDPE NM, 500 mL	>2	Fail	①
21K0284-08 A	Glass NM, Amber, 1000 mL			
21K0284-08 B	Glass NM, Amber, 1000 mL			
21K0284-08 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass	
21K0284-08 D	Glass NM, Amber, 500 mL			
21K0284-08 E	Glass NM, Amber, 500 mL			
21K0284-08 F	Glass NM, Amber, 500 mL			
21K0284-08 G	Glass NM, Amber, 500 mL			
21K0284-08 H	Glass NM, Amber, 500 mL			
21K0284-08 I	Glass NM, Amber, 500 mL			
21K0284-08 J	VOA Vial, Clear, 40 mL, HCL			
21K0284-08 K	VOA Vial, Clear, 40 mL, HCL			
21K0284-08 L	VOA Vial, Clear, 40 mL, HCL			
21K0284-08 M	VOA Vial, Clear, 40 mL, HCL			
21K0284-08 N	VOA Vial, Clear, 40 mL, HCL			
21K0284-08 O	VOA Vial, Clear, 40 mL, HCL			
21K0284-08 P	VOA Vial, Clear, 40 mL, HCL			
21K0284-09 A	HDPE NM, 500 mL	>2	Fail	①
21K0284-10 A	Glass NM, Amber, 1000 mL			
21K0284-10 B	Glass NM, Amber, 1000 mL			
21K0284-10 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass	
21K0284-10 D	Glass NM, Amber, 500 mL			
21K0284-10 E	Glass NM, Amber, 500 mL			
21K0284-10 F	Glass NM, Amber, 500 mL			
21K0284-10 G	Glass NM, Amber, 500 mL			
21K0284-10 H	VOA Vial, Clear, 40 mL, HCL			
21K0284-10 I	VOA Vial, Clear, 40 mL, HCL			
21K0284-10 J	VOA Vial, Clear, 40 mL, HCL			
21K0284-10 K	VOA Vial, Clear, 40 mL, HCL			



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WORK ORDER

21K0284

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Shannon & Wilson, Inc

Project Manager: Shelly Fishel

Project: Lower Duwamish Q4

Project Number: 21-1-12596-012

21K0284-10 L	VOA Vial, Clear, 40 mL, HCL		
21K0284-11 A	HDPE NM, 500 mL	>2	Fail (1)
21K0284-12 A	Glass NM, Amber, 1000 mL		
21K0284-12 B	Glass NM, Amber, 1000 mL		
21K0284-12 C	HDPE NM, 500 mL, 1:1 HNO3	<2	Pass
21K0284-12 D	Glass NM, Amber, 500 mL		
21K0284-12 E	Glass NM, Amber, 500 mL		
21K0284-12 F	Glass NM, Amber, 500 mL		
21K0284-12 G	Glass NM, Amber, 500 mL		
21K0284-12 H	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 I	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 J	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 K	VOA Vial, Clear, 40 mL, HCL		
21K0284-12 L	VOA Vial, Clear, 40 mL, HCL		
21K0284-13 A	HDPE NM, 500 mL	>2	Fail (1)

RP

Preservation Confirmed By

Date

11/17/21

(1) Filtered at 0.45 microns
& preserved to pH < 2
with 0.75 mL conc. HNO₃
(510414) mm 11/17/21

Reviewed By

Date



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-43-20211611

21K0284-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/16/2021 09:45

Instrument: NT3 Analyst: PKC

Analyzed: 11/17/2021 19:04

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-01 F

Preparation Batch: BJK0451

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	0.28	ug/L	
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	0.16	ug/L	J
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>					<i>80-129 %</i>	<i>106 %</i>	
<i>Surrogate: Toluene-d8</i>					<i>80-120 %</i>	<i>102 %</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>					<i>80-120 %</i>	<i>108 %</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>					<i>80-120 %</i>	<i>100 %</i>	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-43-20211611
21K0284-01 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/16/2021 09:45

Instrument: FID4 Analyst: TWC

Analyzed: 11/27/2021 01:35

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 21K0284-01 D 01

Preparation Batch: BJK0537

Sample Size: 500 mL

Prepared: 11/22/2021

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	0.169	mg/L	
HC ID: DRO						
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	99.0	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 19:31

MW-43-20211611
21K0284-01 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/16/2021 09:45

Instrument: ECD7 Analyst: JGR

Analyzed: 11/30/2021 21:10

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0538 Prepared: 11/23/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0284-01 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0302 Cleaned: 29-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0284-01 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0300 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-01 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0301 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-01 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	72.8	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	73.0	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	73.8	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	76.7	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-43-20211611
21K0284-01 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/16/2021 09:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 19:06

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0731 Sample Size: 25 mL
 Prepared: 11/30/2021 Final Volume: 25 mL

Extract ID: 21K0284-01 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	5	0.710	2.50	284	ug/L	D



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-43-20211611

21K0284-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/16/2021 09:45

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 00:31

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0284-02 A 02

Preparation Batch: BJK0487

Sample Size: 25 mL

Filtration Batch: BJK0466

Prepared: 11/18/2021

Final Volume: 25 mL

Filtration Date: 11/17/2021 16:21

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	1	0.142	0.500	219	ug/L	



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-44-20211611

21K0284-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/16/2021 10:30

Instrument: NT3 Analyst: PKC

Analyzed: 11/17/2021 19:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-03 F

Preparation Batch: BJK0451

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	105	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	105	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-44-20211611
21K0284-03 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/16/2021 10:30

Instrument: NT7 Analyst: KOTT

Analyzed: 11/26/2021 18:58

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-03 I

Preparation Batch: BJK0666

Sample Size: 10 mL

Prepared: 11/24/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				<i>80-129 %</i>	<i>90.3</i>	<i>%</i>	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-44-20211611
21K0284-03 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/16/2021 10:30

Instrument: FID4 Analyst: TWC

Analyzed: 11/27/2021 01:55

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0537
 Prepared: 11/22/2021

 Sample Size: 500 mL
 Final Volume: 1 mL

Extract ID: 21K0284-03 D 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>103</i>	<i>%</i>	



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
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MW-44-20211611

21K0284-03 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 11/16/2021 10:30

Instrument: ECD7 Analyst: JGR

Analyzed: 11/30/2021 21:31

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0538 Prepared: 11/23/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0284-03 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0302 Cleaned: 29-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0284-03 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0300 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-03 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0301 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-03 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
Surrogate: Decachlorobiphenyl				29-120 %	62.2	%	
Surrogate: Tetrachlorometaxylene				32-120 %	78.0	%	
Surrogate: Decachlorobiphenyl [2C]				29-120 %	62.9	%	
Surrogate: Tetrachlorometaxylene [2C]				32-120 %	76.7	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-44-20211611
21K0284-03 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/16/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 20:23

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0731 Sample Size: 25 mL
 Prepared: 11/30/2021 Final Volume: 25 mL

Extract ID: 21K0284-03 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese	7439-96-5	50	7.10	25.0	1530	ug/L	D


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-44-20211611
21K0284-03 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/16/2021 10:30

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 15:39

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0284-03 C

Preparation Batch: BJK0611

Sample Size: 20 mL

Prepared: 11/23/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-44-20211611
21K0284-04 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/16/2021 10:30

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 17:58

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Extract ID: 21K0284-04 A 02

Preparation Batch: BJK0487

Sample Size: 25 mL

Filtration Batch: BJK0466

Prepared: 11/18/2021

Final Volume: 25 mL

Filtration Date: 11/17/2021 16:21

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Manganese, Dissolved	7439-96-5	20	2.84	10.0	1500	ug/L	D



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-44-20211611

21K0284-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/16/2021 10:30

Instrument: HYDRA Analyst: SKD

Analyzed: 12/02/2021 17:02

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0284-04 A 01

Preparation Batch: BJK0027

Sample Size: 20 mL

Filtration Batch: BJK0466

Prepared: 12/01/2021

Final Volume: 20 mL

Filtration Date: 11/17/2021 16:21

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	0.000018	mg/L	J



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

TB-5-20211611
21K0284-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/16/2021 09:45

Instrument: NT3 Analyst: PKC

Analyzed: 11/17/2021 15:10

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)
Preparation Batch: BJK0451
Prepared: 11/17/2021

Sample Size: 10 mL
Final Volume: 10 mL

Extract ID: 21K0284-05 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				<i>80-129 %</i>	<i>93.0</i>	<i>%</i>	
<i>Surrogate: Toluene-d8</i>				<i>80-120 %</i>	<i>104</i>	<i>%</i>	
<i>Surrogate: 4-Bromofluorobenzene</i>				<i>80-120 %</i>	<i>101</i>	<i>%</i>	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				<i>80-120 %</i>	<i>98.7</i>	<i>%</i>	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 19:31

TB-5-20211611
21K0284-05 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/16/2021 09:45

Instrument: NT7 Analyst: KOTT

Analyzed: 11/26/2021 18:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-05 C

Preparation Batch: BJK0666

Sample Size: 10 mL

Prepared: 11/24/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	92.8	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	90.8	%	



Analytical Report

Shannon & Wilson, Inc
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Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-71-20211611

21K0284-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/16/2021 11:40

Instrument: NT3 Analyst: PKC

Analyzed: 11/17/2021 19:55

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-06 H

Preparation Batch: BJK0451

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	98.0	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	99.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	105	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 19:31

MW-71-20211611
21K0284-06 (Water)
Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/16/2021 11:40

Instrument: NT3 Analyst: PKC

Analyzed: 11/22/2021 12:19

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-06 J

Preparation Batch: BJK0565

Sample Size: 10 mL

Prepared: 11/22/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	102	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	110	%	


 Shannon & Wilson, Inc
 400 N 34th St., Suite 100
 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-71-20211611
21K0284-06 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/16/2021 11:40

Instrument: NT7 Analyst: KOTT

Analyzed: 11/26/2021 19:27

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-06 I

Preparation Batch: BJK0666

Sample Size: 10 mL

Prepared: 11/24/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				<i>80-129 %</i>	<i>103</i>	<i>%</i>	



Analytical Report

Shannon & Wilson, Inc
400 N 34th St., Suite 100
Seattle WA, 98103-8636

Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-71-20211611

21K0284-06 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/16/2021 11:40

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 10:09

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0539 Prepared: 11/23/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0284-06 F 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0280 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0284-06 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.003	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.003	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.046	ug/L	
Dibenzofuran	132-64-9	1	0.002	0.010	0.002	ug/L	J
Fluorene	86-73-7	1	0.002	0.010	0.006	ug/L	J
Phenanthrene	85-01-8	1	0.001	0.010	0.003	ug/L	J
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	0.015	ug/L	
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10				42-120 %	85.9	%	
Surrogate: Dibenzo[a,h]anthracene-d14				29-120 %	69.3	%	
Surrogate: Fluoranthene-d10				57-120 %	98.0	%	


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 Project Number: 21-1-12596-012
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Reported:
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MW-71-20211611
21K0284-06 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/16/2021 11:40

Instrument: FID4 Analyst: TWC

Analyzed: 11/27/2021 02:14

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0537
 Prepared: 11/22/2021

 Sample Size: 500 mL
 Final Volume: 1 mL

Extract ID: 21K0284-06 D 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>80.1</i>	<i>%</i>	


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Reported:
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MW-71-20211611
21K0284-06 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/16/2021 11:40

Instrument: ECD7 Analyst: JGR

Analyzed: 11/30/2021 21:52

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0538 Prepared: 11/23/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0284-06 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0302 Cleaned: 29-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0284-06 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0300 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-06 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0301 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-06 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	91.6	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	87.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	99.9	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	86.3	%	


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Reported:
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MW-71-20211611
21K0284-06 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/16/2021 11:40

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 21:31

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0731 Sample Size: 25 mL
 Prepared: 11/30/2021 Final Volume: 25 mL

Extract ID: 21K0284-06 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	4.36	ug/L	
Chromium	7440-47-3	1	0.260	0.500	0.309	ug/L	J
Iron	7439-89-6	1	18.2	36.0	8690	ug/L	
Lead	7439-92-1	1	0.0513	0.100	0.0690	ug/L	J
Manganese	7439-96-5	1	0.142	0.500	261	ug/L	
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	1.29	ug/L	


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 Project Manager: Meg Strong

Reported:
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MW-71-20211611
21K0284-06 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/16/2021 11:40

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 21:31

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0731 Sample Size: 25 mL
 Prepared: 11/30/2021 Final Volume: 25 mL

Extract ID: 21K0284-06 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	4.08	ug/L	
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	0.376	ug/L	
Copper	7440-50-8	1	0.173	0.500	1.60	ug/L	
Nickel	7440-02-0	1	0.0792	0.500	0.218	ug/L	J
Selenium	7782-49-2	1	0.179	0.500	ND	ug/L	U
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U


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Reported:
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MW-71-20211611
21K0284-06 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/16/2021 11:40

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 15:41

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0284-06 C

Preparation Batch: BJK0611

Sample Size: 20 mL

Prepared: 11/23/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-71-20211611
21K0284-07 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B

Sampled: 11/16/2021 11:40

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/24/2021 03:40

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0284-07 A 02
	Preparation Batch: BJK0487	Filtration Batch: BJK0466
	Prepared: 11/18/2021	Filtration Date: 11/17/2021 16:21
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Iron, Dissolved	7439-89-6	5	91.0	180	6820	ug/L	D
Manganese, Dissolved	7439-96-5	5	0.710	2.50	311	ug/L	D

Instrument: ICPMS2 Analyst: SKD

Analyzed: 11/22/2021 23:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0284-07 A 02
	Preparation Batch: BJK0487	Filtration Batch: BJK0466
	Prepared: 11/18/2021	Filtration Date: 11/17/2021 16:21
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Barium, Dissolved	7440-39-3	1	0.114	0.500	1.13	ug/L	
Chromium, Dissolved	7440-47-3	1	0.260	0.500	ND	ug/L	U
Lead, Dissolved	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Silver, Dissolved	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium, Dissolved	7440-62-2	1	0.0556	0.200	0.221	ug/L	


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 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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MW-71-20211611
21K0284-07 (Water)
Metals and Metallic Compounds (dissolved)

Method: EPA 6020B UCT-KED

Sampled: 11/16/2021 11:40

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 18:02

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0284-07 A 02
	Preparation Batch: BJK0487	Filtration Batch: BJK0466
	Prepared: 11/18/2021	Filtration Date: 11/17/2021 16:21
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Selenium, Dissolved	7782-49-2	2	0.358	1.00	0.662	ug/L	J, D
Zinc, Dissolved	7440-66-6	2	5.84	12.0	ND	ug/L	U

Instrument: ICPMS2 Analyst: SKD

Analyzed: 11/22/2021 23:13

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix	Extract ID: 21K0284-07 A 02
	Preparation Batch: BJK0487	Filtration Batch: BJK0466
	Prepared: 11/18/2021	Filtration Date: 11/17/2021 16:21
	Sample Size: 25 mL	
	Final Volume: 25 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0373	0.200	2.87	ug/L	
Cadmium, Dissolved	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt, Dissolved	7440-48-4	1	0.0178	0.200	0.305	ug/L	
Copper, Dissolved	7440-50-8	1	0.173	0.500	ND	ug/L	U
Nickel, Dissolved	7440-02-0	1	0.0792	0.500	0.138	ug/L	J



Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

MW-71-20211611

21K0284-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 7470A

Sampled: 11/16/2021 11:40

Instrument: HYDRA Analyst: SKD

Analyzed: 12/02/2021 16:36

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0284-07 A 01

Preparation Batch: BJK0027

Sample Size: 20 mL

Filtration Batch: BJK0466

Prepared: 12/01/2021

Final Volume: 20 mL

Filtration Date: 11/17/2021 16:21

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury, Dissolved	7439-97-6	1	0.000013	0.000100	ND	mg/L	U



Analytical Report

Shannon & Wilson, Inc
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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

EB-2-20211611 21K0284-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 11/16/2021 11:50

Instrument: NT3 Analyst: PKC

Analyzed: 11/17/2021 15:35

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-08 K

Preparation Batch: BJK0451

Sample Size: 10 mL

Prepared: 11/17/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.08	0.20	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.08	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.07	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.08	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.05	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.07	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.05	0.20	0.07	ug/L	J
Tetrachloroethene	127-18-4	1	0.09	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.05	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.14	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.08	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.22	0.60	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				80-129 %	82.9	%	
<i>Surrogate: Toluene-d8</i>				80-120 %	103	%	
<i>Surrogate: 4-Bromofluorobenzene</i>				80-120 %	106	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>				80-120 %	101	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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EB-2-20211611
21K0284-08 (Water)
Volatile Organic Compounds

Method: NWTPHg

Sampled: 11/16/2021 11:50

Instrument: NT3 Analyst: PKC

Analyzed: 11/19/2021 19:25

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)

Extract ID: 21K0284-08 M

Preparation Batch: BJK0547

Sample Size: 10 mL

Prepared: 11/19/2021

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	104	%	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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EB-2-20211611
21K0284-08 (Water)
Volatile Organic Compounds - SIM

Method: EPA 8260D-SIM

Sampled: 11/16/2021 11:50

Instrument: NT7 Analyst: KOTT

Analyzed: 11/26/2021 19:55

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 5030C (Purge and Trap)	Extract ID: 21K0284-08 P
	Preparation Batch: BJK0666	Sample Size: 10 mL
	Prepared: 11/24/2021	Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	5.01	20.0	ND	ng/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>				<i>80-129 %</i>	<i>93.9</i>	<i>%</i>	


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 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
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EB-2-20211611
21K0284-08 (Water)
Semivolatile Organic Compounds

Method: EPA 8270E

Sampled: 11/16/2021 11:50

Instrument: NT10 Analyst: VTS

Analyzed: 12/01/2021 14:51

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0540
 Prepared: 11/23/2021

 Sample Size: 1000 mL
 Final Volume: 1 mL

Extract ID: 21K0284-08 B 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dichlorobenzene	106-46-7	1	0.03	0.2	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.03	0.2	ND	ug/L	U
2,4-Dimethylphenol	105-67-9	1	0.3	1.0	ND	ug/L	U
Benzoic acid	65-85-0	1	0.1	2.0	ND	ug/L	U
N-Nitrosodiphenylamine	86-30-6	1	0.03	0.2	ND	ug/L	U
Pentachlorophenol	87-86-5	1	0.1	1.0	ND	ug/L	U
Di-n-Butylphthalate	84-74-2	1	0.05	0.2	ND	ug/L	U
Butylbenzylphthalate	85-68-7	1	0.07	0.2	ND	ug/L	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	0.2	0.2	ND	ug/L	U

Surrogate: 2-Fluorophenol

30-160 % 42.2 %

Surrogate: Phenol-d5

30-160 % 27.3 %

*

Surrogate: 2-Chlorophenol-d4

30-160 % 80.4 %

Surrogate: 1,2-Dichlorobenzene-d4

30-160 % 70.2 %

Surrogate: Nitrobenzene-d5

30-160 % 78.1 %

Surrogate: 2-Fluorobiphenyl

30-160 % 89.4 %

Surrogate: 2,4,6-Tribromophenol

30-160 % 92.9 %

Surrogate: p-Terphenyl-d14

30-160 % 94.9 % Q



Analytical Report

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Project: Lower Duwamish Q4
Project Number: 21-1-12596-012
Project Manager: Meg Strong

Reported:
03-Dec-2021 19:31

EB-2-20211611 21K0284-08 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM

Sampled: 11/16/2021 11:50

Instrument: NT11 Analyst: VTS

Analyzed: 11/27/2021 10:39

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0539 Prepared: 11/23/2021	Sample Size: 500 mL Final Volume: 0.5 mL	Extract ID: 21K0284-08 F 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0280 Cleaned: 26-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0284-08 F 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Naphthalene	91-20-3	1	0.001	0.010	0.006	ug/L	J
2-Methylnaphthalene	91-57-6	1	0.001	0.010	0.002	ug/L	J
1-Methylnaphthalene	90-12-0	1	0.0009	0.010	0.002	ug/L	J
Acenaphthylene	208-96-8	1	0.002	0.010	ND	ug/L	U
Acenaphthene	83-32-9	1	0.003	0.010	0.008	ug/L	J
Dibenzofuran	132-64-9	1	0.002	0.010	ND	ug/L	U
Fluorene	86-73-7	1	0.002	0.010	ND	ug/L	U
Phenanthrene	85-01-8	1	0.001	0.010	ND	ug/L	U
Anthracene	120-12-7	1	0.001	0.010	ND	ug/L	U
Carbazole	86-74-8	1	0.001	0.010	ND	ug/L	U
Fluoranthene	206-44-0	1	0.002	0.010	ND	ug/L	U
Pyrene	129-00-0	1	0.001	0.010	ND	ug/L	U
Benzo(a)anthracene	56-55-3	1	0.0008	0.010	ND	ug/L	U
Chrysene	218-01-9	1	0.0009	0.010	ND	ug/L	U
Benzo(b)fluoranthene	205-99-2	1	0.0005	0.010	ND	ug/L	U
Benzo(k)fluoranthene	207-08-9	1	0.003	0.010	ND	ug/L	U
Benzo(j)fluoranthene	205-82-3	1	0.002	0.010	ND	ug/L	U
Benzo(a)fluoranthene, Total		1	0.004	0.010	ND	ug/L	U
Benzo(a)pyrene	50-32-8	1	0.002	0.010	ND	ug/L	U
Perylene	1985-5-0	1	0.006	0.010	ND	ug/L	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	0.001	0.010	ND	ug/L	U
Dibenzo(a,h)anthracene	53-70-3	1	0.001	0.010	ND	ug/L	U
Benzo(g,h,i)perylene	191-24-2	1	0.001	0.010	ND	ug/L	U
Surrogate: 2-Methylnaphthalene-d10					42-120 %	89.2 %	
Surrogate: Dibenzo[a,h]anthracene-d14					29-120 %	71.7 %	
Surrogate: Fluoranthene-d10					57-120 %	98.3 %	


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 Seattle WA, 98103-8636

 Project: Lower Duwamish Q4
 Project Number: 21-1-12596-012
 Project Manager: Meg Strong

Reported:
 03-Dec-2021 19:31

EB-2-20211611
21K0284-08 (Water)
Petroleum Hydrocarbons

Method: NWTPH-Dx

Sampled: 11/16/2021 11:50

Instrument: FID4 Analyst: TWC

Analyzed: 11/27/2021 02:33

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: EPA 3510C SepF
 Preparation Batch: BJK0537
 Prepared: 11/22/2021

 Sample Size: 500 mL
 Final Volume: 1 mL

Extract ID: 21K0284-08 D 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			<i>50-150 %</i>	<i>110</i>	<i>%</i>	


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EB-2-20211611
21K0284-08 (Water)
Aroclor PCB

Method: EPA 8082A

Sampled: 11/16/2021 11:50

Instrument: ECD7 Analyst: JGR

Analyzed: 11/30/2021 22:14

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF Preparation Batch: BJK0538 Prepared: 11/23/2021	Sample Size: 1000 mL Final Volume: 0.5 mL	Extract ID: 21K0284-08 A 01
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CJK0302 Cleaned: 29-Nov-2021	Initial Volume: 0.5 mL Final Volume: 0.5 mL	Extract ID: 21K0284-08 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CJK0300 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-08 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CJK0301 Cleaned: 29-Nov-2021	Initial Volume: 0.5 uL Final Volume: 0.5 uL	Extract ID: 21K0284-08 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1221	11104-28-2	1	0.002	0.010	ND	ug/L	U
Aroclor 1232	11141-16-5	1	0.002	0.010	ND	ug/L	U
Aroclor 1242	53469-21-9	1	0.002	0.010	ND	ug/L	U
Aroclor 1248	12672-29-6	1	0.002	0.010	ND	ug/L	U
Aroclor 1254	11097-69-1	1	0.002	0.010	ND	ug/L	U
Aroclor 1260	11096-82-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1262	37324-23-5	1	0.003	0.010	ND	ug/L	U
Aroclor 1268	11100-14-4	1	0.003	0.010	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>				29-120 %	56.5	%	
<i>Surrogate: Tetrachlorometaxylene</i>				32-120 %	77.1	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				29-120 %	55.0	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				32-120 %	76.0	%	


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EB-2-20211611
21K0284-08 (Water)
Metals and Metallic Compounds

Method: EPA 6020B

Sampled: 11/16/2021 11:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 20:00

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0731 Sample Size: 25 mL
 Prepared: 11/30/2021 Final Volume: 25 mL

Extract ID: 21K0284-08 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Barium	7440-39-3	1	0.114	0.500	ND	ug/L	U
Chromium	7440-47-3	1	0.260	0.500	ND	ug/L	U
Iron	7439-89-6	1	18.2	36.0	ND	ug/L	U
Lead	7439-92-1	1	0.0513	0.100	ND	ug/L	U
Manganese	7439-96-5	1	0.142	0.500	ND	ug/L	U
Silver	7440-22-4	1	0.0220	0.200	ND	ug/L	U
Vanadium	7440-62-2	1	0.0556	0.200	ND	ug/L	U


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EB-2-20211611
21K0284-08 (Water)
Metals and Metallic Compounds

Method: EPA 6020B UCT-KED

Sampled: 11/16/2021 11:50

Instrument: ICPMS1 Analyst: MCB

Analyzed: 11/30/2021 20:00

Analysis by: Analytical Resources, LLC

 Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
 Preparation Batch: BJK0731 Sample Size: 25 mL
 Prepared: 11/30/2021 Final Volume: 25 mL

Extract ID: 21K0284-08 C 02

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Arsenic	7440-38-2	1	0.0373	0.200	ND	ug/L	U
Cadmium	7440-43-9	1	0.0300	0.100	ND	ug/L	U
Cobalt	7440-48-4	1	0.0178	0.200	ND	ug/L	U
Copper	7440-50-8	1	0.173	0.500	0.206	ug/L	J
Nickel	7440-02-0	1	0.0792	0.500	ND	ug/L	U
Selenium	7782-49-2	1	0.179	0.500	0.300	ug/L	J
Zinc	7440-66-6	1	2.92	6.00	ND	ug/L	U


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EB-2-20211611
21K0284-08 (Water)
Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 11/16/2021 11:50

Instrument: HYDRA Analyst: ML

Analyzed: 11/23/2021 15:25

Analysis by: Analytical Resources, LLC

Sample Preparation:

Preparation Method: TWM EPA 7470A

Extract ID: 21K0284-08 C

Preparation Batch: BJK0611

Sample Size: 20 mL

Prepared: 11/23/2021

Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000013	0.000100	ND	mg/L	U